Nuclear Operating Company
South Texas Project Electric Generating Station P.O. Box 289 Wadsworth, Texas 77483

May 29, 2003
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File No.: G25
10CFR50.55a

U. S. Nuclear Regulatory Commission
Attention: Document Control Desk
One White Flint North
11555 Rockville Pike
Rockville, MD 20852

South Texas Project
Units 1 and 2
Docket Nos. STN 50-498, STN 50-499
Request for Approval of an Alternative Approach for
Containment Spray System Surveillances (RR-ENG-2-28)

Reference: Letter, J. J. Sheppard to NRC Document Control Desk, "Proposed Amendment to Technical Specification 3/4.6.2, Depressurization and Cooling Systems," dated May 14, 2003 (NOC-AE-02001396)

In accordance with the provisions of 10CFR50.55a(a)(3)(ii), the South Texas Project requests approval of an alternative to ASME Section XI, paragraph IWC-5222(d). The Code currently specifies that for open-ended portions of discharge lines beyond the last shutoff valve in non-closed systems (e.g., containment spray header), demonstration of an open flow path test shall be performed in lieu of the system hydrostatic test. The Containment Spray System demonstration is currently required to be performed each test interval (10 years).

Compliance with the requirement as written would result in hardship without a compensating increase in the level of quality and safety. The requested change proposes that verification of spray nozzle operability be required only after spray ring header maintenance activities that could result in nozzle obstruction.

The next surveillance is required to be performed during refueling outages beginning in March 2004. The South Texas Project requests Nuclear Regulatory Commission approval of this proposed change by December 31, 2003, to facilitate scheduling for subsequent inspections of the Containment Spray System. Although this request is neither exigent nor an emergency, prompt review by the Nuclear Regulatory Commission is requested.

The South Texas Project submits this proposed alternative in conjunction with a proposed license amendment (referenced above) which similarly removes the ten-year surveillance interval requirement from Technical Specification surveillance requirement 4.6.2.1.d.

If there are any questions, please contact either Mr. P. L. Walker at (361) 972-8392 or me at (361) 972-7902.

T. J. Jordan
Vice President,
Engineering and Technical Services

PLW

Attachments: Request for Approval of an Alternative Approach for Containment Spray System Surveillances (RR-ENG-2-28)

A047

cc:
(paper copy)

Ellis W. Merschoff
Regional Administrator, Region IV
U.S. Nuclear Regulatory Commission
611 Ryan Plaza Drive, Suite 400
Arlington, Texas 76011-8064

U. S. Nuclear Regulatory Commission
Attention: Document Control Desk
One White Flint North
11555 Rockville Pike
Rockville, MD 20852

Richard A. Ratliff
Bureau of Radiation Control
Texas Department of Health
1100 West 49th Street
Austin, TX 78756-3189

Cornelius F. O'Keefe
U. S. Nuclear Regulatory Commission
P. O. Box 289, Mail Code: MN116
Wadsworth, TX 77483

C. M. Canady
City of Austin
Electric Utility Department
721 Barton Springs Road
Austin, TX 78704

(electronic copy)

A. H. Gutterman, Esquire
Morgan, Lewis & Bockius LLP

L. D. Blaylock
City Public Service

Mohan C. Thadani
U. S. Nuclear Regulatory Commission

R. L. Balcom
Texas Genco, LP

A. Ramirez
City of Austin

C. A. Johnson
AEP Texas Central Company

Jon C. Wood
Matthews & Branscomb

ATTACHMENT

SOUTH TEXAS PROJECT
UNITS 1 AND 2
REQUEST FOR APPROVAL OF AN ALTERNATIVE APPROACH FOR
CONTAINMENT SPRAY SYSTEM SURVEILLANCES (RR-ENG-2-28)

SOUTH TEXAS PROJECT
UNITS 1 AND 2
REQUEST FOR APPROVAL OF AN ALTERNATIVE APPROACH FOR CONTAINMENT SPRAY SYSTEM SURVEILLANCES (RR-ENG-2-28)

1. AFFECTED COMPONENTS

(a) Component: Containment Spray System

(b) Function: Maintain Reactor Containment Building pressure within design limits, reduce the quantity of airborne iodine, and establish the sump pH to retain elemental iodine.

(c) Class: ASME Code Class 3

2. APPLICABLE CODE

ASME Boiler & Pressure Vessel Code, Section XI, 1989 Edition

3. CODE REQUIREMENTS FROM WHICH RELIEF IS REQUESTED

IWC-5000, "System Pressure Test," describes the test criteria to be applied to the Containment Spray System. This submittal addresses the following subparagraph:

IWC-5222, "System Hydrostatic Test"

(d) For open ended portions of discharge lines beyond the last shutoff valve in nonclosed systems (e.g., containment spray header), demonstration of an open flow path test shall be performed in lieu of the system hydrostatic test.

