

August 16, 1995

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

SUBJECT: ISSUANCE OF EXEMPTION FROM THE REQUIREMENTS OF 10 CFR PART 50,
APPENDIX J, PALO VERDE NUCLEAR GENERATING STATION, UNIT NO. 3
(TAC NO. M92630)

Dear Mr. Stewart:

By letter dated June 21, 1995, Arizona Public Service Company (APS) requested a one-time scheduler exemption from 10 CFR Part 50, Appendix J, Section III.D.1.(a) for Palo Verde Nuclear Generating Station (PVNGS), Unit 3. The exemption request proposed that the containment integrated leakage rate test (CILRT or Type A test) be performed in April of 1997, during the sixth refueling outage (3R6) instead of the upcoming fifth refueling outage (3R5) as originally scheduled for the first plant 10-year inservice inspection (ISI) interval.

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
Charles R. Thomas, Project Manager
Project Directorate IV-2
Division of Reactor Projects III/IV
Office of Nuclear Reactor Regulation

Docket No. STN 50-530

Enclosure: Exemption

cc w/encl: See next page

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III.

By letter dated June 21, 1995, the licensee requested an exemption from the requirements of 10 CFR Part 50, Appendix J, Paragraph III.D.1.(a), on a one-time schedular extension which would permit rescheduling the second containment integrated leak rate test (ILRT) in the first 10-year service period from the fifth refueling outage (3R5) currently scheduled for November 1995 to the sixth refueling outage (3R6) planned for April 1997.

The current ILRT requirements for PVNGS, Unit 3, as set forth in Appendix J, are that, after the pre-operational leak rate test, a set of three Type A tests must be performed at approximately equal intervals during each 10-year period. Also, the third test of each set must be conducted when the plant is shut down for the 10-year plant inservice inspection (ISI). The first periodic Type A test was performed in May of 1991 during the second refueling outage in Unit 3 (3R2), 40 months from the date of Unit 3 commercial operation. The second periodic test is currently scheduled to be performed in November of 1995 during the fifth refueling outage (3R5), corresponding to an interval of 54 months. The third Type A test is currently planned to be performed during the seventh refueling outage (3R7) which would coincide with the completion of the first 10-year ISI interval.

The proposed exemption would allow APS to delay the Unit 3 second Type A test until the sixth refueling outage (3R6). The Type A test would tentatively be scheduled for April of 1997, and would increase the interval between the first and second Type A test from 54 months to 71 months. The third Type A test is not being altered by this exemption request and will remain scheduled for the seventh refueling outage (3R7). This exemption request proposes an increase to the interval between the first and second

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

In the Matter of)
ARIZONA PUBLIC SERVICE COMPANY, ET AL.) Docket No. STN 50-530
(Palo Verde Nuclear Generating Station,)
Unit No. 3))

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 (PVNGS), Unit No. 3. The license provides, among other things, that PVNGS, Unit 3, 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, Unit 3, 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.

Mr. William L. Stewart

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August 16, 1995

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Type A test but does not alter the frequency of testing (three Type A tests performed in a ten year period) during the first 10 year ISI interval.

IV.

The previous testing history at PVNGS, Unit 3, 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, Unit 3, 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 Part 100. The allowable L_a for PVNGS, Unit 3, 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 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 .

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).

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 71-month test interval which would result by performing the second periodic Type A test during 3R6. 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, Unit 3, there has been no evidence of structural deterioration that would impact structural integrity or leak tightness. Although the containment inspections required by Appendix J are limited in scope, they provide an important added level of confidence. The licensee has committed to perform the general containment inspection as originally scheduled, during the upcoming 3R5.

The preoperational and first periodic Type A tests performed in Unit 3 both passed the acceptance criteria with adequate margin. The test results were 0.0521 and 0.062 percent by weight of the containment air per 24 hours at P_a , respectively. The Type A test results were confirmatory of the Type B and C tests, and demonstrate that PVNGS Unit 3 is a low-leakage containment. A test report for each of the Type A tests was submitted to the Commission for staff review in accordance with the reporting requirements of 10 CFR 50, Appendix J, Section V.B.

The 10 CFR 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 50, Appendix J, Type C tests are intended to measure primary containment isolation valve

leakage rates. The frequency and scope of Type B and C testing are not being altered by this proposed exemption request. The acceptance criteria for Type B and C testing is $0.6 L_a$, or 0.06 percent by weight of the containment air per 24 hours at P_a . This acceptance criteria ($0.6 L_a$) 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 test results of the combined Type B and C leakage rates for Unit 3 were shown in a table on the licensee's exemption request submittal.

The Unit 3 test results are substantially below the allowable acceptance criteria for the combined Type B and C leakage rates. These test results demonstrate a good historic performance of the containment integrity system. The Type B and C testing program is not being altered by this exemption request and will continue to effectively detect containment leakage caused by activity based or time based failure mechanisms.

A plant-specific analysis for PVNGS was performed to evaluate the potential for extending the Type A test frequency. The PVNGS, Unit 3, 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 first and

second Type A tests would be 71 months with this exemption. The PVNGS, Unit 3, 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.

V.

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 inspection during the upcoming refueling outage (3R5), 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-3 experience has also been consistent with this.

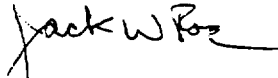
The Nuclear Management and Resources Council (NUMARC), now the Nuclear Energy Institute (NEI), collected and provided the NRC staff with summaries of data to assist in the Appendix J rulemaking effort. NUMARC collected results of 144 ILRTs from 33 units; 23 ILRTs exceeded $1.0 L_a$. Of these, only nine 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 that the licensee's proposed one-time exemption allowing APS to delay the Unit 3 second Type A test until the sixth refueling outage (3R6), which would increase the interval between the first and second Type A test from 54 months to 71 months, is 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 42189).

This exemption is effective upon issuance and shall expire at the completion of the 3R6 refueling outage.

FOR THE NUCLEAR REGULATORY COMMISSION



Jack W. Roe, Director
Division of Reactor Projects III/IV
Office of Nuclear Reactor Regulation

Dated at Rockville, Maryland,
this 16th day of August 1995