10 CFR 50.90

Palo Verde Nuclear Generating Station

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ATTN: Document Control Desk
U. S. Nuclear Regulatory Commission
Washington, DC 20555-0001

References: 1. Letter No. 102-05116-CDM/TNW/RAB, Dated July 9, 2004, from C. D. Mauldin, APS, to U. S. Nuclear Regulatory Commission, "Request for a License Amendment to Support Replacement of Steam Generators and Uprated Power Operations in Units 1 and 3, and Associated Administrative Changes for Unit 2"

2. Letter dated March 31, 2005 from J. A. Lyons, USNRC, to Mr. A. Marion, NEI, "Instrumentation, Systems, and Automation Society S67.04 Methods for Determining Trip Setpoints and Allowable Values for Safety-Related Instrumentation"

Dear Sirs:

Subject: Palo Verde Nuclear Generating Station (PVNGS)
Units 1 and 3, Docket Nos. STN 50-528 and STN 50-530
Response to Request for Additional Information Regarding Steam Generator Replacement and Power Uprate – Instrumentation and Controls Section

In Reference 1, Arizona Public Service Company (APS) submitted a license amendment request to support steam generator replacement and uprated power operations for PVNGS Units 1 and 3. In Reference 2, the NRC delineated what commitments and information licensees would need to provide, in addition to responding to the "Revised Method 3 Request for Additional Information" that was enclosed in the letter. This information would be needed for the staff to complete its review.

Reference 2 requested licensees to make specific regulatory commitments and to request a revision to the technical specifications Limiting Safety System Settings (LSSSs) being changed in Reference 1. The following commitments are being made to the NRC in this letter:

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1. APS shall continue to work with the industry on the finalization of the pending Technical Specification Task Force (TSTF) technical specification change and adopt the applicable changes to come into conformance with the existing understanding of the requirements of 10 CFR 50.36.

2. By separate letter, APS will request a revision to the technical specifications for the LSSSs being changed by Reference 1 to incorporate a footnote that states:

   > The as-left instrument setting shall be returned to a setting within the tolerance band of the trip setpoint established to protect the safety limit.

   The revision will be in accordance with Reference 2, and will be submitted by July 15, 2005.

Reference 1 requested a change to the Reactor Trip System (RPS)/Engineered Safety Feature Actuation System (ESFAS) associated with Steam Generator (SG) 1 - low and SG 2 - low functions allowable values from 890 psia to 955 psia. These changes are required due to the increased main steam pressure associated with Power Uprate (PUR) conditions. This constitutes the only LSSS being changed by this License Amendment Request (LAR) and the above footnote will be added to this parameter.

The specific Technical Specification (TS) Tables are:

- Table 3.3.1-1, Reactor Protective System Instrumentation, Steam Generator Pressure – Low
- Table 3.3.2-1, Reactor Protective System Instrumentation – Shutdown Table, Steam Generator Pressure – Low
- Table 3.3.5-1, Engineered Safety Features Actuation System Instrumentation, Main Steam Isolation Signal, Steam Generator Pressure – Low

It should be noted that TS Table 3.7.1-1, Variable Overpower Trip (VOPT) Setpoint versus Operable Main Steam Safety Valves will be revised. This revision is required for units licensed to operate at 3990 MW_t Rated Thermal Power (RTP), to decrease the Maximum Power and the Maximum Allowable VOPT Setpoint when the Minimum Number of Main Steam Safety Valves (MSSVs) per Steam Generator Required Operable is less than ten. Although the reduced VOPT setpoints in this table are not

units licensed to operate at 3990 MW_t Rated Thermal Power (RTP), to decrease the Maximum Power and the Maximum Allowable VOPT Setpoint when the Minimum Number of Main Steam Safety Valves (MSSVs) per Steam Generator Required Operable is less than ten. Although the reduced VOPT setpoints in this table are not being credited with protecting a safety limit and therefore are not considered LSSSs, the footnote will be added to this table also.

In addition, the PUR will increase Reactor Coolant System (RCS) average temperature (Tave) and Feedwater (FW) flowrates. Therefore, various control system tuning will be made. In addition, a change will be made to the Steam Bypass Control System (SBCS) master controller to maintain an adequate dead band within the controller with SG operating pressure. These control system tuning settings are also not considered LSSS.

