

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. 111

SOUTHERN CALIFORNIA EDISON COMPANY, ET AL. pursuant to 10 CFR 50.90, hereby
submit Amendment Application No. 111.

This amendment application consists of Proposed Technical Specification
Change No. NPF-10-356 to Facility Operating License NPF-10. Proposed
Technical Specification Change No. NPF-10-356 is a request to revise Technical
Specification 3/4.3.4, "Turbine Overspeed Protection." The Proposed Change
would revise Surveillance Requirements 4.3.4.a and 4.3.4.b to require one
monthly test of the turbine valves to demonstrate Turbine Overspeed Protection
System operability.

9210220074 921016
PDR ADOCK 05000361
P PDR

Subscribed on this 16th day of October, 1992.

Respectfully submitted,

SOUTHERN CALIFORNIA EDISON COMPANY

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

State of California

County of Orange

On 10-16-92 before me, Lucy M. Carter, personally appeared Harold B. Ray, personally known to me (or proved to me on the basis of satisfactory evidence) to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

WITNESS my hand and official seal.

Signature Lucy M. Carter



James A. Beoletto
Attorney for Southern
California Edison Company

By: James A. Beoletto

James A. Beoletto

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

Application of SOUTHERN CALIFORNIA)	
EDISON COMPANY, <u>ET AL.</u> for a Class 103)	Docket No. 50-362
License to Acquire, Possess, and Use)	
a Utilization Facility as Part of)	Amendment Application
Unit No. 3 of the San Onofre Nuclear)	No. 95.
Generating Station)	

SOUTHERN CALIFORNIA EDISON COMPANY, ET AL. pursuant to 10 CFR 50.90, hereby submit Amendment Application No. 95.

This amendment application consists of Proposed Technical Specification Change No. NPF-15-356 to Facility Operating License NPF-15. Proposed Technical Specification Change No. NPF-15-356 is a request to revise Technical Specification 3/4.3.4, "Turbine Overspeed Protection." The Proposed Change would revise Surveillance Requirements 4.3.4.a and 4.3.4.b to require one monthly test of the turbine valves to demonstrate Turbine Overspeed Protection System operability.

Subscribed on this 16th day of October, 1992.

Respectfully submitted,

SOUTHERN CALIFORNIA EDISON COMPANY

By:

Harold B. Ray
Harold B. Ray
Senior Vice President

State of California

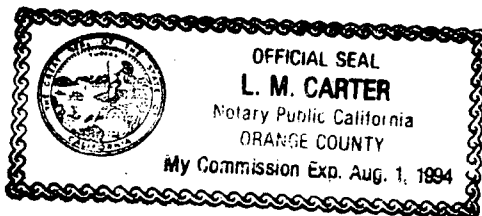
County of Orange

On 10-16-92 before me, Lucy M. Carter, personally appeared Harold B. Ray, personally known to me (or proved to me on the basis of satisfactory evidence) to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

WITNESS my hand and official seal.

Signature

Lucy M. Carter



James A. Beoletto
Attorney for Southern
California Edison Company

By:

James A. Beoletto
James A. Beoletto

DESCRIPTION AND SAFETY ANALYSIS
OF PROPOSED CHANGE NPF-10/15-356

This is a request to revise Surveillance Requirements 4.3.4.a and 4.3.4.b of Technical Specification 3/4.3.4, "Turbine Overspeed Protection," of the San Onofre Nuclear Generating Station (SONGS) Units 2 and 3 Technical Specifications.

Existing SONGS Specifications:

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

Proposed SONGS Specifications:

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

Summary of Changes:

The proposed change will revise Surveillance Requirements 4.3.4.a and 4.3.4.b of SONGS Technical Specification (TS) 3/4.3.4, "Turbine Overspeed Protection". TS 3/4.3.4 identifies turbine overspeed protection system operability requirements, actions to initiate should the overspeed protection system be inoperable, and periodic surveillance tests to demonstrate turbine overspeed protection system operability.

Surveillance Requirement (SR) 4.3.4.a and SR 4.3.4.b, respectively, require tests of the high pressure main steam stop and control valves, and low pressure reheat stop and intercept valves be performed to determine Turbine Overspeed Protection System operability on a weekly and monthly basis. The monthly surveillance requires direct observation of the movement of each valve. The proposed change would revise the surveillance requirements to allow one monthly test to satisfy the surveillance.

On an industry-wide basis, turbine valve testing has been found to be a significant contributor to reactor trip. However, no trips due to turbine valve testing have been experienced at SONGS Units 2 and 3. To perform the test, the Steam Bypass Control System is used to bypass the steam to the condenser. Performance of the surveillance is hard on plant equipment, causing additional wear to the valves and stress to the steam system.

System Description

The turbine-generator manufactured by GEC is a tandem-compound (single shaft) impulse-reaction reheat turbine consisting of one double-flow high pressure turbine and three double-flow low pressure turbines. The rotational speed is 1800 revolutions per minute and the design net generator output is 1181 megawatts electric. The turbine generators are arranged in a non-peninsular orientation relative to the Containment buildings for SONGS Units 2 and 3.

Each turbine is provided with on-load testing capability for periodic testing of all turbine steam control valves and the associated electrohydraulic unitized actuators, with provisions for on-load testing of the normal overspeed and emergency overspeed protection channels. An alarm module is provided for each turbine to monitor the operation of the electrohydraulic control system. Instrumentation is provided to continuously monitor and alarm the operation of each turbine generator during startup, shutdown and operation.

