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SUBJECT: Forwards errata pages correcting error discovered in
supporting CEOG repts CE NPSD-994,CE NPSD--005 & CE NPSD-996
included w/950613 proposed amend to TS to extend allowed
action times for SITs,LPSI components & EDGs. O
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Arizona Public Service Company

PALO VERDE NUCLEAR GENERATING STATION
P.O. BOX 52034 • PHOENIX, ARIZONA 85072-2034

102-03449-AKK/SAB/GAM

August 16, 1995

U. S. Nuclear Regulatory Commission
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Reference: Letter No. 102-03392, dated June 13, 1995, from W. L. Stewart, Executive Vice President - Nuclear, APS, to NRC, "Proposed Amendment to Technical Specification Sections 3.5.1, 3.5.2, 3.7.11, 3/4.8.1.1, and Bases"

Dear Sirs:

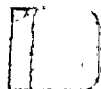
**Subject: Palo Verde Nuclear Generating Station (PVNGS)
Units 1, 2, and 3
Docket Nos. STN 50-528/529/530
Supplement to Proposed Amendment to Technical Specification
Sections 3.5.1, 3.5.2, 3.7.11, 3/4.8.1.1, and Bases**

Arizona Public Service Company submitted a proposed amendment to PVNGS Units 1, 2, and 3 Technical Specifications (TS) Sections 3.5.1, 3.5.2, 3.7.11, 3/4.8.1.1, and Bases (referenced above) to extend the allowed action times for safety injection tanks (SIT), low pressure safety injection (LPSI) components, and emergency diesel generators (EDG). The submittal included, as supporting documents in the enclosures, Combustion Engineering Owners Group (CEOG) Reports CE NPSD-994 (SIT Joint Applications Report), CE NPSD-995 (LPSI Joint Applications Report), and CE NPSD-996 (EDG Joint Applications Report). The TS amendment request is part of a collaborative effort of participating CEOG members.

Since the referenced TS amendment request was submitted, a number of typographical and transcription errors were discovered in each of the supporting CEOG reports. Enclosed with this letter are errata pages that correct these errors and also clarify the use of a specific methodology used by a participant in this joint effort (not PVNGS). The errata pages should be inserted into the front of each associated report. These corrections do not affect the conclusions of the No Significant Hazards Consideration Determination nor any other sections of the referenced letter.

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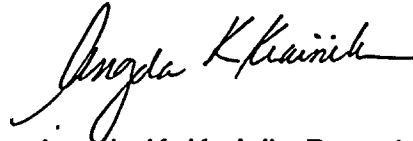


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Supplement to Proposed Amendment to TS
Page 2

Should you have any questions, please call Scott A. Bauer at (602) 393-5978.

Sincerely,

A handwritten signature in cursive script, appearing to read "Angela K. Krainik".

Angela K. Krainik, Department Leader
Nuclear Regulatory Affairs

AKK/SAB/GAM/rv

Enclosure: Errata Pages For CEOG Joint Applications Reports

cc: L. J. Callan
K. E. Perkins
B. E. Holian
K. E. Johnston
A. V. Godwin (ARRA)

ENCLOSURE

**ERRATA PAGES FOR CEOG
JOINT APPLICATIONS REPORTS**



Errata

SIT Joint Applications Report, CE NPSD-994

1. Page 14, *6.3.2 Assessment of "At Power" Risk, Methodology*: first paragraph: after the second sentence ("The evaluation of the "at power" risk increment resulting from the extended SIT AOT was evaluated on a plant specific basis using the most current individual plant's Probabilistic Safety Analysis (PSA) model.") the following sentence should have been inserted which reads:

For consistency in comparison of results, Core Damage Frequencies (CDFs) presented represent internal events only, excluding internal floods.

2. Page 15, A paragraph should have been inserted at the end of the *Methodology* subsection and prior to the *Calculation of Conditional CDF, Single and Yearly AOT Risk Contributions* subsection that reads:

The methodology used to calculate the above risk measures is presented below. For plants with PSAs that were quantified using RISKMAN methodology, equivalent steps were taken to meet the intent of the methodology presented below.

3. Page 25, Section 6.5.1, First Sentence: should not include the words "non-risk related". Sentence should read:

Section 7.4 of NUREG-1366 (Reference 1) provides the following justification for a specific AOT extension from 1 hour to 72 hours...