The above TS changes and commitments are consistent with the current PVNGS setpoint methodology and the APS commitments to Regulatory Guide 1.105, Revision 1, "Instrument Setpoints."

Enclosure 1 provides a notarized affidavit.

Enclosure 2 to this letter provides the information requested in the enclosure to Reference 2.

Should you have any questions, please contact Thomas N. Weber at 623-393-5764.

Sincerely,

CDM/TNW/RAB/ca

Enclosures:

1. Notarized Affidavit
2. Instrumentation and Controls Section, Electrical and Instrumentation and Controls Branch Questions and APS Responses

cc:	B. S. Mallet	NRC Region IV
	M. B. Fields	NRC Project Manager
	G. G. Warnick	NRC Senior Resident Inspector for PVNGS
	A. V. Godwin	Arizona Radiation Regulatory Agency (ARRA)

Enclosure 1

Notarized Affidavit

STATE OF ARIZONA)
) ss.
COUNTY OF MARICOPA)

I, David Mauldin, represent that I am Vice President Nuclear Engineering and Support, Arizona Public Service Company (APS), that the foregoing document has been signed by me on behalf of APS with full authority to do so, and that to the best of my knowledge and belief, the statements made therein are true and correct.

David Mauldin

Sworn To Before Me This 19th Day Of July, 2005.

Susie Lynn Ergish
Notary Public

SUSIE LYNN ERGISH
Notary Public - Arizona
Maricopa County
My Comm. Expires Jul 14, 2007

Notary Commission Stamp

Enclosure 2

Instrumentation and Controls Section, Electrical and Instrumentation and Controls Branch Questions and APS Responses

REQUEST FOR ADDITIONAL INFORMATION ON PVNGS UNITS 1 AND 3
STRETCH POWER UPRATE FROM 3876 MW_t TO 3990 MW_t

REVISED METHOD 3 REQUEST FOR ADDITIONAL INFORMATION

The PVNGS technical specifications define Limiting Safety System Settings (LSSS) as an allowable value (AV). During reviews of proposed license amendments that contain changes to LSSS setpoints, the NRC staff identified concerns regarding the method used by some licensees to determine the allowable values (AV) identified in the technical specifications (TS). AVs are identified in the TS as LSSS to provide acceptance criteria for determination of instrument channel operability during periodic surveillance testing. The NRC staff's concern relates to one of the three methods for determining the AV as described in the Instrument Society of America (ISA) recommended practice ISA-RP67.04-1994, Part II, "Methodologies for Determination of Setpoints for Nuclear Safety-Related Instrumentation."

The NRC staff has determined that to ensure a plant will operate in accordance with the assumptions upon which the plant safety analyses have been based, additional information is required regardless of the methodology used to establish LSSS values in technical specifications. Details about the NRC staff's concerns are available on the NRC's public website under ADAMS Accession Numbers ML041690604, ML041810346, and ML050670025.

In Order for the NRC staff to assess the acceptability of your license amendment request related to this issue, the NRC staff requests the following additional information:

1. Discuss the setpoint methodology used at PVNGS to establish AVs associated with LSSS setpoints.

2. Regardless of the methodology used, the NRC staff has the following questions regarding the use of the methodology at PVNGS:

    a. Discuss how the methodology and controls you have in place ensure that the analytical limit (AL) associated with an LSSS will not be exceeded (the AL is a surrogate that ensures the safety limits will not be exceeded). Include in your discussion information on the controls you employ to ensure the trip setpoint established after completing periodic surveillances satisfies your methodology. If the controls are located in a document other than the TS, discuss how those controls satisfy the requirements of 10 CFR 50.36.

    b. Discuss how the TS surveillances ensure the operability of the instrument channel. This should include a discussion on how the surveillance test results relate to the technical specification AV and describe how these are used to determine the operability of the

instrument channel. If the requirements for determining operability of the LSSS instrument being tested are in a document other than the TS (e.g., plant test procedure), discuss how this meets the requirements of 10 CFR 50.36.

NRC QUESTION 1

Discuss the setpoint methodology used at PVNGS to establish AVs associated with LSSS setpoints.

