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SUBJECT: Forwards response to NRC 930226 request for addl info to
 complete review of TS amend re safety valve setpoint
 tolerances.

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May 13, 1993

WILLIAM F. CONWAY
EXECUTIVE VICE PRESIDENT
NUCLEAR

U. S. Nuclear Regulatory Commission
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Reference: Letter dated February 26, 1993, from C. M. Trammell, NRC, to W. F. Conway, APS

Dear Sirs:

Subject: Palo Verde Nuclear Generating Station (PVNGS)
Units 1, 2, and 3
Docket Nos. STN 50-528/529/530
Reply to NRC Request for Information
File: 93-070-026

The referenced letter requested Arizona Public Service Company (APS) to provide additional information to complete the NRC review of APS' request for a Technical Specification amendment related to safety valve setpoint tolerances. Enclosed is APS' response to your request for additional information.

If you have any questions, please contact Thomas R. Bradish at (602) 393-5421.

Sincerely,



WFC/TRB/RKR/rv

Enclosure

cc: J. B. Martin
J. A. Sloan

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ENCLOSURE

**APS RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION
FOR SAFETY VALVE SETPOINT TOLERANCES**

REPLY TO REQUEST FOR INFORMATION

NRC REQUEST #1

After the original application (November 13, 1990) was submitted to the NRC, the following documents were issued on the dates indicated:

- a. NRC Information Notice No. 89-90, Supplement 1, "Pressurizer Safety Valve Lift Setpoint Shift," April 3, 1991.
- b. LER 91-001, Unit 3, April 15, 1991, describing main steam safety valves (MSSVs) and pressurizer safety valves (PSVs) out of tolerance.
- c. APS letter of April 29, 1991, committing to adjust the safety valves to within ± 1 percent of the required nominal setpoint, "as left."
- d. LER 91-001, Revision 1, Unit 3, June 9, 1991, supplementing subitem b. above.
- e. LER 91-005, Unit 2, November 12, 1991, describing MSSVs out of tolerance, and including three revised assumptions to limit the calculated RCS peak pressure for the as-found setpoints on the safety valves.
- f. LER 91-005, Revision 1, December 4, 1991, supplementing subitem e. above, reporting PSVs out of tolerance.
- g. LER 92-004, Unit 1, April 7, 1992, reporting MSSVs and PSVs out of tolerance.
- h. Letter from APS to NRC dated May 14, 1992, replying to a request for information regarding concerns about the MSSVs.
- i. APS letter dated May 27, 1992, responding to the NRC staff's questions regarding the requested amendments.
- j. LER 92-004, Revision 1, June 24, 1992, supplementing subitem g. above.
- k. Letter from APS to NRC dated October 20, 1992, amplifying the information provided in subitem h. above.
- l. LER 92-005, Unit 3, November 18, 1992, reporting MSSVs and PSVs out of tolerance.

In light of the totality of additional information developed since the original application, APS is requested to review all of the above and inform the NRC if the basis for the

original request or the request itself has been or should be altered in any way in light of this information, or if the original request, as supplemented by references c. and i. above, remains fully relevant and valid in support of the requested amendment. In providing this statement, the basis for your conclusion should be provided.

APS RESPONSE

a. NRC Information Notice No. 89-90, Supplement 1, "Pressurizer Safety Valve Setpoint Shift," April 3, 1991, "...was issued to inform licensees about possible problems resulting from operating pressurizer safety valves (PSVs) in environments different from that used to establish the safety valve lift setpoints." Dresser and Wyle Laboratories developed the temperature profile for the PVNGS PSVs as part of the original certification criteria for the PSVs. Test facilities use the temperature profile for PSV testing and lift setpoint verification. To validate the original temperature profile, APS has installed temperature elements on the Unit 2 PSVs. APS will review the data from the temperature elements to validate or change the original temperature profiles. This may result in improvements to the testing program for the PSVs. Since the possible problems with the testing program for the PSVs identified in the NRC Information Notice have not been found to occur at PVNGS, the Information Notice does not affect the requested Technical Specification (TS) amendment.

b., d., e., f., g., j., and l.