Discussion:

TS 3/4.3.4, "Turbine Overspeed Protection," identifies turbine overspeed protection system operability requirements, actions to initiate should the overspeed protection system be inoperable, and periodic surveillance tests to demonstrate turbine overspeed protection system operability. Turbine speed control valve operability is periodically verified by SR 4.3.4.a. and SR 4.3.4.b which require tests of the high pressure main steam stop and control valves, and low pressure reheat stop and intercept valves. SR 4.3.4.a requires cycling the four sets of valves through at least one complete cycle from the running position (i.e., from the normal position of these valves when the plant is operating) once per 7 days. SR 4.3.4.b requires direct observation of the movement of each valve through one complete cycle from the running position once per 31 days.

The objective of the surveillance requirements is to assure the valves will shut upon demand, hence minimizing the probability of generating destructive missiles resulting from turbine overspeed that could damage safety related equipment and prevent safe shutdown of the plant. The turbine control and overspeed protection system is designed to control turbine action under all normal and abnormal conditions to assure that a turbine trip from full load will not cause the turbine to overspeed beyond acceptable limits.

The surveillance testing requires moving each of the turbine valves through one complete cycle from the running position. The test verifies freedom of movement of valve components. That is, it verifies that nothing inhibits the valve from closing. The seven day test is performed by an operator in the control room. The 31 day test is performed by a control room operator with an observer at the valve.

The seven day test interval was developed for fossil units and carried over to early nuclear units due to similarity in design, and the lack of data on early nuclear units. However, fossil units produce steam with much greater particulate (impurities) content than is permitted in nuclear units. These impurities require more frequent valve surveillance to ensure reliable operation. Fossil units and early nuclear units also utilized phosphate chemistry in their condensate. The phosphate-based chemistry contributed to valve inoperability. SONGS Units 2 and 3 use exclusively all-volatile chemistry (i.e., hydrazine and ammonia). All-volatile treatment plant chemistry ensures deposits within the valves do not occur that would prohibit the valves from opening or closing.

Performing these surveillances has caused a significant number of reactor trips on an industry wide basis. However, no trips due to turbine valve testing have

been experienced at SONGS Units 2 and 3. The surveillance also results in additional wear to the valves, and stress to the steam system. In addition, while the test is being performed, in order to avoid a reactor trip, the steam flow to the turbine must be reduced. This is accomplished by dumping steam to the condenser, which could cause vibration of the condenser tubes. The industry has observed that this test is hard on the steam system, potentially causing relief valves to lift and adding thermal and mechanical stresses to the piping.

Probability of Missile Generation Due to Turbine Failure, P1

NRC acceptance criteria relating to turbine missiles has changed substantially since the issuance of the SER for SONGS Units 2 and 3. The emphasis has been shifted from calculation of the frequency of turbine missile damage (P4), to the reduction of turbine missile genesis (P1). In an analysis performed by GEC, the turbine manufacturer, P1 is calculated as 6.7×10^{-8} for the weekly testing schedule and 2.7×10^{-7} for the monthly testing schedule. For plants with turbine orientation similar to SONGS, the NRC established criteria is less than or equal to 1×10^{-5} events per year.

GEC Recommendations

GEC Alsthom International, the turbine manufacturer for SONGS Units 2 and 3, has concurred with the proposed change to SR 4.3.4. The GEC review indicated that changing the testing schedule to once every month will provide sufficient safeguards to ensure turbine overspeed operability. GEC considers adoption of monthly on-load testing to be a reasonable compromise between the maximum assurance provided by frequent testing and the operational upsets which may occur during the course of performing the routine on-load tests.

Conclusion

SCE's proposal to extend the seven day surveillance to monthly has shown that plant safety will not be jeopardized since P1 will remain within current NRC acceptance criteria related to turbine missiles.

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

As part of the testing for the Turbine Overspeed Protection System, the turbine stop valves, control valves, reheat stop valves, and reheat intercept valves are required to be cycled through at least one complete cycle from the running position. The surveillance tests are currently performed at power every 7 days and every 31

days. SR 4.3.4 demonstrates the valves are free to close, thus satisfying the valves safety function--to ensure the valves close, precluding turbine missile generation.

Turbine valve testing has been found to be a significant contributor to reactor trip and subsequently unnecessary challenges to plant systems and personnel on an industry-wide basis. Testing at power is generally a concern and should be minimized when possible. In addition, turbine valve testing is hard on the equipment, causing wear to the valves and thermal cycling and stress to the steam system.

The proposed change would revise the surveillance to specify one test to be performed at least once per 31 days. Although there would be a slight increase in the probability of missile generation from turbine overspeed as a result of the decrease in the valve testing frequency, the increase is not significant. GEC, the turbine manufacturer, has calculated the probability of turbine missile genesis (P1) to be 6.7×10^{-8} for the weekly testing schedule and 2.7×10^{-7} for the monthly testing schedule. Therefore, the proposed change in testing frequency would not jeopardize plant safety as the probability of turbine missile genesis resulting from an overspeed condition is well within the current NRC acceptance criteria of 1×10^{-5} events per year. The consequence of a turbine generated missile are unaffected by this change.

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 Turbine Overspeed Protection System will continue to perform its design function to protect the turbine from excessive overspeed. In addition, the type of tests required by SR 4.3.4 will not be modified as a result of the proposed change. The proposed surveillance does not introduce a new or different kind of accident because the test, acceptance criteria, and inspection methods are unchanged. 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 revise SR 4.3.4.a and SR 4.3.4.b to permit one monthly test to satisfy both requirements. The SONGS turbine manufacturer has concurred with this proposal. Based on reanalysis, the revised PI has been found to be within NRC acceptance criteria. The actual tests to demonstrate turbine overspeed protection system operability would not be affected and would be conducted in the same manner. 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; 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.