



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

March 31, 1995

Mr. William L. Stewart
Executive Vice President, Nuclear
Arizona Public Service Company
Post Office Box 53999
Phoenix, Arizona 85072-3999

SUBJECT: ISSUANCE OF SCHEDULAR EXEMPTION FROM THE REQUIREMENTS OF 10 CFR PART 50, APPENDIX J, FOR PALO VERDE NUCLEAR GENERATING STATION, UNIT NO. 1, REGARDING DELAY OF NEXT REQUIRED TYPE A LEAKAGE RATE TEST (TAC NO. M89112)

Dear Mr. Stewart:

By letter dated December 28, 1994, Arizona Public Service Company (APS) requested a one-time schedular exemption to delay performance of a Type A test, as required by 10 CFR Part 50, Appendix J, for a period of approximately 20 months. In addition, APS requested an exemption to decouple the third test from the endpoint of the first 10-year inservice inspection period, as required by Appendix J.

The NRC staff has reviewed the information provided in support of your exemption request. On the basis of the submitted information and as discussed in the enclosed exemption, the NRC staff has concluded that there is a high degree of confidence that the containment will not degrade to an unacceptable extent while this exemption is in effect. Thus, the NRC staff has concluded that your request is justified and your request for a schedular exemption to delay performance of the Type A test until the 1996 refueling outage, and to perform testing on a schedule irrespective of the inservice inspection period, is granted.

We find that granting the exemption from the requirements of 10 CFR Part 50, Appendix J, Section III.D.1.(a), is authorized by law, will not present an undue risk to the public health and safety, is consistent with the common defense and security, and meets the special circumstances described in 10 CFR 50.12(a)(2)(ii).

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This exemption is effective upon issuance and shall expire at the completion of the 1R7 refueling outage.

FOR THE NUCLEAR REGULATORY COMMISSION

Elinor G. Adensam

Elinor G. Adensam, Acting Director
Division of Reactor Projects - III/IV
Office of Nuclear Reactor Regulation

Dated at Rockville, Maryland,
this 31st day of March 1995

Mr. William L. Stewart

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March 31, 1995

A copy of the Exemption is enclosed. The Exemption has been forwarded to the Office of the Federal Register for publication.

Sincerely,

ORIGINAL SIGNED BY:

Brian E. Holian, Senior Project Manager
Project Directorate IV-2
Division of Reactor Projects III/IV
Office of Nuclear Reactor Regulation

Docket No. STN 50-528

Enclosure: Exemption

cc w/encl: See next page

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Arizona Public Service Company

Palo Verde

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UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

In the Matter of)	
ARIZONA PUBLIC SERVICE COMPANY, ET AL.)	Docket No. STN 50-528
(Palo Verde Nuclear Generating Station,)	
Unit No. 1))	

EXEMPTION

I.

The Arizona Public Service Company, et al. (APS or the licensee) is the holder of Facility Operating License No. NPF-41, which authorizes operation of the Palo Verde Nuclear Generating Station, Unit No. 1 (PVNGS-1). The license provides, among other things, that PVNGS-1 is subject to all rules, regulations, and orders of the U.S. Nuclear Regulatory Commission (the Commission or NRC) now or hereafter in effect. The PVNGS-1 facility is a pressurized water reactor located at the licensee's site in Maricopa County, Arizona.

II.

Section III.D.1.(a) of Appendix J to 10 CFR Part 50 requires the performance of three Type A containment integrated leakage rate tests (ILRTs) at approximately equal intervals during each 10-year service period of the primary containment. The third test of each set shall be conducted when the plant is shut down for the 10-year inservice inspection.

III.

By letter dated December 28, 1994, the licensee requested temporary relief from the requirement to perform a set of three Type A tests at approximately equal intervals during each 10-year service period of the primary containment. The requested exemption would permit a one-time interval extension of the third Type A test by approximately 20 months (from the 1995 refueling outage, which begins in May 1995, to the sixth refueling outage (1R6), currently scheduled for September 1996) and would permit the third Type A test of the 10-year inservice inspection period not to correspond with the end of the inservice inspection interval.