These documents are Licensee Event Reports (LERs) that report Main Steam Safety Valve (MSSV) and PSV as-found lift setpoints outside the TS required tolerance of $\pm 1\%$. The information in these LERs helps to confirm the relevance of the requested TS amendment. There are no actions or information in the LERs that affect the requested TS amendment.

c. APS letter of April 29, 1991, commits to continue to adjust the safety valves to within $\pm 1\%$ of the required nominal setpoint, "as left," whether the TS tolerance is $\pm 1\%$ or $\pm 3\%$. This commitment clarifies the adjustment requirements for the safety valves and does not affect the TS amendment request.

h. APS letter of May 14, 1992, replied to a request for information regarding concerns received by the NRC. APS determined that the concerns were not substantiated. Therefore, this response does not affect the TS amendment request.

i. APS letter of May 27, 1992, responded to the NRC staff's questions regarding the requested TS amendments. The APS response supports the TS amendment request and provides additional information, discussion, and clarification based on the NRC staff's questions. Therefore, this response does not affect the TS amendment request.

- k. APS letter of October 20, 1992, provides additional information for one of the concerns in subitem h. above. APS determined there was no impact on plant safety based on this concern. Therefore, this response does not affect the TS amendment request.

APS has reviewed the above correspondence and determined that the original request, as supplemented by references c. and i. above, remains fully relevant and valid.

NRC REQUEST #2

In addition to the documents cited above, on August 20, 1992, APS submitted a revised analysis of a steam generator tube rupture event, including a commitment to operate with a reduced dose equivalent iodine limit pending a review of emergency operating procedures in comparison with the UFSAR analysis for this event. We need to understand the relevance of this letter to the steam generator tube rupture analysis presented in your application for amendment. Also, did the letter of August 20 use the same minimum feedwater flow of 650 gpm proposed in the amendment application? Is the analysis presented in the application still valid in light of the August 20 letter? Does the application need to be revised in any way at this time?

APS RESPONSE

APS' August 20, 1992 submittal ["Revision 1 to the Justification for Continued Operation - Steam Generator Tube Rupture Analysis Concerns (JCO-91-02-01)"] conservatively incorporates the proposed MSSV setpoint tolerances requested by the TS amendment. The JCO analysis applied a 3% tolerance in the negative direction (conservatively less than the minus 1% minimum tolerance in the TS amendment request) to maximize releases from the MSSVs during the early phase of the event. These releases end once operators have established a continuous steaming path through the Atmospheric Dump Valves. Therefore, the analysis in the August 20, 1992 APS submittal is conservative for the MSSV setpoint tolerances in the TS amendment request. In addition, the analysis in the August 20, 1992 APS submittal assumes the same minimum feedwater flow of 650 gpm, consistent with the TS amendment request.

The analysis presented in the TS amendment request is still valid. The August 20, 1992 APS submittal primarily addresses concerns regarding the timing of operator actions that may result due to actions in the emergency procedures for a Steam Generator Tube Rupture event. The changes to MSSV setpoints and minimum auxiliary feedwater flow, as reflected in the TS amendment request, are conservatively applied in the August 20, 1992 APS submittal with acceptable results. Therefore, the application does not need to be revised in any way.

NRC REQUEST #3

Your letter of May 27, 1992, presented two tables of safety valve as-found setpoints (see pp. 7-8). Is the data in these two tables based on testing experience beginning in 1987 and extending to the date of the letter, as suggested by the text preceding the tables? If so, what was the basis for selecting 1987 as the starting point? What would these tables look like if all data had been included from the first testing to the same point in time? Please provide them. If the tables do look different, what conclusion do you make in light of the difference?

Considering the additional test results discussed in item 1. above, we need an updated set of tables which reflects all testing experience for these valves, including the recent test results on Unit 3, which shows the tolerances in groups similar to the ones presented in the May 27 letter, but modified to:

- a. show whether the as-found lift setting was above or below the nominal setpoint.
- b. for all as-found lifts greater than three percent from nominal, please show higher categories (i.e., 3 to 4, 4 to 5, etc.) so we can learn both the direction and the magnitude of the deviation from nominal (i.e., eliminate the category >3 percent to show the value or range of deviation).
- c. please provide the algebraic average deviations from nominal setpoint of all lift tests tested in a group during each refueling outage.