Pursuant to ASME Section XI Table IWC-2500-1, the test is to be conducted at least once in each test interval (ten-year period).

4. BASIS FOR REQUEST

Reduced testing is justified where operating experience has shown that routinely passing a surveillance test performed at a specified interval has no apparent connection to overall component reliability. In this case, routine surveillance testing at the specified interval is not connected to any activity that may initiate reduced component reliability, and therefore is of limited value in ensuring component reliability. Therefore, the proposed change is not significant from a reliability standpoint.

The current surveillance test may affect refueling activities in the reactor containment building, presents a personal safety risk for the individuals required to access the top of containment to check the nozzle air flow, and is expensive to implement. The effort and potential consequences associated with performing this test are not commensurate with the safety benefit unless there has been an activity that could result in nozzle blockage due to foreign material.

5. PROPOSED ALTERNATIVE

Pursuant to 10CFR50.55a(a)(3)(ii), the South Texas Project requests approval to apply an alternative inspection requirement from the criteria specified in ASME Section XI Table IWC-2500-1 and Subsection IWC-5222(d) for demonstrating that the Containment Spray System has an open flow path. The proposed alternative approach will demonstrate the Containment Spray System nozzles are operable following maintenance activities that could result in spray nozzle blockage.

6. BASIS FOR USE

6.1 System Description

The Containment Spray System is an Engineered Safety Feature used in response to a postulated Loss of Coolant Accident (LOCA). In response to a LOCA, the Containment Spray System is designed to:

- Maintain Reactor Containment Building pressure within design limits.
- Reduce the quantity of airborne iodine.
- Establish the sump pH for retention of elemental iodine.

These functions are performed by subcooled water sprayed into the Containment atmosphere through nozzles from spray headers located in the Containment dome. The large ratio of spray drop surface-to-Containment volume enables the spray to effectively remove fission products from the Containment atmosphere. The major benefit of the Containment Spray System is removal of iodine from the Containment atmosphere. (Radioiodine in its various forms is the fission product of primary concern in evaluating the consequences of a LOCA.)

The Containment Spray System consists of three independent and identical trains. Two of the three trains are assumed to be available to provide 100 percent of the required water flow to the spray headers mounted in the Containment dome.

- **Spray Headers**

  Four concentric spray headers are located in the domed roof of the Containment building, providing 360-degree coverage over the Containment volume. The spray headers are located as high as possible without interruption of the spray pattern by impingement on the inside of the Containment dome. Piping to the spray headers assures delivery of 100 percent of the required spray flow assuming any single active failure.

- **Spray Nozzles**

  The Containment Spray System nozzles are distributed on four concentric spray ring headers located in the uppermost part of the Containment. The ring headers have 12, 50, 60, and 120 nozzles, respectively.

Containment spray nozzles are SPRACO Type-1713A. The spray nozzles are hollow-cone, with a 3/8-inch-diameter orifice, and are fabricated from stainless steel. These nozzles have a swirl chamber design (referred to as "ramp bottom" by SPRACO) with no internal parts, such as swirl vanes, that may become clogged. The 3/8-inch nozzle discharge orifice is sufficiently large to preclude clogging by particles that pass through the 1/4-inch mesh of the fine sump screens.

6.2 Nozzle Test Schedule

The Containment Spray System nozzles were initially tested at five-year intervals. As approved by the Nuclear Regulatory Commission in South Texas Project license amendments 91 (Unit 1) and 84 (Unit 2) dated March 11, 1998, the surveillance interval is currently ten years.

6.3 Results from Previous Tests

The Containment Spray System nozzles have been tested to confirm that there are no obstructions. Airflow tests were conducted as part of pre-operational testing and after the first five years of operation.

Test	Unit 1	Unit 2
Pre-Operational	1986	1987
TS Surveillance	1992	1993

The results of each test demonstrated unobstructed flow through each nozzle. These tests confirmed that the nozzles are free from construction debris, and also free from obstructions that could have occurred following startup and operation of the units. Also, the tests show that the spray nozzles did not become obstructed over a period of normal reactor operation.

6.4 Corrosion

The Containment Spray System header and nozzles are passive devices that are not normally exposed to fluids or debris. The South Texas Project spray ring headers are maintained dry. Standing water is present in system piping up to the 43-foot elevation compared to the 228-foot peak elevation inside containment.

Formation of significant corrosion products is unlikely because the components are stainless steel. Conditions for stainless steel corrosion, i.e., stress, temperature, and chlorides, are not present. Therefore, the nozzles are unlikely to become obstructed due to corrosion.

