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

August 31, 2000
NOC-AE-000692
File No.: G21.02
10CFR50, Appendix J
10CFR50.90

U. S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, DC 20555-0001

South Texas Project
Unit 2
Docket No. STN 50-499
Proposed Amendment to Technical Specification 6.8.3.j for a One-time
Change in 10CFR50 Appendix J Integrated Leakage Rate Test Interval

Reference: "Letter of Intent to Request an Exemption from 10CFR50, Appendix J, for Type A Leakage Testing," J. J. Sheppard to NRC Document Control Desk, dated January 24, 2000 (NOC-AE-000721)

Pursuant to 10CFR50.90, the South Texas Project requests Nuclear Regulatory Commission review and approval of a proposed amendment to the Technical Specifications for Unit 2. This amendment would provide a one-time interval extension for the Unit 2 Type A test (containment Integrated Leakage Rate Test) from the currently scheduled March 2001 (2RE08) (nine years, six months) to no later than April 2004 (2RE10) (twelve years, seven months).

In the submittal referenced above, the South Texas Project submitted a Letter of Intent to request exemption for Unit 1 and Unit 2 from performing integrated leakage rate tests. Nuclear Regulatory Commission reviewers responded that a rule change to 10CFR50, Appendix J, would be more appropriate. Therefore, the purpose of the requested extension is to obtain sufficient time for initiation and approval of a rule change that would enable the South Texas Project to no longer be required to perform integrated leakage rate testing.

The satisfactory results from previous integrated leakage rate tests support deferral of the 2RE08 test. The South Texas Project will achieve savings in dose, expenses, and schedule by deferring the Unit 2 Type A test one time in expectation of an approved rule change to Appendix J.

This request is not made with a risk-informed basis as described in Regulatory Guide 1.174, "An Approach for Using Probabilistic Risk Assessment in Risk-Informed Decisions on Plant-Specific Changes to the Current Licensing Basis." Although probabilistic risk assessment is incorporated, evaluation of the proposed change is primarily deterministic.

The Unit 2 reactor containment building will continue to be inspected under the requirements of ASME Section XI Subsections IWE and IWL. The existing Type B and C testing programs are not being modified by this request.

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The South Texas Project has reviewed the attached proposed amendment pursuant to 10CFR50.92 and determined that it does not involve a significant hazards consideration. In addition, there is no significant increase in the amounts of any effluents that may be released offsite, and there is no significant increase in individual or cumulative occupational radiation exposure. Consequently, the proposed amendment satisfies the criteria of 10CFR51.22(c)(9) for categorical exclusion from the requirement for an environmental assessment.

The South Texas Project Plant Operations Review Committee has reviewed the proposed amendment and recommended it for approval. The South Texas Project Nuclear Safety Review Board has reviewed and approved the proposed change.

The required affidavit, along with a Safety Evaluation and No Significant Hazards Consideration Determination associated with the proposed change, and the marked-up proposed replacement pages of the Technical Specifications are included as attachments to this letter.

In accordance with 10CFR50.91(b), the South Texas Project is providing the State of Texas with a copy of this proposed amendment.

The South Texas Project requests that the effective date of this amendment be the date of approval, but not later than November 30, 2000, in order to facilitate scheduling for the outage in March 2001. Although this request is neither exigent nor an emergency, prompt review by the Nuclear Regulatory Commission is requested.

If there are any questions, please contact either Mr. P. L. Walker at (361) 972-8392 or me at (361) 972-8757.

J. J. Sheppard
Vice President,
Engineering and Technical Services

PLW

Attachments: Affidavit
Safety Evaluation and Statement of No Significant Hazards Consideration
Proposed Technical Specification Changes

cc:

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U. S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, D.C. 20555-0001

UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

In the Matter of	)		
	)		
	)		
STP Nuclear Operating Company	)	Docket No.	STN 50-499
	)		
South Texas Project Unit 2			
	)		

AFFIDAVIT

I, J. J. Sheppard, being duly sworn, hereby depose and say that I am Vice President, Engineering and Technical Services, of STP Nuclear Operating Company; that I am duly authorized to sign and file with the Nuclear Regulatory Commission the attached Technical Specification amendment request; that I am familiar with the content thereof; and that the matters set forth therein are true and correct to the best of my knowledge and belief.

J. J. Sheppard
Vice President,
Engineering and Technical Services

STATE OF TEXAS)
)
COUNTY OF MATAGORDA)

Subscribed and sworn to before me, a Notary Public in and for the State of Texas, this 31st day of August, 2000.