APS RESPONSE

APS scheduled initial setpoint testing of the PSVs and MSSVs (following initial startup of Units 1, 2, and 3) to meet the requirements of ASME Section XI. APS performed initial PSV setpoint testing during the second refueling outage for Units 1 and 2, and the first refueling outage for Unit 3 (Unit 1 - April 1989, Unit 2 - April 1990, and Unit 3 - April 1989). APS performed initial MSSV setpoint testing during the first refueling outage for each Unit (Unit 1 - October 1987, Unit 2 - February 1988, and Unit 3 - April 1989). The following tables include the up to date testing experience for PSVs and MSSVs. The PSV and MSSV setpoint tolerance data and algebraic average deviation from the TS nominal setpoint use the as-found setpoint of each valve tested.

On March 29, 1993, APS Nuclear Regulatory Affairs personnel contacted Mr. Trammell of the NRC staff to confirm the mathematical method for determining the algebraic average deviation. Mr. Trammell stated that the algebraic average deviation was equal to the algebraic sum of the as-found tolerances for the valves tested in each group (Unit outage) divided by the total number of valves tested in the group.

PSV AND MSSV SETPOINT TOLERANCE DATA

PSV SETPOINT TOLERANCE DATA						
UNIT - TOTAL TESTED	> -2% AND < -1%	TS TOLERANCE ($\pm 1\%$)		> 1% AND < 2%	> 2% AND < 3%	> 3% AND < 4% **
		> -1% AND < 0	> 0 AND < 1%			
UNIT 1 - 8	0	2	2	3	0	1
UNIT 2 - 8	1	1	0	2	3	1
UNIT 3 - 12	0	3	3	0	2	4

** The maximum as-found setpoint tolerance was 3.66%.

MSSV SETPOINT TOLERANCE DATA										
UNIT - TOTAL TESTED	< -3%	> -3% AND < -2%	> -2% AND < -1%	TS TOLERANCE ($\pm 1\%$)		> 1% AND < 2%	> 2% AND < 3%	> 3% AND < 4%	> 4% AND < 5%	> 5%
				> -1% AND < 0	> 0 AND < 1%					
UNIT 1 - 80	2 (-5.2% & -5.7%)	0	2	11	29	27	4	2	3	0
UNIT 2 - 100	0	1	8	18	34	27	9	2	1	0
UNIT 3 - 80	0	3	8	13	28	19	5	3	0	1 (6.1%)

PSV AND MSSV DEVIATION FROM NOMINAL SETPOINT

PSV DEVIATION FROM NOMINAL SETPOINT		
UNIT - DATE OF REFUELING OUTAGE PSVs TESTED		ALGEBRAIC AVERAGE DEVIATION FROM NOMINAL SETPOINT OF LIFT SETPOINTS TESTED
UNIT 1	APRIL 1989	1.7%
	MARCH 1992	0.4%
UNIT 2	APRIL 1990	2.5%
	OCTOBER 1991	0.6%
UNIT 3	APRIL 1989	2.2%
	APRIL 1991	2.2%
	OCTOBER 1992	0.4%

MSSV DEVIATION FROM NOMINAL SETPOINT		
UNIT - DATE OF REFUELING OUTAGE MSSVs TESTED		ALGEBRAIC AVERAGE DEVIATION FROM NOMINAL SETPOINT OF LIFT SETPOINTS TESTED
UNIT 1	OCTOBER 1987	0.4%
	APRIL 1989	1.3%
	APRIL 1990	0.2%
	MARCH 1992	1.6%
UNIT 2	FEBRUARY 1988	1.3%
	JUNE 1989	-0.04%
	SEPTEMBER 1989	0.9%
	JULY 1990	0.5%
	OCTOBER 1991	0.9%
UNIT 3	FEBRUARY 1989	0.5%
	OCTOBER 1989	-0.02%
	MARCH 1991	0.5%
	OCTOBER 1992	1.3%

NRC REQUEST #4

In the recent LER for Unit 3 (reference 1), you stated that ". . .APS has started an enhanced preventive maintenance and testing program to remove approximately ten (10) MSSVs every other refueling outage. . . ." A telephone discussion with your staff on January 22, 1993, indicated that this statement should be corrected. Please provide the correct statement of your intent in this matter. A similar correction would seem to be appropriate to your letter of May 27, 1992 (page 6).

