

Public Service
Electric and Gas
Company

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Vice President - Nuclear Operations

APR 04 1995

LR-N95032
LCR 94-47

United States Nuclear Regulatory Commission
Document Control Desk
Washington, DC 20555

Gentlemen:

**LICENSE AMENDMENT APPLICATION
ONE-TIME EXEMPTION FROM APPENDIX J, TYPE A TEST
FACILITY OPERATING LICENSE NOS. DPR-70
SALEM GENERATING STATION, UNIT NO. 1
DOCKET NOS. 50-272**

This letter submits an application for amendment to Appendix A of Facility Operating License DPR-70 for the Salem Generating Station, Unit No. 1, and is being filed in accordance with 10CFR50.90. In accordance with 10CFR50.91(b)(1), a copy of this amendment request has been sent to the State of New Jersey. This application requests a one-time exemption from the requirements of 10CFR50, Appendix J, "Primary Reactor Containment Leakage Testing for Water Cooled Power Reactors," regarding integrated leak rate testing intervals, and the Technical Specification amendment necessary to implement the exemption at Salem Generating Station Unit No. 1 (SGS1). This exemption and amendment would provide a one-time interval extension for the Type A test (containment integrated leak rate test (ILRT)), currently scheduled for the twelfth refueling outage, until the thirteenth refueling outage.

Attachment 1 contains a detailed description of and justification for the proposed Technical Specification change necessary to implement the requested one-time exemption. Based upon the justification provided, PSE&G believes that the proposed changes do not involve a significant hazard consideration pursuant to 10CFR50.92.

Attachment 2 contains a justification for a request of the one-time exemption from 10CFR50 Appendix J, Section III.D.1(a), "Primary Reactor Containment Leakage Testing for Water Cooled Power Reactors."

Attachment 3 contains marked up Technical Specification pages which reflect the proposed changes.

In response to the NRC Cost Beneficial Licensing Action (CBLA) initiative, Public Service Electric & Gas (PSE&G) met with the

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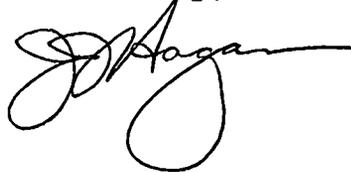
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NRR Staff on November 12, 1993, to discuss our CBLA Program. PSE&G considers this submittal a CBLA. We have estimated that the proposed exemption and associated Technical Specification change would yield a cost savings of \$1,000,000 during the SGS1 twelfth refueling outage.

Public Service Electric and Gas (PSE&G) requests that the effective date of this Technical Specification change and exemption be the date of NRC approval, but not later than July 1, 1995, in order to facilitate scheduling for the outage in September 1995. Although this request is neither exigent nor an emergency, your prompt review is requested.

Should you have any questions or comments on this submittal, please do not hesitate to contact us.

Sincerely,



Affidavit
Attachments (3)

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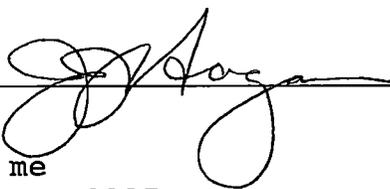
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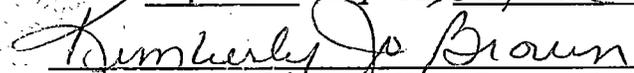
STATE OF NEW JERSEY)
) SS.
COUNTY OF SALEM)

J. J. Hagan, being duly sworn according to law deposes and says:

I am Vice President - Nuclear Operations of Public Service Electric and Gas Company, and as such, I find the matters set forth in the above referenced letter, concerning the Salem Generating Station Unit No. 1, are true to the best of my knowledge, information and belief.