4. Page 28, Section 9.1, First paragraph, should not include sentences 2 through 4. Paragraph should read:

The PSA results from each of the CE PWRs show that the increment in risk at power due to one inoperable SIT is small for all plants. The major contributor to the differences in plant results for the SITs is the success criteria and frequency of a Large LOCA assumed in the PSA model. The results indicate that there is a lower risk to the plant by remaining at power to perform corrective maintenance than to shut down the plant to repair the inoperable SIT. Therefore, it is concluded that extending the AOT for one inoperable SIT from 1 to 24 hours would be risk beneficial.

5. Page 18, Table 6.3.2-1: The numerical values for "Increase in CDF, per year," for St. Lucie 1 and St. Lucie 2, should have been 2.0E-04 rather than 2.2E-04.

6/29/95

Errata
LPSI Joint Applications Report, CE NPSD-995

1. Page 1, Section 2.0, last sentence should read:

For the purposes of this report a LPSI train is defined as one pump, and associated flow paths and valves.

2. Page 5, *Shutdown Cooling System*, last paragraph, last sentence should read:

For most CE PWRs, the containment spray pump can be used in place of an inoperable LPSI pump for the function of shutdown cooling.

3. Page 12, *Steam Generator Tube Rupture (SGTR) Events*, last paragraph, last sentence should read:

Most CE PWRs also have the ability to realign the containment spray pumps to provide RCS shutdown cooling capability.

4. Page 16, *6.3.2 Assessment of "At Power" Risk, Methodology*: first paragraph: after the second sentence ("The evaluation of the "at power" risk increment resulting from the extended LPSI System AOT was evaluated on a plant specific basis using the most current individual plant's Probabilistic Safety Analysis (PSA) model for their respective baselines.") the following sentence should have been inserted which reads:

For consistency in comparison of results, Core Damage Frequencies (CDFs) presented represent internal events only, excluding internal floods.

5. Page 18, A paragraph should have been inserted at the end of the *Methodology* subsection and prior to the *Calculation of Conditional CDF, Single and Yearly AOT Risk Contributions* subsection that reads:

The methodology used to calculate the above risk measures is presented below. For plants with PSAs that were quantified using RISKMAN methodology, equivalent steps were taken to meet the intent of the methodology presented below.

BAM
8/17/95

1. Page 18, 6.3.2 *Assessment of "At Power" Risk, Methodology*: first paragraph: after the second sentence ("The evaluation of the "at power" risk increment resulting from the extended EDG AOT was evaluated on a plant specific basis using the most current individual plant's Probabilistic Safety Analysis (PSA) model for their respective baselines.") the following sentence should have been inserted which reads:

For consistency in comparison of results, Core Damage Frequencies (CDFs) presented represent internal events only, excluding internal floods.

2. Page 19, Increase in Core Damage Frequency definition: The terms "always available", and "perfect" should be "not out for Test or Maintenance (T/M)". Definition should read:

Increase in Core Damage Frequency (ΔCDF): The increase in CDF represents the difference between the CCDF evaluated for one train of equipment unavailable minus the CCDF evaluated for one train of equipment not out for test or maintenance (T/M). For the EDGs:

$$\Delta CDF = \text{Conditional CDF}_{(1 \text{ EDG unavailable})} - \text{Conditional CDF}_{(1 \text{ EDG not out for T/M})}$$

where CDF = Core Damage Frequency (per year)

3. Page 19, A paragraph should have been inserted at the end of the *Methodology* subsection and prior to the *Calculation of Conditional CDF, Single and Yearly AOT Risk Contributions* subsection that reads:

The methodology used to calculate the above risk measures is presented below. For plants with PSAs that were quantified using RISKMAN methodology, equivalent steps were taken to meet the intent of the methodology presented below.

4. Page 20: Second to the last paragraph, first sentence: The word "never" should have been "not". The sentence should read: The Conditional CDF given 1 EDG is not out for test or maintenance was obtained by setting the basic event probability for the failure mode for an EDG equal to 0.0, and requantifying the PSA cutsets.
5. Page 23, Last Paragraph, fifth line, the baseline CDF value should be 1.54E-05 per year rather than 1.54E-06 per year.
6. Pages 24 - 26, Tables 6.3.2-1 through 6.3.2-3 should be replaced by attached pages. This corrects a numerical value (Table 6.3.2-1, page 24, Waterford 3 Single AOT Risk, Proposed, 10 day should be 3.86E-06 rather than 1.55E-06) as well as typographical errors.
7. Page 26, Last Footnote should refer to page 23 not page 25.
8. Page 31, *Results*, first sentence: "Table 6.3.5-1" should be "Table 6.3.4.1-1".
9. Page 32, *"At Power" Risk Assessment*, Last Paragraph, first sentence: "Table 6.3.4-1" should be "Table 6.3.4.2-1".
10. Page 33, *Shutdown Risk Assessment*, Last Sentence: "Table 6.3.4-2" should be "Table 6.3.4.2-2".
11. Page 35, First Paragraph, first sentence: "Table 6.3.4-2" should be "Table 6.3.4.2-2".