APS RESPONSE

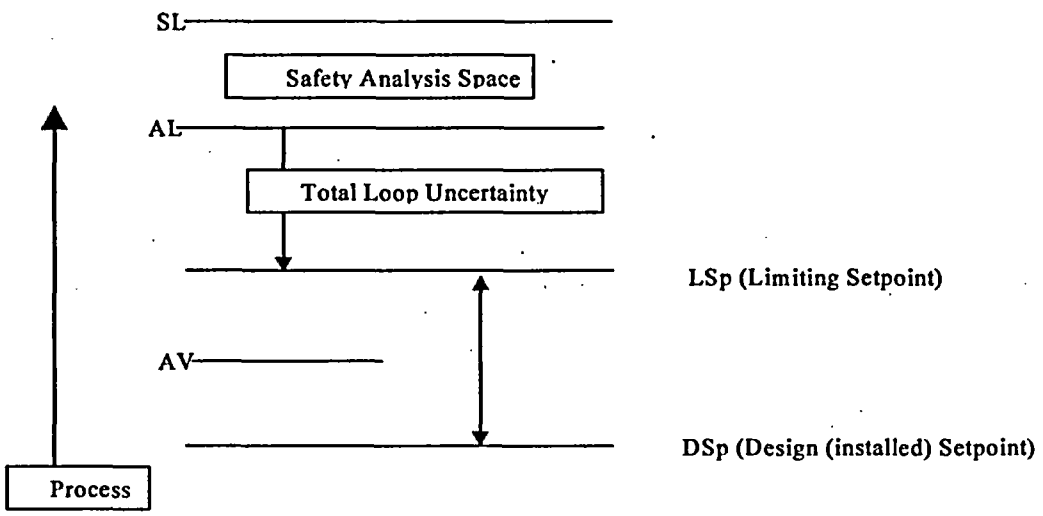
PVNGS is committed to RG 1.105 revision 1 with exceptions specified in the UFSAR, section 1.8, as a basis for meeting the requirements of 10CFR50, Appendix A, General Design Criteria 13 and 20. Our current practice provides more details than required by RG 1.105 revision 1. The setpoint project at PVNGS, by choice, used the principles of ANSI/ISA S67.04-1988, "Setpoints for Nuclear Safety-Related Instrumentation" and RP67.04 (then draft 9) in developing the design guide ("Design Guide for Instrument Uncertainty and Setpoint Determination" DSG-IC-0205) which was the method by which the calculations of the project were accomplished.

Of the three methods for determining the AV as described in Instrument Society of America (ISA) recommended practice ISA-RP67.04-1994, Part II, "Methodologies for Determination of Setpoints for Nuclear Safety-Related Instrumentation"; the PVNGS methodology is more similar to method 2 or 3, than method 1. This is because the total loop uncertainty (TLU), which is used to calculate a limiting (least conservative) setpoint (LSp), is determined by the Square Root Sum of the Squares combination of the COT (potential instrument uncertainties expected during Channel Operability Testing) and nCOT (composite of all other potential instrument uncertainties not addressed in the COT). Method 1 on the other hand, determines the TLU by adding the COT + nCOT.

The concern the Staff has (had) with respect to the ISA 67.04 Part II Method 3 is in the determination of the Allowable Value (AV). These concerns should not apply to the PVNGS methodology.

When PVNGS first developed the uncertainty and setpoint methodology and calculations, the Allowable Values listed in the Technical Specifications already existed based on the calculations provided by Combustion Engineering (CE). A goal of the PVNGS setpoint program was to clarify the methodology and resulting calculations, and if possible, avoid making changes to the existing Technical Specifications values or any field installed design setpoints (DSp) if the resulting calculations validated the existing values as conservative. The current PVNGS

calculations validate the existing Allowable Values. The Staff concern is that the methodology provides assurance that the AV is still satisfied by providing a large enough allowance for those uncertainties not measured during the operability test. The reason that the Staff finds either Method 1 or Method 2 acceptable is that the allowance between the Analytical Limit (AL) and the AV is defined by the magnitude of the nCOT. The PVNGS methodology and resulting calculation can demonstrate that the allowance between the AL and the AV exceeds the magnitude of the nCOT and that of the entire Total Loop Uncertainty (TLU) as well, for the LSSS value being changed under this LAR. The AL and thus, the associated Safety Limit (SL), will be preserved if a trip setpoint is found to be within the AV during surveillance testing. Therefore, operability is ensured in the Technical Specifications. The following figure shows these relative relationships (based on a rising process and high limit):



Total Loop Uncertainty = appropriate statistical combination of random and bias COT and nCOT terms..