Subscribed and Sworn to before me
this 4th day of April, 1995



Notary Public of New Jersey

My Commission expires on _____
KIMBERLY JO BROWN
NOTARY PUBLIC OF NEW JERSEY
My Commission Expires April 21, 1998

ATTACHMENT 1
PROPOSED CHANGES TO THE TECHNICAL SPECIFICATIONS

LICENSE AMENDMENT APPLICATION
ILRT ONE-TIME SCHEDULAR EXEMPTION
SALEM GENERATING STATION, UNIT NO. 1
FACILITY OPERATING LICENSE DPR-70
DOCKET NO. 50-272

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I. DESCRIPTION OF THE PROPOSED CHANGES

"Type A Tests" are defined in Appendix J Section II.F. as "tests intended to measure the primary reactor containment overall integrated leakage rate" (ILRT).

Exemption is requested from the following paragraph in Section III.D.1(a) for Type A test intervals:

"...a set of three Type A tests shall be performed, at approximately equal intervals during each 10-year service period. The third test of each set shall be conducted when the plant is shutdown for the 10-year plant inservice inspection."

The proposed exemption to 10CFR50, Appendix J, Section III.D.1(a), "Type A Periodic Retest Schedule" would allow for a one-time extension of the interval between the first and second Type A test during the second ten year service period. The extension would allow the Type A integrated leak rate test (ILRT) to be performed at the thirteenth refueling outage instead of the twelfth refueling outage as currently scheduled.

The purpose of the Appendix J leak test requirements, as stated in the Introduction to 10CFR50 Appendix J, is to "assure that (a) leakage through the primary reactor containment and systems and components penetrating primary containment shall 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 systems and components penetrating primary containment."

This exemption request concerns part (a) of the stated purpose of Appendix J. Part (b) of the stated purpose of Appendix J applies to penetrations and isolation valves, which are tested by Type B and C Local Leak Rate Tests (LLRT). These testing requirements will remain unchanged.

10CFR50 Appendix J, Section III.D.1(a) requires three Type A tests at approximately equal intervals during each 10-year service period. Technical Specification 4.6.1.2.a requires three ILRTs to be performed at 40 +/- 10 month intervals during each

10-year service period. According to this schedule, an ILRT will need to be performed during the Unit 1 Cycle 12 refueling outage. The proposed one-time exemption would allow this ILRT to be delayed until the Cycle 13 refueling outage, currently scheduled to begin February 1997. The requested extension to June 1997 would ensure scheduling margin would be available to perform the Type A test during the Unit 1 thirteenth refueling outage.

II. REASON FOR THE PROPOSED CHANGES

According to 10CFR50.12, the NRC will grant an exemption to a requirement if special circumstances are present. This exemption request and associated Technical Specification change meet the special circumstances of paragraphs [(a)(1)], [(a)(2)(ii)], and [(a)(2)(v)]. The exemption request and Technical Specification change demonstrate that: the proposed exemption will not present an undue risk to the public health and safety and is consistent with the common defense and security [(a)(1)]; application of the regulation in the particular circumstances would not serve the underlying purpose of the rule or is not necessary to achieve the underlying purpose of the rule [(a)(2)(ii)]; and the proposed exemption would provide only temporary relief from the applicable regulation [(a)(2)(v)].

III. JUSTIFICATION FOR THE PROPOSED CHANGES

Factors affecting leak-tightness of the containment may be categorized as components which are leak rate tested by Type B and C tests and the containment structure which is tested during the Type A test (i.e., the ILRT).

The major containment leakage paths include:

- 1) **Penetration Seal Leakage:** Air lock door seals; doors with resilient seals or gaskets except for seal welded doors; and 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 and will not be affected by the proposed changes in the ILRT test schedule.
- 2) **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, 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. For all of these initiating events, this type of leakage is detectable by Type C local leak rate testing. Following any maintenance on a Containment Isolation Valve, an LLRT 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 ILRT test schedule.

The existing Type B and C testing programs are not being modified by this request and will continue to effectively detect containment leakage caused by the degradation of active containment isolation components (e.g., valves) as well as sealing material within containment penetrations.