LOIS J. MILLS
Notary Public, State of Texas
My Commission Expires
JULY 27, 2003

Lois J. Mills
Notary Public in and for the State of Texas

ATTACHMENT 1

PROPOSED AMENDMENT TO TECHNICAL SPECIFICATION 6.8.3.J FOR A ONE-TIME CHANGE IN 10CFR50 APPENDIX J INTEGRATED LEAKAGE RATE TEST INTERVAL

SOUTH TEXAS PROJECT
UNIT 2
PROPOSED AMENDMENT TO TECHNICAL SPECIFICATION 6.8.3.J FOR A ONE-TIME CHANGE IN 10CFR50 APPENDIX J INTEGRATED LEAKAGE RATE TEST INTERVAL

1.0 Background

10CFR50 Appendix J specifies the leak-rate test requirements for primary reactor containments. The test requirements ensure that: (a) leakage through containment or systems and components penetrating containment does not exceed allowable leakage rates specified in the Technical Specifications; and (b) integrity of the containment structure is maintained during its service life. The South Texas Project has adopted Option B of Appendix J, which would require that Integrated Leakage Rate Testing be performed at approximately ten-year intervals.

The existing Appendix J Type B and Type C testing programs are not being modified by this request. However, the South Texas Project has requested exemption of low safety/risk significant and non-risk significant components from special treatment 10CFR50 requirements in, "Revised Request for Exemption to Exclude Certain Components From The Scope of Special Treatment Requirements Required by Regulations," dated August 31, 2000 (NOC-AE-00000918). Specifically, local leakage rate testing (Type C) of low safety significant and non-risk significant isolation valves would no longer be required.

2.0 Summary

Pursuant to 10CFR50.90, the South Texas Project requests a one-time amendment to the Technical Specification requirements for performing an Integrated Leakage Rate Test (Type A test) of the Unit 2 reactor containment building. The proposed Unit 2 amendment would allow for a one-time extension of the interval between the second and third Type A tests. The proposed interval would extend to no later than April 2004 (twelve years, seven months) instead of March 2001 (nine years, six months). The extension would allow the next Unit 2 Type A Integrated Leakage Rate Test to be performed during the tenth refueling outage (April 2004) instead of the eighth refueling outage (March 2001) as currently scheduled. The deferral is expected to allow sufficient time for the South Texas Project to obtain a rule change in 10CFR50 Appendix J requirements.

This one-time extension request is supported by the containment building construction characteristics and previous test history. This change does not affect any accident parameters discussed in the South Texas Project Updated Final Safety Analysis Report. Extending the schedule will not cause a significant change in risk, nor cause NRC Safety Goals to be exceeded. There is no adverse impact on the health and safety of the public.

3.0 Description of the Proposed Change

Technical Specification Section 6.8.3.j requires the following:

> A program shall be established to implement the leakage rate testing of the primary containment as required by 10 CFR 50.54(o) and 10 CFR Part 50, Appendix J, Option B, as modified by approved exemptions. This program shall be in accordance with the guidelines contained in Regulatory Guide 1.163, "Performance-Based Containment Leak-Testing Program", dated September 1995.

Option B of Appendix J identifies the performance-based requirements and criteria for preoperational containment integrity and subsequent periodic leakage-rate testing. Option B invokes Regulatory Guide 1.163, "Performance-Based Containment Leak-Test Program." NEI 94-01, Revision 0, "Industry Guideline for Implementing Performance-Based Option of 10 CFR 50, Appendix J," dated July 26, 1995, and prepared by the Nuclear Energy Institute, provides methods acceptable to the NRC staff for complying with the provisions of Option B as described in Regulatory Guide 1.163. NEI 94-01 includes a criterion that Option B Type A testing shall be performed at a frequency of at least once per 10 years.

The approved one-time deferral of the Unit 2 2RE08 Integrated Leakage Rate Test will be documented with the following addition to Technical Specification 6.8.3.j:

> Performance of the Unit 2 test has been deferred from March 2001 to no later than April 2004.

4.0 Safety Evaluation

The purpose of Appendix J is to ensure that: (a) leakage through the primary reactor containment and systems and components penetrating primary containment does not exceed allowable leakage rate values as specified in the technical specifications or associated bases; and (b) periodic surveillance of reactor containment penetrations and isolation valves is performed so that proper maintenance and repairs are made during the service life of the containment, and of those systems and components penetrating primary containment. Previous Type A tests confirmed that the South Texas Project reactor containment structures meet acceptance requirements for leakage rates. However, these requirements can be fulfilled without conducting Type A testing by maintaining the good material condition of the containment, and performing inspections in accordance with ASME Section XI, Subsections IWE and IWL. Type B and Type C testing will continue as required for applicable components.

4.1 Potential Containment Leakage Sources

Factors affecting leak tightness of containment may be categorized as: 1) active components required to be leak-rate tested by Type B and C tests; and 2) passive components which constitute the containment structure and are tested during the Type A test.