The licensee's request concluded that the proposed changes for PVNGS-1, a one-time extension of the interval between the second and third ILRTs and a decoupling of the third test from the outage corresponding to the end of the 10-year inservice inspection period, is justified for the following reasons:

The previous testing history at PVNGS-1 provides substantial justification for the proposed test interval extension. Type A testing is performed to determine that the total leakage from primary containment does not exceed the maximum allowable leakage rate (L_a) as specified in the PVNGS-1 technical specifications (TS). The primary containment maximum allowable leakage rate provides an input assumption to the calculation required to ensure that the maximum potential offsite dose during a design basis accident does not result in a dose in excess of that specified in 10 CFR 100. The allowable L_a for PVNGS-1 is 0.10 percent by weight of the containment air per 24 hours at P_a , where P_a is defined as the calculated peak internal containment pressure related to the design basis accident, specified in the PVNGS-1 TS as 49.5 psig. The acceptance criteria for the Type A test is 75

percent of L_a or 0.075 percent by weight of the containment air per 24 hours at P_a .

In each of the two previous periodic ILRTs at PVNGS-1 (the results were 0.066 percent and 0.067 percent by weight of the containment air per 24 hours at P_a , respectively), the results obtained were below the test acceptance criteria of 75 percent of L_a or 0.075 percent by weight of the containment air per 24 hours at P_a , thereby, demonstrating that PVNGS-1 is a low-leakage containment.

The licensee performed a plant-specific study concluding that the extension of the Type A test has a negligible impact on overall risk. This study relied heavily on the existing Type B and C testing program which is not affected by this exemption, and will continue to effectively detect containment leakage.

Additionally, the licensee stated that its exemption request meets the requirements of 10 CFR 50.12, paragraphs (a)(2)(ii) (the underlying purpose of the regulation is achieved), and (a)(2)(iii) (compliance would result in undue hardship or other costs that are significantly in excess of those contemplated when the regulation was adopted), for the following reasons:

The licensee categorized mechanisms that could cause degradation of the containment into two types: (1) degradation due to work which is performed as part of a modification or maintenance activity on a component or system (activity based); or (2) degradation resulting from a time based failure mechanism (i.e., deterioration of the containment structure due to pressure, temperature, radiation, chemical or other such effects). To address the potential degradation due to an activity based mechanism, the licensee reviewed containment system related modifications performed since the last

Type A test. The licensee concluded that the modifications performed did not impact containment integrity, or the modifications have, or will be, tested adequately to ensure that there is no degradation from an activity based mechanism. In addition, the licensee maintains administrative controls which ensure that an appropriate retest, including local leak rate testing, if applicable, is specified for maintenance activities which affect primary containment integrity.

Regarding time based failure mechanisms, the licensee concluded that risk of a non-detectable increase in the primary containment leakage is considered negligible due to the 10 CFR Part 50, Appendix J, Type B and C testing program. The licensee stated that without actual accident conditions, structural deterioration is a gradual phenomenon which requires periods of time well in excess of the proposed 81-month test interval which would result by performing the third periodic Type A test during the sixth refueling outage in Unit 1. Other than accident conditions, the only external mechanism inducing stress of the containment structure is the test itself. The licensee maintains that the longer test interval would, therefore, lessen the frequency of stressing the containment.

Additionally, the licensee has performed the general inspections of the accessible interior and exterior surfaces of the containment structures and components prior to the previous Type A tests, as required by 10 CFR Part 50, Appendix J, Section V.A. These inspections are intended to uncover any evidence of structural deterioration which may affect either the containment structural integrity or leak tightness. At PVNGS-1, there has been no evidence of structural deterioration that would impact structural integrity or leak tightness. In a phone conversation with the licensee on March 23, 1995,

the staff noted that these inspections, though limited in scope, provide an important added level of confidence. The licensee committed to perform the general containment civil inspection during the upcoming refueling outage (1R5).