- 3) **Leakage Through Containment Shell (Liner):** This is a low probability leakage path which is only detected by a Type A test.

SGS1 has not experienced an unacceptable Type A test and industry experience indicates that 97% of the failures associated with Type A tests are found to be due to Type B and C tested penetrations. The local leak rate testing frequencies of these penetrations are not affected by this proposed change. Therefore, continued overall leak tightness of active containment components can be assured by the reliable Type B and C testing program.

Two mechanisms could adversely affect the leak tightness of the containment. The first, a time-based failure mechanism, is deterioration of the structure due to pressure, temperature, radiation, chemical or other such effects. Secondly, an activity-based failure mechanism, modifications could be made to or maintenance performed on 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 the containment structure is the ILRT itself.

10CFR50 Appendix J Section V.A. requires a general inspection of the accessible interior and exterior surfaces of the containment structures and components to be performed

prior to any Type A Test to uncover any evidence of structural integrity or leak tightness. At SGS1, there has been no evidence of structural deterioration that would impact structural integrity or leak tightness.

Modifications made to the containment must continue to meet the original construction requirements. In fact, modifications which may alter the passive containment structure are infrequent and would receive extensive scrutiny to ensure containment capabilities are not diminished. The SGS1 design change process, 10CFR50.59 process, and other similar programs have been demonstrated to be effective in providing high quality oversight of such safety significant modifications.

To additionally address the potential of degradation due to an activity-based mechanism, a review was performed of all modifications which are scheduled to be performed during SGS1 refueling outage 12. This review determined that the modifications do not impact the boundaries which would be tested during the ILRT. A review of all modifications since the last ILRT was also conducted. This review indicated that one modification was performed (Service Water Piping Replacement), that was a containment boundary modification, which would normally have been testing by a Type A test. However, a test box was built around the penetration area, which was then locally tested. This test satisfied the 10CFR50 Appendix J Section IV.A requirement by simulating a Type A test. The leak test results were satisfactory. Furthermore, at SGS1 there are administrative controls on maintenance activities, such as post maintenance testing, which ensure that any maintenance activity which affects a primary containment penetration is local leak rate tested after the activity. Based on the review of the plant modifications and the administrative controls at SGS1, it is concluded that work to be performed on the primary containment will not adversely affect the containment boundary.

In addition, 10CFR50 Appendix J Section IV.A requires Type A testing to be performed following any major modification to the primary containment structure boundary. This requirement will be maintained.

Type A Testing History

10CFR50 Appendix J, Section II.K defines the acceptable leakage limit L_a as, "the maximum allowable leakage rate at pressure P_a (calculated design basis accident peak containment pressure) as specified for pre-operational tests in the Technical Specifications or associated bases, and as specified for periodic tests in the operating license." According to Technical Specification 3.6.1.2, the leakage limit for an ILRT is $0.75 L_a$, which is 162,188 sccm (standard cubic centimeters/minute). As can be seen from the following Type A Test History, listed in Table 1, there have been no Type A test failures at Salem Generating Station Unit 1.

Date ILRT Performed	Results (@ 95% upper confidence level) sccm	% L_a	Results corrected for as found data	% L_a
8/79	134,075	.620%	N/A	N/A *
8/84	88,663	.410%	107,030	.49%
12/87	92,988	.430%	135,666	.63%
4/91	74,548	.344%	90,338	.42%

* Type A Test results were not corrected for "as found" conditions until 1984. The "as found" corrections are described in NRC Information Notice 85-71.

The SGS1 Type A test history provides substantial justification for the proposed test schedule. As can be seen in Table 1, four (4) Type A tests have been performed to date and SGS1 ILRTs have not exceeded the 10CFR50 Appendix J acceptance criteria of $1.0 L_a$, where L_a is equal to 0.1% per day of containment atmosphere at a peak accident pressure of 47 psig. Also, considerable margin exists between the Type A test results and the Technical Specification limit of $0.75 L_a$. These tests demonstrate that SGS1 has a low leakage containment and that the proposed one-time extension would not jeopardize the ability of the containment to maintain the leakage rate at or below the required Type A limits.