4.1.1 Active Components

The purpose of containment leak testing is to detect any containment leakage resulting from active or passive failures in the containment isolation boundaries before an accident occurs. The major containment leakage paths include:

- **Penetration Seal Leakage:** Air lock door seals; doors with resilient seals or gaskets except for seal welded doors; penetrations whose design incorporates resilient seals, gaskets, or sealant compounds; piping penetrations fitted with expansion bellows; and electrical penetrations fitted with flexible metal seal assemblies may all exhibit leakage. Type B tests cover this type of leakage as required and will not be affected by the proposed change in the Integrated Leakage Rate Test schedule.

- **Containment Isolation Valves:** These valves provide either a potential or direct connection between the inside and outside atmospheres of the primary reactor containment. Under normal operation, these valves are required to close automatically upon receipt of a containment isolation signal in response to controls intended to effect containment isolation, and are required to operate intermittently under post-accident conditions. Leakage through these valves can be caused by leaking valve seals, isolation valve closure failure, or failure to return a penetration to its normally closed condition following maintenance. These types of leakage are detectable by Type C local leak rate testing. Following maintenance on a containment isolation valve, a Local Leakage Rate Test is performed followed by an independent valve alignment verification to ensure that leakage remains within acceptable levels. Type C tests will not be affected by the proposed change in the Integrated Leakage Rate Test schedule.

The existing Type B and C testing programs will continue to effectively monitor containment isolation components (e.g., valves) for containment leakage as required. Continued overall leak tightness of the active containment components can be assured by the existing Type B and C testing programs as required.

4.1.2 Passive Structure

Two mechanisms could adversely affect the passive structural capability of containment. The first is deterioration of the structure due to pressure, temperature, radiation, chemical, or other such effects. Secondly, modifications can be made to the structure which, if not carefully controlled, could leave the structure with reduced capability.

Absent actual accident conditions, structural deterioration is a gradual phenomenon requiring periods of time well in excess of the proposed interval extension. Other than accident conditions, the only pressure challenge to containment is the Integrated Leakage Rate Test itself.

10 CFR 50, Appendix J, Section V.A requires a general inspection of accessible interior and exterior surfaces of the containment structures and components. The inspection is to be performed prior to any Type A test to uncover evidence of structural deterioration that may affect either the containment structural integrity or leak tightness. At the South Texas Project, there has been no evidence of structural deterioration of Unit 2 containment that would impact structural integrity or leak tightness.

Modifications that would alter the passive containment structure are infrequent and would receive extensive review to ensure containment capabilities are not diminished. The South Texas Project Unit 2 design change and 10 CFR 50.59 programs adequately address such safety significant modifications. In addition, 10 CFR 50, Appendix J, Section IV.A, requires Type A testing to be performed following any major modification to the primary containment boundary. This requirement will be maintained.

4.2 Containment Structural Capability

There are no mechanisms that would adversely affect the structural capability of the containment. Absent actual accident conditions, structural deterioration of containment due to temperature, radiation, chemical or other such effects is a gradual phenomenon requiring extended periods of time to impact containment integrity. Periodic visual inspections required by Technical Specification surveillance 4.6.1.6 and by code inspections should detect such degradation. Therefore, any such degradation will be detected before a detectable leak path develops.

The major reason for performing a Type A leakage rate test on a primary reactor containment building is to verify the structural capability of the containment. A Type A test can detect containment leakage due to loss of structural capability (i.e., structural degradation or an improper containment modification). Loss of containment structural capability is a very unlikely event for the South Texas Project due to the good material condition of the containment structure, containment testing and inspection programs required by 10CFR50.55a and 10CFR50 Appendix J, and modification control programs. These attributes and programs accomplish the purpose of the Appendix J Type A test.

The high quality of the material condition of the containment structures, liner, and liner coatings provides assurance of the structural capability of the containments. Structural degradation of containment is a gradual process that occurs due to the effects of pressure, temperature, radiation, chemical, or other such effects. Such effects are identified and corrected when the containment structure is periodically tested and inspected to verify structural integrity under Section 4.6.1.6 of the Technical Specifications and Subsections

IWE and IWL of the ASME Section XI code. The surveillance required by Section 4.6.1.6 includes tendon testing and inspection of end anchorages and external concrete surfaces for abnormal cracking or grease leakage. The Section XI testing and examination program under Subsection IWL codifies the surveillance requirements of Section 4.6.1.6 and adds certain additional requirements, such as rules for repairs and replacements and NDE personnel qualification requirements for visual examiners. Subsection IWE adds visual examination requirements for the containment liner, seals, gaskets, bolting, and other containment components. These Technical Specification surveillance and code test and examination requirements provide a high degree of assurance that any degradation of the containment structure will be detected and corrected before it can produce a containment leak path.