NRC QUESTION 2a:

Discuss how the methodology and controls you have in place ensure that the analytical limit (AL) associated with an LSSS will not be exceeded (the AL is a surrogate that ensures the safety limits will not be exceeded). Include in your discussion information on the controls you employ to ensure the trip setpoint established after completing periodic surveillances satisfies your methodology. If the controls are located in a document other than the TS, discuss how those controls satisfy the requirements of 10 CFR 50.36.

APS RESPONSE

The PVNGS methodology determines that the field installed setpoint is conservative with respect to the calculated limiting setpoint required to ensure the AL associated with a specific LSSS will not be exceeded. The existing implementation requirement associated with the field installed setpoint is to ensure reset to within the as-left calibration tolerance after completing periodic surveillance tests. The bases for the as-left tolerance band for the instrument settings used in the periodic surveillances are calculated and documented within the design engineering uncertainty and setpoint calculations, based on the PVNGS methodology. It is a requirement to ensure the setpoint is within the as-left tolerance band to maintain the validity of the calculated total loop uncertainty which established the calculated limiting setpoint. It is the current practice of PVNGS and it is a requirement of PVNGS setpoint methodology to ensure the as-left value of the trip setpoint is adjusted as needed or left within this established tolerance band. If the setpoint can not be reset to within this tolerance, the periodic surveillance test procedures require the technician to notify the Control Room Supervisor/Shift Manager as soon as practical for determination of system/component operability. By ensuring that the set point is within the as-left tolerance band, as described above, APS satisfies the requirements of 10 CFR 50.36.

NRC QUESTION 2b:

Discuss how the TS surveillances ensure the operability of the instrument channel. This should include a discussion on how the surveillance test results relate to the technical specification AV and describe how these are used to determine the operability of the instrument channel. If the requirements for determining operability of the LSSS instrument being tested are in a document other than the TS (e.g., plant test procedure), discuss how this meets the requirements of 10 CFR 50.36.

APS RESPONSE

As stated previously, the PVNGS methodology determines that the field installed setpoint is conservative with respect to the calculated limiting setpoint required to ensure the AL associated with a specific LSSS will not be exceeded. The methodology also ensures that the calculated expected as-found tolerance during periodic surveillance testing associated with the field installed setpoint will not exceed the TS AV. The existing implementation requirement associated with the field installed setpoint is to ensure the expected performance via periodic surveillance test results. The bases for the as-found tolerance band for the instrument settings used in the periodic surveillances are calculated and documented within the design engineering uncertainty and setpoint calculations, based on the PVNGS methodology. It is a requirement to ensure the setpoint is within the as-found tolerance band to maintain the validity of the calculated total

loop uncertainty which established the calculated limiting setpoint. The as-found tolerance band is calculated based on a statistical combination of the following random components: as-left setting tolerance, measuring and test equipment, temperature effect, and drift for the instrument(s) under test. Testing period and environment are also considered. The most common causes of channel inoperability are outright failure or drift of the bistable or process module sufficient to exceed the as-found tolerance allowed by the specific setpoint calculation. Typically, the drift is found to be small and results in a delay of actuation rather than a total loss of function. Per the TS Bases, this determination is generally made during the performance of periodic surveillance tests when the process instrument is set up for adjustment to bring it to within specification. In accordance with TS SR 3.0.1, TS LCO 3.0.1 and TS LCO 3.0.2, if the as-found trip setpoint is less conservative than the TS Allowable Value, the channel is declared inoperable, and the appropriate Condition(s) must be entered. Requirements within the PVNGS Surveillance Testing Program state that if any as-found data is outside the expected performance tolerance, an Out Of Tolerance (OOT) is identified and used in the determination of system/component operability. The requirements of 10 CFR 50.36 are met by using the technical specifications to determine operability.