The Type A tests and associated visual examinations have not identified any conditions that would challenge the leak tight integrity of the containment structure or leakage paths that have not been identified by the local leak rate test (Type B and C) program. Corrective action has been taken on penetrations with

unacceptable leakage. The Penetrations with a history of unacceptable as found leakage are limited to the containment air lock shaft seals.

Containment air lock shaft seals are leak rate tested (Type B) as part of the overall air locks test conducted every 6 months in accordance with SGS1 Technical Specifications. The corrective action had consisted of seal adjustment whenever an unacceptable leakage was detected. During the SGS1 eleventh refueling outage (October 1993), a new type of shaft seal was installed. Subsequently, no unacceptable leakage has been detected.

Therefore, the extended Type A Testing interval is justified based on:

- * Reliability of the passive containment structure,
- * Maintaining containment boundary modification testing requirements in accordance with Appendix J Section IV.A.,
- * The Type B and Type C testing program will continue throughout the proposed extended test interval, and
- * The history of Type A tests indicate there have not been any new leakage paths identified that were not identified by the Type B and C test program.

Risk Impact Assessment

The risk impact of containment structural leakage is to create a release pathway for radionuclides in the event that the containment is challenged, such as in a loss-of-coolant accident (LOCA) or severe accident. Such leakage does not create any new accident scenarios, nor does it contribute to the initiation of any accident. According to the SGS IPE, containment leakage has a negligible contribution to containment failure. Therefore, extension of the ILRT interval would have minimal impact on SGS1 capability to mitigate releases in post accident core damage scenarios.

From a risk standpoint, the purpose of Appendix J leak testing is to detect any containment leakage resulting from failures in the containment isolation boundary and to provide periodic assurance of accident mitigation capability. Such leakage could be the result of leakage through containment penetrations, through air locks, 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 air locks. The only potential failures that would not be detected by Type B and C testing are mechanical failures of the containment shell (i.e., degradations or modifications to the containment shell). Thus the only potential effect of the proposed one-time change to the Type A test frequency is the probability that containment structural leakage would go undetected between tests.

The containment structure is passive. Under normal conditions, there is no significant environmental or operational stress which 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 failure has occurred at SGS1.

The results of containment facility analysis, performed in support of the SGS1 Individual Plant Examination, indicated that the SGS1 containment is actually built to withstand a much higher pressure than the design pressure. The SGS1 containment strength degrades with temperature. For example, up to a temperature of 600 degrees Fahrenheit, the lowest High Confidence of Low Probability of Failure (HCLPF) of the containment is 89 PSIG and the probable failure modes are basemat flexure and dome meridional membrane failure, neither of which are correlated with containment leakage. The ILRT tests pressurize the containment to 47 PSIG, peak accident pressure, at atmospheric temperature and are not intended to test the structural integrity of the containment. Due to the fact that the SGS1 containment is actually built to withstand approximately twice the design pressure and temperature, we believe that this one-time exemption is acceptable.

Postulated containment failure under severe accident conditions is primarily due to phenomenological effects associated with severe accidents. Such effects were considered as part of the SGS IPE. None of the identified containment failure mechanisms for severe accidents would be significantly impacted by the proposed increase in the testing interval.

The conclusion of this qualitative risk assessment is that Type A tests do not significantly affect the frequency of accident sequences involving releases from containment. This is due to the following reasons.

- * Other testing programs will effectively detect containment leakage caused by degradation of containment penetrations,

- * Passive failure of the containment structure itself is extremely unlikely,

Events challenging containment have calculated frequencies of occurrence which are very low.
- * Containment failure mechanisms which are dominant in the SGS IPE are associated with severe accident phenomena which are not affected by the proposed exemption to the Appendix J Type A test program,
- * The release frequency is dominated by late containment failure and at pressures and temperature that are approximately twice the design values.