Modifications altering the containment structure are infrequent and would receive extensive review to ensure containment capabilities are not diminished. The South Texas Project design change control program and the 10CFR50.59 program provide assurance that safety significant modifications are reviewed appropriately.

With the containment design provisions described in Appendix 1 to this attachment, the Nuclear Regulatory Commission concluded the following in the South Texas Project Safety Evaluation Report (NUREG-0781):

- The South Texas Project meets 10CFR50.55a and General Design Criterion 1 with respect to ensuring that the concrete containment is designed, fabricated, erected, constructed, tested and inspected to quality standards commensurate with its safety function by meeting the recommendations of regulatory guides and industry standards.

- The South Texas Project meets General Design Criterion 2 by designing the concrete containment to withstand the most severe earthquake that has been established for the site with sufficient margin and the combinations of the effects of normal and accident conditions with the effects of environmental loadings such as earthquakes and other natural phenomena.

- The South Texas Project meets General Design Criterion 4 by designing the concrete containment so that it is capable of withstanding the dynamic effects associated with missiles, pipe whip, and fluid discharge.

- The South Texas Project meets General Design Criterion 16 by designing the concrete containment so that it is an essentially leak-tight barrier to prevent uncontrolled release of radioactive effluents to the environment.

- The South Texas Project meets General Design Criterion 50 by designing the concrete containment to accommodate the calculated pressure and temperature

conditions resulting from accident conditions, without exceeding the design leakage rate and with sufficient margin.

4.3 Previous Integrated Leakage Rate Test Results

To date, two Type A tests, preoperational and operational, have been performed on Unit 2. There is considerable margin between these Type A test results and the Technical Specification 3.6.1.2 limit of 0.75 La, where La is equal to 0.3% by weight of the containment air per day at the peak accident pressure. These test results demonstrate that South Texas Project Unit 2 has a low leakage containment. Two different testing methods were employed in performing these tests: the mass point leakage rate method and the total time leakage rate method. The results of both test methods are shown below for each of the Unit 2 Type A tests conducted to date at the South Texas Project.

- The Unit 2 pre-operational Type A test was completed on September 27, 1988. The as-found leakage rates (95% upper confidence limit) were:

  Total Time Analysis: 0.034 (weight % per day)

  Mass Point Analysis: 0.034 (weight % per day)

  These results are below the acceptance limit of 0.225 weight % per day (0.75 La). The results of this test were provided to the Nuclear Regulatory Commission by letter dated January 30, 1989 (ST-HL-AE-2969).

- The first Unit 2 operational Type A test was completed on September 23, 1991. The as-found leakage rates (95% upper confidence limit) were:

  Total Time Analysis: 0.0681 (weight % per day)

  Mass Point Analysis: 0.0765 (weight % per day)

  These results are below the acceptance limit of 0.225 weight % per day (0.75 La). The results of this test were provided to the Nuclear Regulatory Commission by letter dated February 13, 1992 (ST-HL-AE-3998). This test was conducted at a higher pressure (42.5 psig vs. 37.5 psig) than the 1988 test to account for an increase in the calculated containment net free volume.

The testing history, structural capability of the containment, and the risk assessments have established that South Texas Project Unit 2 has had acceptable containment leakage rates with considerable margin, that the structural integrity of containment is assured, and that there is negligible risk impact in changing the Type A test schedule on a one-time basis.

4.4 Continuation of Type B and C Tests

Industry experience indicates that 97% of the failures associated with Type A tests are found to occur at penetrations covered by either Type B or Type C tests (NUREG-1493, "Performance-Based Containment Leak-Test Program"). The remaining 3% of Type A test failures were for leakage rates only marginally above the currently prescribed limits for integrated leakage rates.

- Type B leakage rate testing is performed to detect:

  - penetration seal leakage, including airlock door seals;
  - doors with resilient seals or gaskets except for seal welded doors;
  - penetrations that incorporate resilient seals, gaskets, or sealant compounds;
  - piping penetrations fitted with expansion bellows; and
  - electrical penetrations fitted with flexible metal seal assemblies.

  Type B tests to identify leakage of such components will not be affected by this exemption.

- Type C leakage rate testing is performed to verify the leak tightness of containment isolation valves which:

  - provide either a potential or direct connection between the primary reactor containment atmosphere under normal operation and the outside;
  - are required to close automatically upon receipt of a containment isolation signal in response to controls intended to effect containment isolation; and
  - are required to operate intermittently under post-accident conditions.