The 10 CFR Part 50, Appendix J, Type B tests are intended to detect local leaks and to measure leakage across pressure containing or leakage limiting-boundaries other than valves, such as containment penetrations incorporating resilient seals, gaskets, doors, hatches, etc. The 10 CFR Part 50, Appendix J, Type C tests are intended to measure reactor system primary containment isolation valve leakage rates. The frequency and scope of Type B and C testing is not being altered by this proposed exemption request. The acceptance criterion for Type B and C testing is $0.6 L_a$. This acceptance criterion is for the sum of all valves and penetrations subject to Type B and C testing and represents a considerable portion of the Type A test allowable leakage. The results of the as-left combined Type B and C leakage measured since the last Unit 1 Type A test are $0.054 L_a$, $0.06 L_a$, and $0.13 L_a$ (for the February 1991, May 1992, and November 1993 outages, respectively). The licensee maintains that these test results are substantially below the acceptance criterion of $0.60 L_a$ and demonstrate a good historic performance of containment integrity.

The proposed schedular exemption would allow the third Type A leakage rate test in Unit 1 to be performed during the Fall 1996 (1R6) refueling outage, which meets the 10 CFR Part 50, Appendix J, requirement of performing three tests in a 10-year time period. The performance of a fourth Type A test during the Unit 1 seventh refueling outage, in order to coincide with the outage at the completion of the extended 10-year ISI interval, is not deemed

to be appropriate, as it would result in additional radiation exposure to personnel, increased length of the refueling outage and significant additional cost. Omitting the test will result in dose savings by eliminating contamination and by reducing radiation exposure from the venting and draining of piping penetrations necessary to establish the appropriate test conditions. There would also be dose savings from eliminating the need to install and remove the temporary instrumentation necessary to perform the Type A test. Performing a fourth Type A test would also increase the duration of the affected outage by approximately 3 days and result in additional costs associated with this increase.

A PVNGS-1 plant-specific analysis was performed to evaluate the potential for extending the Type A test frequency. The PVNGS-1 plant-specific analysis considered the extension of the interval to as much as 240 months. The conclusion of the analysis was that the extension of the Type A test interval has a negligible impact on overall risk. The licensee's exemption request does not alter the frequency for performance of Type A testing (i.e., it still maintains a frequency of 3 tests per 10 years). However, the licensee maintains that the data from this study support the requested exemption from the requirement of 10 CFR Part 50, Appendix J, regarding "approximately equal intervals." The interval between the second and third Type A tests would be 81 months with this exemption. The PVNGS-1 plant-specific analysis supports the use of a 240-month interval with a negligible impact on overall risk.

The licensee referenced 10 CFR 50.12(a)(2)(ii) as a basis for this exemption. This section defines such a circumstance where "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...." The underlying purpose of 10 CFR Part 50, Appendix J, Section III.D.1.(a), is to establish and maintain a level of confidence that any primary containment leakage, during a hypothetical design basis accident, will remain less than or equal to the maximum allowable value, L_a , by performing periodic Type A testing. Compliance with the "approximately equal intervals" clause of Appendix J is not necessary to achieve the underlying purpose of the rule, as explained in the above technical justification.

The licensee also referenced 10 CFR 50.12(a)(2)(iii) in its submittal, which states the NRC may grant exemptions from requirements of 10 CFR Part 50 when "compliance would result in undue hardship or other costs that are significantly in excess of those contemplated when the regulation was adopted, or that are significantly in excess of those incurred by others similarly situated...." The current PVNGS-1 Type A test schedule would require that four Type A tests be performed in an extended ISI interval. This current schedule would result in unnecessary additional radiation exposure in order to perform the test and unnecessary costs associated with the performance of the test and the costs associated with the increase in the length of the refueling outage. Regarding the impact of this exemption on overall risk, it is the staff's experience that risk is insensitive to the Type A test frequency at values of leakage close to L_a . Therefore, while the staff agrees with the licensee's conclusion that the risk increase resulting from granting this exemption is small, the time interval has no particular significance. Additionally, the staff has previously discussed with the licensee that its scheduling of containment ILRTs early in the ISI interval is largely responsible for the necessity of performing an additional test, and would not constitute a hardship that was not anticipated at the time the rule was

written. Therefore, the staff has reviewed this exemption request against the criteria of 10 CFR 50.12(a)(2)(ii).

IV.