APS RESPONSE

Main Steam Safety Valves are tested per the requirements of the PVNGS TSs. TS 4.0.5.b requires MSSV testing at a frequency according to the surveillance intervals specified in Section XI of the ASME Boiler and Pressure Vessel Code and applicable Addenda. Section XI of the ASME Boiler and Pressure Vessel Code specifies a 5 year surveillance interval for the PVNGS MSSVs. Based on the cycle length between refueling outages at PVNGS, testing ten (10) MSSVs every other refueling outage, meets the 5 year surveillance interval as specified in Section XI of the ASME Boiler and Pressure Vessel Code. Therefore, the May 27, 1992 letter does not need to be corrected.

However, due to the tendency toward setpoint drift (greater than the $\pm 1\%$ tolerance), APS has administratively shortened the testing interval for MSSVs until a longer interval is determined to be appropriate. Following the 1993 Unit 2 refueling outage, approximately ten (10) MSSVs will be tested every refueling outage in accordance with the enhanced preventive maintenance and testing program for MSSVs. The number of valves required to be tested may be revised in the future, based on an evaluation of results of the safety valve testing and the TS Surveillance requirements. The change in Unit 2 MSSV testing has been included in a supplement to Unit 3 LER 92-005.

NRC REQUEST #5

In your letter of May 27, 1992, response to NRC question no. 3, you indicated that the use of the "Trevitest" was to be discontinued, in favor of testing at an offsite facility. Your LER for Unit 3 dated November 18, 1992, indicates that Trevitest is planned for the MSSVs for Unit 2 for the upcoming spring outage. While we recognize that your program for improving the performance of the safety valves is evolving, NRC could benefit from a review of the history of the enhanced program for all the units, including a description of the two phases it contains, and where it stands today.

APS RESPONSE

In the Fall of 1987, during the first Unit 1 refueling outage, APS tested MSSVs using Trevitest in situ testing. APS continued to use Trevitest in situ testing for MSSVs through 1990. In 1991, APS implemented the enhanced preventive maintenance and testing program for MSSVs. The enhanced preventive maintenance and testing program for MSSVs includes disassembly and inspection of the valves. The MSSVs are recertification tested following reassembly. The MSSV preventive maintenance and testing is performed during a Unit's refueling outage. During this time, the MSSVs are not required and can be removed for preventive maintenance and testing. Therefore, it was more desirable to remove the MSSVs and send them to an offsite facility for preventive maintenance and testing. The offsite facility tests the MSSVs under controlled conditions, using live steam, both before (as-found) and after (recertification) preventive maintenance. At the same time, because of the continuing problem with setpoint drift, APS engineering personnel were concerned about the accuracy of the Trevitest results.

The initial phase of the enhanced preventive maintenance and testing program for MSSVs required that all MSSVs be sent to an offsite facility for disassembly, inspection, maintenance, and testing. Unit 2 has the last group of MSSVs requiring disassembly, inspection, maintenance, and testing during the initial phase of the enhanced preventive maintenance and testing program for MSSVs. The initial phase of the enhanced preventive maintenance and testing program for MSSVs will be completed during the current Unit 2 refueling outage, when the Unit 2 MSSVs are returned from the offsite facility. For the next phase of the enhanced preventive maintenance and testing program for MSSVs, approximately ten (10) MSSVs will be tested every refueling outage. APS will determine the number of valves required to be tested in the future based on an evaluation of results of the safety valve testing and the TS Surveillance requirements.

During the Summer of 1992, APS met with Trevitest to discuss the upgraded Trevitest methodology for in situ testing of safety valves. The upgraded Trevitest methodology is to provide test results as accurate as those from test facilities using live steam. An advantage of in situ testing is that the valves are tested in place under the actual operating conditions for the valve. Trevitest was originally scheduled to demonstrate/validate its upgraded methodology prior to the Unit 2 Spring refueling outage. Based on

this schedule, APS was planning to use the upgraded Trevitest methodology to test in situ some of the MSSVs that had been tested offsite during the last Unit 2 refueling outage. However, Trevitest has not yet demonstrated/validated the upgraded Trevitest methodology and Unit 2 is sending all 20 MSSVs offsite for testing. The change in Unit 2 MSSV testing has been included in a supplement to Unit 3 LER 92-005. APS still intends to use the upgraded Trevitest methodology during future refueling outages when it has been demonstrated to be comparable to the offsite testing using live steam.