  Leakage through these valves can be caused by leaking valve seals, isolation valve closure failure, or failure to return a penetration to its normally closed condition following maintenance. Type C local leakage rate testing will detect leakage through containment isolation valves. Following maintenance on a containment isolation valve, a Local Leakage Rate Test is performed followed by an independent valve alignment verification to ensure that leakage remains within acceptable levels. Type C tests will not be affected by this exemption.

The existing Appendix J Type B and Type C testing programs are not being modified by this request. However, the South Texas Project has requested exemption of low safety/risk significant and non-risk significant components from special treatment 10CFR50 requirements in, "Request for Exemption to Exclude Certain Components From The Scope of Special Treatment Requirements Required by Regulations," dated August 31, 2000 (NOC-AE-00000918). Given the minimal safety/risk significance of the components in question, normal commercial and industrial practices are sufficient to ensure that the components will satisfy their functional requirements and have sufficient safety margin. Furthermore, performance of the systems/trains containing safety-related

low safety/risk significant and non-risk significant components will be monitored under the Maintenance Rule program, as applicable, and the Corrective Action Program to ensure that these systems/trains maintain satisfactory levels of performance. Type B and Type C tests of the remaining containment isolation components will continue to be performed in accordance with Appendix J and the associated Technical Specifications.

4.5 Operational Containment Venting

During power operation, instrument air leaks from air-operated valves inside containment and pressurizes the containment building. Instrumentation monitors containment pressure and annunciates conditions approaching the limits allowed by the Technical Specifications. This cycling of the containment pressure during operation amounts to a periodic integrated pressure test of the containment at a low differential pressure. Although not as significant as pressure resulting from a Design Basis Accident, the fact that the containment can be pressurized by leakage from air-operated valves provides a degree of assurance of containment structural integrity (i.e., no large leak paths in the containment structure). This feature is a complement to visual inspection of the interior and exterior of the containment structure for those areas that may be inaccessible for visual examination. In the event pressurization does not occur, a leakage path may be present.

4.6 Risk Assessment

Plant-specific probabilistic risk assessments were not available and therefore were not considered when the regulation requiring compliance with Appendix J was adopted. Overall plant risk due to containment leakage is relatively small, given the small probability of containment leakage occurring. The predominant mechanical contributor to the Large Early Release Frequency (LERF) is failure to isolate the large supplemental purge penetrations in the unlikely event that a purge is in progress during the accident. This contributor would not be impacted by this schedule change. Cessation of Type A testing could increase the probability of a Small Containment Leakage Failure. However, this increased probability has been shown to result in a very small increase in the calculated population dose for the South Texas Project.

The risk impact of containment structural life is measured by a pathway created for radionuclides if the containment is challenged such as in a loss of coolant accident or severe accident. Such leakage does not create any new accident scenarios, nor does it contribute to initiation of an accident.

From a risk standpoint, the purpose of Appendix J leak testing is to detect containment leakage resulting from failures in the containment isolation boundary before an accident occurs. Such leakage could be the result of leakage through containment penetrations, through airlocks, or through containment structural faults. The Appendix J Type B and C tests, which are unaffected by this proposed change, will continue to detect leakage through containment valves, penetrations, and airlocks as required. The only potential

failures that would not be detected by Type B and C testing are mechanical failures of the containment shell (i.e., resulting from degradations or modifications to the containment shell). Inspections performed under ASME Section XI Subsections IWE and IWL would detect such flaws.

The containment structure is passive. Under normal operating conditions, there is no significant environmental or operational stress present that could contribute to its degradation. Passive failures resulting in significant containment structural leakage are therefore extremely unlikely to develop between Type A tests. No such failures have occurred at South Texas Project Unit 2.

The South Texas Project Level 2 Probabilistic Safety Assessment and Individual Plant Examination evaluated the impact of Large and Small Early Release Frequencies for failure of the containment given a core damaging event. The most important causes for a Large Early Release were found to be large containment isolation failures and phenomenological effects associated with severe accidents. The large containment isolation contributor includes failure to isolate the large supplemental purge penetrations in the unlikely event that a purge is in progress during the accident. Large pre-existing leaks in the reactor containment building are not modeled in the South Texas Project Probabilistic Risk Assessment. Over time, the reactor containment building pressure increases during plant operation because of changes in ambient conditions and the numerous air-operated valves inside the building. The increase in the building internal pressure is reduced by periodic operation of the supplementary purge system. With a large pre-existing leak, operation of the containment purge system would not be necessary, and would be noticed by plant operators. The Small Early Release Frequency evaluates the potential for a small pre-existing leak. The impact of this change in the test interval would be a negligible increase to the contribution for a Small Early Release Frequency.