6.5 Maintenance

A review of the maintenance and modification history since the last airflow test indicates that work orders and modifications have been applied to Containment Spray isolation valves and pumps. Modifications associated with the valves were for operator adjustments and would not have affected system cleanliness. Cleanliness control practices, including post-work inspections, ensure system cleanliness requirements are met. There has been no maintenance or modification of the nozzles or spray rings.

6.6 Applicable Regulatory Requirements

NUREG-1366, "Improvements to Technical Specification Requirements," is a review of industry operating history to determine the cause of problems discovered when performing this surveillance. In all cases, the problems discovered were related to construction, and not the result of normal operation.

Generic Letter 93-05, "Line-Item Technical Specifications Improvements to Reduce Surveillance Requirements for Testing During Power Operation," dated March 8, 1993, described a problem that was caused during operation because sodium silicate, a coating material applied to the Containment Spray System carbon steel piping, clogged seven nozzles. The South Texas Project Containment Spray System piping and nozzles are stainless steel and are not coated. Therefore, that concern is not applicable to the South Texas Project.

The Containment Spray system nozzles for both South Texas Project units have been tested satisfactorily twice since completion of construction, demonstrating that the construction problems identified in NUREG-1366 have not occurred at the South Texas Project.

6.7 Foreign Material Exclusion

The South Texas Project Foreign Material Exclusion Program describes the measures to be taken to ensure foreign material is not introduced into a component or system, or to recover if foreign material is introduced. The Foreign Material Exclusion program requires that an inspection be performed when closing a system or component to ensure that all foreign material is removed. This requirement applies to all work activities and inspection activities on plant systems and components performed by any group at the South Texas Project. If foreign material exclusion is not maintained as required, a Condition Report is to be initiated requiring assessment of the circumstances and implementation of appropriate corrective actions to ensure the spray nozzles continue to be operable.

When maintenance requires a breach of a fluid system or associated component integrity, implementation of procedural guidelines for station housekeeping will prevent inadvertent introduction of foreign material into the system/component. Any fluid system/component breach is to be covered when access for maintenance or inspection is not required.

Due to the spray header's location at the top of the containment, introduction of foreign material into the spray header is unlikely. Foreign material introduced as a result of maintenance is the most likely source of an obstruction; therefore, verification following such maintenance would confirm the nozzles are not subject to blockage. Consequently, the potential for unidentified nozzle obstruction is very low.

In general, once tested after construction, containment spray systems have not been subject to blockage. Routine maintenance activities with effective application of foreign material exclusion controls should not require subsequent inspection or testing of the spray nozzles. Normal plant operation and maintenance practices are not expected to trigger this surveillance requirement.

6.8 Risk Analysis

Accident analyses are based on two of the three Containment Spray trains operating. Two operable Containment Spray pumps assure that the pressure across the upper spray ring nozzles is adequate to provide the design flowrate. The calculated spray coverage inside the containment ensures that after a design-basis accident the offsite dose is within 10CFR100 limits and the 30-day control room dose is within design guidelines. However, these criteria are not applicable to the Probabilistic Safety Assessment, and neither is the conservatism applied to the design-basis analysis. The best estimate one-pump flowrate is nearly as great as the design two-pump flow rate, and one pump can provide adequate pressure across the lower ring nozzles.

The Probabilistic Safety Assessment does not address reduction of containment spray capability as a result of nozzle blockage.

6.9 Summary

Reduced testing is justified where operating experience has shown that routinely

passing a surveillance test performed at a specified interval has no apparent connection to overall component reliability. In this case, routine surveillance testing at the specified frequency is not connected to any activity that may initiate reduced component reliability, and therefore is of limited value in ensuring component reliability. Therefore, the proposed change is not significant from a reliability standpoint.

The surveillance affects refueling activities in the reactor containment building, presents a personal safety risk for the individuals required to access the top of containment to check the nozzle air flow, and is expensive to implement. The cost associated with performing this test is not commensurate with the safety benefit unless there has been an activity that could result in nozzle blockage due to foreign material. Performing the open flow test of IWC-5222(d) on an as-needed basis, instead of once in each test interval (10-year period), will not decrease the level of quality and safety.

7. DURATION OF PROPOSED ALTERNATIVE

The South Texas Project requests Nuclear Regulatory Commission approval by December 31, 2003. Implementation of the proposed change will require procedure changes and rescheduling of affected surveillances. Approval by that date is consistent with the requested approval schedule for the companion Technical Specification change referenced previously. The approved alternative will be applicable to the current 10-year intervals ending September 24, 2010 (Unit 1) and October 18, 2010 (Unit 2).