Table 6.3.2-1
CEOG AOT CONDITIONAL CDF CONTRIBUTIONS FOR EDGs - Corrective Maintenance

PARAMETER	ANO-2	Fort Calhoun	Maine Yankee	Millstone 2	Palisades	Palo Verde 1, 2, & 3	San Onofre 2 & 3	St. Lucie 1	St. Lucie 2	Waterford 3
EDG Success Criteria	1 of 2	1 of 2	1 of 2	1 of 2	1 of 2	1 of 2	1 of 2	1 of 2	1 of 2	1 of 2
Present AOT, days	3	7	7	3	7	3	3	3	3	3
Proposed AOT, days	7/10	7/10	7/10	7/10	7/10	7/10	7/10	7/10	7/10	7/10
Conditional CDF, per yr (1 EDG unavailable)	1.26E-04	5.28E-05	1.15E-04	9.43E-05	1.64E-04	2.43E-04	5.92E-05	5.9E-05	6.3E-05	1.56E-04
Conditional CDF, per yr (1 EDG not out for T/M)	3.27E-05	1.17E-05	7.36E-05	3.24E-05	5.00E-05	4.58E-05	2.69E-05	2.1E-05	2.3E-05	1.50E-05
Increase in CDF, per yr	9.30E-05	4.11E-05	4.14E-05	6.19E-05	1.14E-04	1.97E-04	3.23E-05	3.8E-05	4.0E-05	1.41E-04
Single AOT Risk, Current	7.65E-07	7.88E-07	7.94E-07	5.09E-07	2.19E-06	1.62E-06	2.65E-07	3.1E-07	3.3E-07	1.16E-06
Single AOT Risk, Proposed	7 day	1.78E-06	7.88E-07	7.94E-07	1.19E-06	2.19E-06	3.78E-06	6.19E-07	7.3E-07	7.7E-07
	10 day	2.55E-06	1.13E-06	1.13E-06	1.70E-06	3.12E-06	5.40E-06	8.85E-07	1.0E-06	1.1E-06
Downtime Frequency, per yr per diesel*	0.63	2.5	2.5	2.5	2.0	1.8	0.63	2.5	2.5	2.5
Yearly AOT Risk, Current, per yr/diesel**	4.78E-07	1.97E-06	1.98E-06	1.27E-06	4.37E-06	2.92E-06	1.66E-07	7.8E-07	8.2E-07	2.90E-06
Yearly AOT Risk, Proposed, per yr/diesel**	1.12E-06	1.97E-06	1.98E-06	2.97E-06	4.37E-06	6.81E-06	3.87E-07	1.8E-06	1.9E-06	6.76E-06
Actual Duration, hrs/event***	15	24	24	24	24	24	23.8	24	24	24
Single AOT Risk (based on actual duration)	1.61E-07	1.13E-07	1.13E-07	1.70E-07	3.12E-07	5.40E-07	8.78E-08	1.0E-07	1.1E-07	3.86E-07
Yearly AOT Risk/yr/diesel** (based on actual duration)	.00E-07	2.82E-07	2.84E-07	4.24E-07	6.25E-07	9.72E-07	5.48E-08	2.6E-07	2.7E-07	9.66E-07

* Generic data = 2.5 per yr per diesel

**Value presented for worst case diesel

*** Generic data = 24 hrs/event

Table 6.3.2-2
CEOG AOT CONDITIONAL CDF CONTRIBUTIONS FOR EDGs - Preventive Maintenance