Based on information provided in NUREG-1493, the increased risk of population dose attributable to this extension of the test interval would be extremely small. NUREG-1493 includes the results of a sensitivity study performed to explore the risk impact of several alternate leak rate testing schedules. Alternative 6 from this study examines relaxing the Integrated Leakage Rate Test frequency from 3 in 10 years to 1 in 20 years. Using best estimate data, the NUREG concludes that the increase in population exposure risk to those in the vicinity of the five representative plants ranges from 0.02 to 0.16 %. This low impact on risk is attributable to:

1) the effectiveness of Type B and C tests in identifying potential leak paths (about 97%);
2) a low likelihood of Integrated Leakage Rate Test-identified leakage exceeding 2 times allowable; and
3) the insensitivity of risk to containment leak rate.

NUREG-1493 concludes that even increasing the Integrated Leakage Rate Test interval to once per 20 years would "lead to an imperceptible increase in risk." The one-time extension of the test interval to approximately twelve years, seven months, is concluded to be bounded by the analyses of NUREG-1493. The associated increase in risk is not significant. By comparison, the probability of occupational dose associated with performance of an integrated leakage rate test is 100%.

Details of the South Texas Project Probabilistic Risk Assessment are provided in Appendix 2 to this attachment.

5.0 Savings

The South Texas Project expects to achieve significant savings as a result of deferring the subject Integrated Leakage Rate Test because of the expectation that a rule change will be approved and the deferred test will never have to be performed. Expected savings from deferral of this one test evolution are as follows:

- Avoided occupational dose: 0.954 rem
- Test performance expense: $350,000
- Schedule impact expense: $1,680,000 [Three days @ $560,000 per day]

6.0 Conclusion

The South Texas Project intends to submit a request for a rule change to enable both Unit 1 and Unit 2 to no longer be subject to the requirements of 10CFR50 Appendix J for integrated leakage rate testing. However, because of the Unit 2 integrated leakage rate test currently scheduled for March 2001, deferral of the test is requested to allow sufficient time to obtain approval of the rule change. The March 2001 test is not necessary in light of the expected approval of the rule change, and because of the insignificant change in risk created by extending the test interval. In the event the proposed rule change is not approved by the end of the extended test interval, performing the test at that time will not have significantly increased the risk of exceeding 10CFR100 criteria or posed an increased risk to the public health and safety.

7.0 Implementation

This amendment request is neither an emergency nor exigent. However, the South Texas Project requests that the Nuclear Regulatory Commission approve the proposed amendment by November 30, 2000, to support scheduling activities of the Unit 2 refueling outage currently scheduled for March 2001. Date of effectiveness would follow 30 days after approval.

STATEMENT OF NO SIGNIFICANT HAZARDS CONSIDERATION

Pursuant to 10CFR50.91, this analysis provides a determination that the proposed change to the Technical Specifications for a one-time extension of the interval for Integrated Leakage Rate Testing does not involve any significant hazards consideration as defined in 10CFR50.92.

Criterion 1: The proposed change does not involve a significant increase in the probability or consequences of an accident previously evaluated.

Leakage rate testing does not serve to prevent an accident from occurring; therefore, this proposed change does not involve a significant increase in the probability of a previously evaluated accident.

Type A tests are capable of detecting both local leak paths and gross containment failure paths. An increase in the consequences of an accident would be an increase in the amount of radioactive material released to the atmosphere due to an undetected leak path. However, Type A testing is not needed to ensure leakage rates through containment penetrations are acceptable. Experience at the South Texas Project demonstrates that excessive containment leakage paths are detected by Type B and C Local Leakage Rate Tests. Administrative controls govern maintenance and testing of containment penetrations such that the probability of excessive penetration leakage due to improper maintenance or valve misalignment is very low.

- Following maintenance on a containment penetration, a Local Leakage Rate Test is performed to ensure acceptable leakage levels.
- Following a Local Leakage Rate Test on a containment isolation valve, an independent valve alignment check is performed.
- The structural capability of the containments is assured by the existing material conditions, testing and inspection programs, and modification control programs.
- Operational venting of containment demonstrates that the containment structures are free of significant leakage paths.
- The containment is subjected to a visual examination in accordance with 10CFR50.55a.

Therefore, this proposed amendment does not involve a significant increase in the probability or consequences of any accident previously evaluated.

Criterion 2: The proposed change does not create the possibility of a new or different kind of accident from any previously evaluated.

This proposed change will not affect normal plant operations or configuration, nor will it affect leak rate test methods or test schedules for Type B or Type C testing. Type B and C testing in combination with required containment surveillances and code inspections will assure the Technical Specification limiting conditions for containment leakage rate and structural capability will continue to be met. Because this proposed Technical Specification amendment would not

change the design, configuration, or method of operation of the plant, this proposed change does not create the possibility of a new or different kind of accident from any previously evaluated.