Cost Reduction Assessment

ILRTs are labor intensive and require a significant amount of critical path time. The actual critical path time required to perform the test is, at a minimum, 4 days. Elimination of the ILRT from the SGS1 twelfth refueling outage schedule would result in other work becoming critical path and could reduce the outage by as much as 3 days. Estimating \$250,000 per day for plant downtime, the estimated savings of this exemption could be as much as \$750,000. Accounting for person-hours expended, preparation time, and restoration time, the estimated savings of this Type A test exemption is in excess of \$1,000,000 for SGS1 twelfth refueling outage.

IV. SIGNIFICANT HAZARDS CONSIDERATION EVALUATION

PSE&G has, pursuant to 10 CFR 50.92, reviewed the proposed amendment to determine whether the request involves a significant hazards consideration. We have determined that operation of the Salem Generating Station in accordance with the proposed changes:

1. Will not involve a significant increase in the probability or consequences of an accident previously evaluated.

The proposed change will provide a one-time exemption from 10CFR50 Appendix J Section III.D.1(a) leak rate test schedule requirement. This change will allow for a one-time test interval for Type A Integrated Leak Rate Tests (ILRTs) of 65 +/- 10 months.

Leak rate testing is not an initiating event in any accident, 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. The history at Salem Generating Station Unit 1 (SGS1) demonstrates that Type B and C Local Leak Rate Tests (LLRTs) have consistently detected any excessive local leakages. SGS1 has passed all of its ILRTs with significant margin.

Administrative controls govern the 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 any maintenance that could affect the leakage characteristics of any containment penetration, an LLRT is performed to ensure acceptable leakage levels. Following any LLRT on a containment isolation valve, an independent valve alignment check is performed before declaring the penetration OPERABLE. Therefore, Type A testing is not necessary to ensure acceptable leakage rates through containment penetrations.

While Type A testing is not necessary to ensure acceptable leakage rates through containment penetrations, Type A testing is necessary to demonstrate that there are no gross containment failures. Structural failure of the containment is considered to be a very unlikely event, and in fact, since SGS1 has been in operation, it has never failed a Type A ILRT. Therefore, a one-time exemption increasing the interval for performing an ILRT does not result in a significant decrease in the confidence in the leak tightness of the containment structure.

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

2. Will not create the possibility of a new or different kind of accident from any accident previously evaluated.

This proposed change allows a one-time test interval of 65 +/- 10 months for the next ILRT. The method of performing the test is not changed. No new accident modes are created by extending the testing intervals. No safety-related equipment or safety functions are altered as a result of this change. A one-time extension of the ILRT test interval has no influence on, nor does it contribute in any way to, the possibility of a new or different kind of accident or malfunction from those previously analyzed.

3. Will not involve a significant reduction in a margin of safety.

The purpose of the existing schedule of ILRTs is to ensure that the release of radioactive materials will be restricted to those leak paths and leak rates assumed in accident analyses. The relaxed schedule for ILRTs does not allow for relaxation of Type B and C LLRTs. Therefore, methods for detecting local containment leak paths and leak rates are unaffected by this proposed change. Given that the test history for ILRTs shows no failure during plant life, a one-time increase of the test interval does not lead to a significant probability of creating a new leakage path or increased leakage rates, and the margin of safety inherent in existing accident analyses is maintained. Therefore, this change does not involve a significant reduction in the margin of safety.

V. CONCLUSION

As discussed above, PSE&G has concluded that the proposed changes to the Technical Specifications do not involve a significant hazards consideration since the changes: (i) do not involve a significant increase in the probability or consequences of an accident previously evaluated, (ii) do not create the possibility of a new or different kind of accident from any accident previously evaluated, and (iii) do not involve a significant reduction in a margin of safety.