Section III.D.1.(a) of Appendix J to 10 CFR Part 50 states that a set of three Type A leakage rate tests shall be performed at approximately equal intervals during each 10-year service period.

The licensee proposes an exemption to this section which would provide a one-time interval extension for the Type A test by approximately 20 months. Additionally, for schedular reasons, the final Type A test of the 10-year inservice inspection period is proposed to be decoupled from the requirement to perform it during the same outage (the final Type A test would be performed the outage prior (1R6) to the end of the inservice inspection period).

The Commission has determined that, pursuant to 10 CFR 50.12(a)(1), this exemption is authorized by law, will not present an undue risk to the public health and safety, and is consistent with the common defense and security. The Commission further determined, for the reasons discussed below, that special circumstances, as provided in 10 CFR 50.12(a)(2)(ii), are present justifying the exemption; namely, that application of the regulation in the particular circumstances is not necessary to achieve the underlying purpose of the rule. The underlying purpose of the requirement to perform Type A containment leak rate tests at intervals during the 10-year service period, is to ensure that any potential leakage pathways through the containment boundary

are identified within a time span that prevents significant degradation from continuing or becoming unknown. The NRC staff has reviewed the basis and supporting information provided by the licensee in the exemption request. The NRC staff has noted that the licensee has a good record of ensuring a leak-tight containment. All Type A tests have passed with adequate margin. The licensee has also noted that the results of the Type A testing have been confirmatory of the Type B and C tests (which will continue to be performed). Additionally, the licensee has committed to perform the general containment civil inspection during the upcoming refueling outage (IR5), thereby providing an added level of confidence in the continued integrity of the containment boundary.

The NRC staff has also made use of a draft staff report, NUREG-1493, which provides the technical justification for the present Appendix J rulemaking effort which also includes a 10-year test interval for Type A tests. The integrated leakage rate test, or Type A test, measures overall containment leakage. However, operating experience with all types of containments used in this country demonstrates that essentially all containment leakage can be detected by local leakage rate tests (Type B and C). According to results given in NUREG-1493, out of 180 ILRT reports covering 110 individual reactors and approximately 770 years of operating history, only 5 ILRT failures were found which local leakage rate testing could not detect. This is three percent of all failures. This study agrees with previous NRC staff studies which show that Type B and C testing can detect a very large percentage of containment leaks. The PVNGS-1 experience has also been consistent with this.

The Nuclear Management and Resources Council (NUMARC), now the Nuclear Energy Institute (NEI), collected and provided the NRC staff with summaries of data to assist in the Appendix J rulemaking effort. NUMARC collected results of 144 ILRTs from 33 units; 23 ILRTs exceeded $1.0 L_a$. Of these, only nine were not due to Type B or C leakage penalties. The NEI data also added another perspective. The NEI data show that in about one-third of the cases exceeding allowable leakage, the as-found leakage was less than $2 L_a$; in one case the leakage was found to be approximately $2 L_a$; in one case the as-found leakage was less than $3 L_a$; one case approached $10 L_a$; and in one case the leakage was found to be approximately $21 L_a$. For about half of the failed ILRTs, the as-found leakage was not quantified. These data show that, for those ILRTs for which the leakage was quantified, the leakage values are small in comparison to the leakage value at which the risk to the public starts to increase over the value of risk corresponding to L_a (approximately $200 L_a$, as discussed in NUREG-1493).

Based on generic and plant-specific data, the NRC staff finds the licensee's proposed one-time exemption to permit a schedular extension of one cycle for the performance of the Appendix Type A test, and the decoupling of the third test to be performed coincident with the completion of the inservice inspection period, to be acceptable.

Pursuant to 10 CFR 51.32, the Commission has determined that granting this exemption will not have a significant impact on the human environment (60 FR 16180).

This exemption is effective upon issuance and shall expire at the completion of the 1R7 refueling outage.

FOR THE NUCLEAR REGULATORY COMMISSION

ORIGINAL SIGNED BY:

Elinor G. Adensam, Acting Director
Division of Reactor Projects - III/IV
Office of Nuclear Reactor Regulation

Dated at Rockville, Maryland,
this 31st day of March 1995

Document Name: PV89112.EXE

*See previous concurrence

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