PARAMETER	ANO-2	Fort Calhoun	Maine Yankee	Millstone 2	Palisades	Palo Verde 1, 2, & 3	San Onofre 2 & 3	St. Lucie 1	St. Lucie 2	Waterford 3
EDG Success Criteria	1 of 2	1 of 2	1 of 2	1 of 2	1 of 2	1 of 2	1 of 2	1 of 2	1 of 2	1 of 2
Present AOT, days	3	7	3	3	7	3	3	3	3	3
Proposed AOT, days	7/10	7/10	7/10	7/10	7/10	7/10	7/10	7/10	7/10	7/10
Conditional CDF, per yr (1 EDG unavailable)	1.01E-04	3.71E-05	1.13E-04	8.58E-05	1.57E-04	1.72E-04	5.41E-05	4.1E-05	4.7E-05	6.76E-05
Conditional CDF, per yr (1 EDG not out for T/M)	3.27E-05	1.17E-05	7.36E-05	3.24E-05	5.00E-05	4.58E-05	2.69E-05	2.1E-05	2.3E-05	1.50E-05
Increase in CDF, per yr	6.86E-05	2.54E-05	3.94E-05	5.34E-05	1.07E-04	1.26E-04	2.72E-05	2.0E-05	2.4E-05	5.26E-05
Single AOT Risk, Current	5.64E-07	4.87E-07	7.56E-07	4.39E-07	2.05E-06	1.04E-06	2.24E-07	1.6E-07	2.0E-07	4.32E-07
Single AOT Risk, Proposed 7 day	1.32E-06	4.87E-07	7.56E-07	1.02E-06	2.05E-06	2.42E-06	5.22E-07	3.8E-07	4.6E-07	1.01E-06
Single AOT Risk, Proposed 10 day	1.88E-06	6.96E-07	1.08E-06	1.46E-06	2.93E-06	3.46E-06	7.45E-07	5.4E-07	6.6E-07	1.44E-06
Downtime Frequency, per yr*	2.0	2.8	2.8	2.8	4.0	3.0	1.25	2.8	2.8	2.8
Yearly AOT Risk, Current, per yr/diesel**	1.13E-06	1.36E-06	2.12E-06	1.23E-06	8.21E-06	3.11E-06	2.79E-07	4.6E-07	5.5E-07	1.21E-06
Yearly AOT Risk, Proposed, per yr/diesel**	2.63E-06	1.36E-06	2.12E-06	2.87E-06	8.21E-06	7.26E-06	6.52E-07	1.1E-06	1.3E-06	2.82E-06
Proposed Downtime hrs/train/yr***	192	160	175	144	192	160	114.75	240	240	140
Actual Duration hrs/event****	96	57	63	51	48	53	92	86	86	50
Single AOT Risk (based on actual duration)	7.52E-07	1.66E-07	2.81E-07	3.14E-07	5.86E-07	7.68E-07	2.85E-07	2.0E-07	2.4E-07	3.00E-07
Yearly AOT Risk/yr/diesel** (based on actual duration)	1.50E-06	4.64E-07	7.87E-07	8.78E-07	2.35E-06	2.31E-06	3.56E-07	5.5E-07	6.6E-07	8.41E-07

* Generic data = 2.8 per yr per diesel
 **Values presented are for worst case diesel

*** Duration (hrs/event) = Proposed Downtime (hrs/yr)/Frequency (events/yr)
 **** Generic data = 220 hrs/yr/diesel

**Table 6.3.2-3
CEOG PROPOSED AVERAGE CDFs**

PARAMETER	ANO-2	Fort Calhoun	Maine Yankee	Millstone 2	Palisades	Palo Verde 1, 2, & 3	San Onofre 2 & 3	St. Lucie 1	St. Lucie 2	Waterford 3
EDG Success Criteria	1 of 2	1 of 2	1 of 2	1 of 2	1 of 2	1 of 2	1 of 2	1 of 2	1 of 2	1 of 2
Present AOT, days	3	7	7	3	7	3	3	3	3	3
Proposed AOT, days	7/10	7/10	7/10	7/10	7/10	7/10	7/10	7/10	7/10	7/10
Proposed Downtime, hrs/yr	219	220	235	168	240	220	220	264	264	200
Average CDF (base), per yr	3.28E-05	1.18E-05	7.40E-05	3.41E-05	5.15E-05	4.74E-05	2.74E-05	2.14E-05	2.35E-05	1.54E-05
Proposed Average CDF	3.50E-05**	1.27E-05**	7.45E-05	3.50E-05	5.28E-05	4.85E-05	2.86E-05	2.2E-05	2.4E-05	1.75E-05
Change factor from baseline CDF	1.07*** (1.05)	1.08*** (1.02)	1.01	1.03	1.03	1.02	1.04	1.02	1.02	1.14**** (1.078)

* Generic data = 220 hrs/yr/diesel

** The Proposed Average CDF presented here is based on using the full AOT whereas the baseline IPE Average CDF was based on actual plant data which had very little PM on line (see Table 5.2-1).

*** The Numbers in parenthesis represent % change from baseline IPE if the baseline IPE was evaluated over the full AOT.

**** See page 25 for discussion of results