VI. REFERENCES

1. Letter to USNRC from S. LaBruna (PSE&G), NLR-N93109, dated July 30, 1993 (transmits SGS Individual Plant Examination).
2. EPRI TR-104285, "Risk Impact Assessment of Revised Containment Leak Rate Testing Intervals," August 1994.

**ATTACHMENT 2
BASIS FOR ONE-TIME EXEMPTION FROM APPENDIX J TYPE A TEST**

**LICENSE AMENDMENT APPLICATION
ILRT ONE-TIME SCHEDULING EXEMPTION
SALEM GENERATING STATION, UNIT NO. 1
FACILITY OPERATING LICENSE DPR-70
DOCKET NO. 50-272**

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50.12(a)(1) The proposed exemption will not present an undue risk to the public health and safety, and are consistent with the common defense and security:

An assessment of the risk impact in Attachment 1 concludes that there is no undue risk to the public health and safety as a result of the proposed one-time scheduling extension of the Type A test.

50.12(a)(2)(ii) Application of the regulation is not necessary to achieve the underlying purpose of the rule:

The underlying purpose of 10CFR50, Appendix J is still achieved. Appendix J states that the leakage test requirements set forth in this appendix provide for periodic verification by tests of the leak tight integrity of the primary reactor containment. The appendix further states that the purpose of the tests is to assure that leakage through the primary reactor containment shall not exceed the allowable leakage rate values as specified in the Technical Specifications or associated bases.

10CFR50, Appendix J, Section III.D.1(a) states that a set of three periodic tests shall be performed at approximately equal intervals during each 10-year period and that the third test shall be conducted when the plant is shutdown for the 10-year plant inservice inspections. This exemption would extend the interval between the first and second Type A tests of the second ten year interval. The methodology, acceptance criteria, and technical specification leakage limits for the performance of the Type A test will not change.

The historical Type A test results as set forth in justification for the change (Attachment 1) demonstrate that SGS1 has a low leakage containment. Four Type A tests have been performed at SGS1 without a single failure, and considerable margin exists between the Type A tests results and the Appendix J acceptance criteria of 1.0 La and the Technical Specification limit of 0.75 La, where La is equal to 0.1% per day of containment atmosphere at a peak accident pressure of 47 PSIG.

The four Type A tests performed to date have not identified any leakage paths that have not been identified by the Type B and C test program. In addition, there are no identified mechanisms which would adversely affect the leak tightness of the containment boundary that are not tested by the Type B and C testing program. Absent actual accident conditions, structural deterioration of containment due to temperature, radiation, chemical or other such effects is a gradual phenomenon requiring periods of time well in excess of the proposed interval extension and is subject to detection by periodic visual inspections. In fact, other than accident conditions, the only pressure challenge to containment is the integrated leak rate test (ILRT) itself.

The testing history, structural capability of the containment, and the risk assessment discussed previously establish that SGS1 has acceptable containment leakage rates, that the integrity of containment is assured, and that there is negligible risk impact in changing the Type A test schedule on a one-time basis.

This exemption request does not affect the periodic schedule for Type B and C test which will continue to be performed in accordance with Appendix J. Demonstrated operability of the associated components and penetrations through Type B and C tests adds assurance that the overall Type A leakage rates remain satisfactory. No significant leakage trends have been identified which threaten the overall containment leakage specifications. There is no significant change in the types or increase in the amounts of any effluents that may be released offsite due to the one-time extension of the second Type A test during the second ten year interval. The one-time change does not impact the design basis of the plant and would not affect the response of containment during a design basis accident.

Thus, there is significant assurance that the extended interval between Type A tests will continue to provide periodic verification of the leak tight integrity of the containment.

50.12(a)(2)(v) The exemption would provide only temporary relief from the applicable regulation:

PSE&G is requesting a one-time scheduling exemption from 10CFR50 Appendix J, Section III.D.1(a), which would allow one-time extension of the interval between the first and second Type A test during the second ten year service period.