Criterion 3: The proposed change does not involve a significant reduction in the margin of safety.

The purpose of the existing Integrated Leakage Rate Testing is to help ensure that releases of radioactive materials are restricted to those leak paths and leak rates assumed in accident analyses. This one-time deferral of Integrated Leakage Rate Testing will not affect containment leak rate testing by Type B and C Local Leakage Rate Tests. Type B and C testing is sufficient to meet the performance objectives of 10CFR50, Appendix J. Therefore, the required test methods for detecting local containment leak paths and leak rates are unaffected by this proposed change. Deferral of Type A testing for the South Texas Project does not increase the level of public risk due to loss of capability to detect and measure containment leakage or loss of containment structural capability. Other containment testing methods and inspections will assure all limiting conditions of operation will continue to be met. The margin of safety inherent in existing accident analyses is maintained.

Conclusion

Based on the evaluation provided above, the proposed change does not involve a significant hazards consideration and will not have a significant effect on the safe operation of the plant. Therefore, there is reasonable assurance that operation of the South Texas Project in accordance with the proposed revised Technical Specifications will not endanger the public health and safety.

SOUTH TEXAS PROJECT
UNIT 2
REACTOR CONTAINMENT DESIGN AND CONSTRUCTION

Each South Texas Project containment is a fully continuous, steel-lined, post-tensioned, reinforced concrete structure consisting of a vertical cylinder with a hemispherical dome, supported on a flat foundation mat. The cylinder and dome are post-tensioned with high-strength unbonded wire tendons. The dimensions of the containment are: 150-foot inside diameter, 239-1/4-foot inside height to the top of the dome, with four-foot cylinder wall thickness, three-foot dome thickness, and 18-foot mat thickness. The top of the foundation mat is 41-1/4 feet below grade.

A continuous welded steel liner plate is provided on the entire inside face of the containment to limit release of radioactive materials into the environment. The nominal thickness of the liner in the wall and dome is 3/8-inch. A 3/8-inch-thick plate is used on top of the foundation mat and is covered with a 24-inch concrete fill slab. An increased plate thickness up to two inches is provided around all penetrations and for the crane girder brackets.

An anchorage system is provided to prevent instability of the liner. For the dome, the anchorage system consists of meridional structural tees, circumferential angles, and plates. A system of vertical and circumferential stiffeners is provided for the cylinder, using structural angles, channels, and plates.

Leak chase channels and angles are provided at the bottom liner seams which, after construction, are inaccessible for leak tightness examination due to the two-foot interior fill slab.

The cylindrical wall is reinforced with conventional steel reinforcing bars throughout the structure. The bars are placed in a horizontal and vertical pattern in each face of the cylinder wall. Additional bars are provided around penetrations and in the buttresses to resist local stress concentrations. Radial shear reinforcement is provided throughout, and tangential shear reinforcement is provided where required.

The reinforcement in the dome is provided in a meridional and circumferential pattern up to 45 degrees from the spring line, with the remaining area being reinforced using a grid pattern. Reinforcement is provided on both faces of the dome wall. Radial ties are provided to both resist radial shear and prevent delamination of the dome under pre-stressing.

PROBABILISTIC RISK ASSESSMENT

South Texas Project Probabilistic Risk Assessment

The South Texas Project Probabilistic Risk Assessment (PRA) is a full Level 2 analysis of Core Damage Frequency (CDF) and Containment Response including Large Early Release Frequency and Small Early Release Frequency. The results for LERF are dominated by sequences caused by a phenomenon called Induced Steam Generator Tube Rupture (ISGTR). ISGTR occurs when the secondary side of the steam generators dries out after a core damage event with the reactor coolant system intact at high pressure. High temperature coolant from the degraded core circulates through the Reactor Coolant System, heating up the steam generator tubes to the point of failure. The Induced Steam Generator Tube Rupture sequences are primarily caused by core damage scenarios that involve loss of all station AC power (Station Blackout). The Integrated Leakage Rate Test does not test this pathway through the steam generators.

The dominant cause of containment bypass is failure of the supplementary containment purge to isolate during an accident sequence. This sequence is not affected by Integrated Leakage Rate Testing.

NRC Guidance on Use of Probabilistic Risk Assessment

Utilization of risk insight to assess the impact of extending the interval for performance of Integrated Leakage Rate Tests is consistent with the NRC guidance in Regulatory Guide 1.174 for risk-informed decision-making.

Sufficient Safety Margins Are Maintained

This change does not affect any accident parameters discussed in the South Texas Project UFSAR. Containment leakage rate requirements described in the current licensing basis for South Texas Project systems, structures, and components will continue to be met. Equipment functionality, reliability, and availability will be unaffected by this change.

Proposed changes in risk, both individual and cumulative, are small and do not cause NRC Safety Goals to be exceeded.

Overall plant risk due to containment leakage is relatively small, given the small probability of containment leakage itself. The predominant mechanical contributor to the Large Early Release Frequency is failure to isolate the large supplemental purge penetrations in the unlikely event that a purge is in progress during the accident. This contributor would not be impacted by this exemption request and Technical Specification changes.

Postponement of Type A testing could increase the probability of a Small Containment Leakage Failure. This increased probability has been shown to result in a very small increase in the calculated population dose for the South Texas Project. However, the increased calculated population dose is bounded by 10CFR100 limits. Therefore, the exemption would not cause a significant change in risk, or cause the NRC Safety Goals to be exceeded.

PROPOSED TECHNICAL SPECIFICATION CHANGE –

MARKED-UP VERSION

PROCEDURES AND PROGRAMS (Continued)

j) Containment Leakage Rate Testing Program

A program shall be established to implement the leakage rate testing of the primary containment as required by 10 CFR 50.54(o) and 10 CFR Part 50, Appendix J, Option B, as modified by approved exemptions. This program shall be in accordance with the guidelines contained in Regulatory Guide 1.163, "Performance-Based Containment Leak-Testing Program", dated September 1995. Performance of the Unit 2 integrated leakage rate (Type A) test has been deferred from March 2001 to no later than April 2004. Peak calculated primary containment internal pressure for the design basis loss of coolant accident (LOCA), Pa. is 41.2 psig.

The maximum allowable primary containment leakage rate, La, is 0.3% of primary containment air weight per day.

Leakage rate acceptance criteria are:

a. Primary containment overall leakage rate acceptance criterion is < 1.0 La. During the first unit start-up following testing in accordance with this program, the leakage rate acceptance criteria are < 0.60 La for the combined Type B and Type C tests, and < 0.75 La as-left and < 1.0 La as-found for Type A tests.

b. Air lock testing acceptance criteria for the overall air lock leakage rate is < 0.05 La when tested at > Pa.

The provisions of Surveillance Requirement 4.0.2 do not apply to the test intervals specified in the Containment Leakage Rate Testing Program.

The provisions of Surveillance Requirement 4.0.3 apply to the Containment Leakage Rate Testing Program.

k) Configuration Risk Management Program (CRMP)

A program to assess changes in core damage frequency and cumulative core damage probability resulting from applicable plant configurations. The program should include the following:

1) training of personnel,

2) procedures for identifying plant configurations, the generation of risk profiles and the evaluation of risk against established thresholds; and

3) provisions for evaluating changes in risk resulting from unplanned maintenance activities.

PROPOSED TECHNICAL SPECIFICATION CHANGE –

CLEAN VERSION

PROCEDURES AND PROGRAMS (Continued)

j) Containment Leakage Rate Testing Program

A program shall be established to implement the leakage rate testing of the primary containment as required by 10 CFR 50.54(o) and 10 CFR Part 50, Appendix J, Option B, as modified by approved exemptions. This program shall be in accordance with the guidelines contained in Regulatory Guide 1.163, "Performance-Based Containment Leak-Testing Program", dated September 1995. Performance of the Unit 2 integrated leakage rate (Type A) test has been deferred from March 2001 to no later than April 2004.

Peak calculated primary containment internal pressure for the design basis loss of coolant accident (LOCA), Pa. is 41.2 psig.

The maximum allowable primary containment leakage rate, La, is 0.3% of primary containment air weight per day.

Leakage rate acceptance criteria are:

a. Primary containment overall leakage rate acceptance criterion is < 1.0 La. During the first unit start-up following testing in accordance with this program, the leakage rate acceptance criteria are < 0.60 La for the combined Type B and Type C tests, and < 0.75 La as-left and < 1.0 La as-found for Type A tests.

b. Air lock testing acceptance criteria for the overall air lock leakage rate is < 0.05 La when tested at > Pa.

The provisions of Surveillance Requirement 4.0.2 do not apply to the test intervals specified in the Containment Leakage Rate Testing Program.

The provisions of Surveillance Requirement 4.0.3 apply to the Containment Leakage Rate Testing Program.

k) Configuration Risk Management Program (CRMP)

A program to assess changes in core damage frequency and cumulative core damage probability resulting from applicable plant configurations. The program should include the following:

1) training of personnel,

2) procedures for identifying plant configurations, the generation of risk profiles and the evaluation of risk against established thresholds; and

3) provisions for evaluating changes in risk resulting from unplanned maintenance activities.