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Palo Verde Nuclear
Generating Station

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102-06390-DCM/DLK
August 12, 2011

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

- Reference:** (1) Letter No. 102-06341 from D.C. Mims to U.S. Nuclear Regulatory Commission (NRC), "Application for Technical Specification Change Regarding Risk-Informed Justification for the Relocation of Specific Surveillance Frequency Requirements to a Licensee-Controlled Program" dated March 31, 2011 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML11103A053)
- (2) NRC draft request for additional information (RAI) dated July 7, 2011 (ADAMS Accession No. ML111880954)

Dear Sirs:

Subject: Palo Verde Nuclear Generating Station Units 1, 2, and 3
Docket Nos. STN 50-528, 50-529, and 50-530
Response to Request for Additional Information (RAI) on License Amendment Request to Relocate Surveillance Frequencies to a Licensee-Controlled Program (TAC NOs. ME6010, ME6011, and ME6012)

By letter dated March 31, 2011 (Reference 1), Arizona Public Service Company (APS) submitted a license amendment request (LAR) to relocate certain surveillance frequencies to a licensee-controlled program in accordance with Technical Specification Task Force (TSTF) Traveler 425, "Relocate Surveillance Frequencies to Licensee Control-RITSTF (Risk Informed Technical Specification Task Force) Initiative 5b," (ADAMS Accession No. ML090850642). The enclosure to this letter contains the response to NRC draft RAI dated July 7, 2011 (Reference 2).

No commitments are being made to the NRC by this letter. Should you need further information regarding this response, please contact Russell A. Stroud, Licensing Section Leader, at (623) 393-5111.


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Response to RAI on LAR to Relocate Surveillance
Frequencies to a Licensee-Controlled Program
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I declare under penalty of perjury that the foregoing is true and correct.

Executed on August 12, 2011
(Date)

Sincerely,



FOR D.C. HIMS

DCM/RAS/DLK/gt

Enclosure: Response to Request for Additional Information (RAI) on License
Amendment Request (LAR) to Relocate Surveillance Frequencies to a
Licensee-Controlled Program

cc:

E. E. Collins Jr.	NRC Region IV Regional Administrator
L. K. Gibson	NRC NRR Project Manager for PVNGS
J. R. Hall	NRC NRR Senior Project Manager
M. A. Brown	NRC Senior Resident Inspector for PVNGS
A. V. Godwin	Arizona Radiation Regulatory Agency (ARRA)
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Enclosure

**Response to Request for Additional Information (RAI) on License
Amendment Request (LAR) to Relocate Surveillance
Frequencies to a Licensee-Controlled Program**

Introduction

By letter dated March 31, 2011 (Reference 1), Arizona Public Service Company (APS) submitted a license amendment request (LAR) to relocate certain surveillance frequencies to a licensee-controlled program in accordance with Technical Specification Task Force (TSTF) Traveler 425, "Relocate Surveillance Frequencies to Licensee Control-RITSTF (Risk Informed Technical Specification Task Force) Initiative 5b," (Reference 2).

The U.S. Nuclear Regulatory Commission (NRC) staff reviewed the information provided by APS and determined that the following additional information is needed to complete the review (References 3 and 4).

NRC Request 1

In Section 6 of Attachment 2 to the submittal [Reference 1] it is stated that PVNGS will follow the Nuclear Energy Institute (NEI) 04-10 [Reference 5] guidance to assess the fire and seismic risk associated with Surveillance Test Interval (STI) changes. However, the statement does not include other external events (e.g., high winds, external floods, transportation, nearby facility accidents) in the statement. Please clarify if Palo Verde Nuclear Generating Station (PVNGS) intends to follow NEI 04-10 [Reference 5] guidance to assess risk associated with these types of other external events as well. If not, what methodology would be used?

APS Response

PVNGS does not presently have an external events Probabilistic Risk Assessment (PRA) model. Until PVNGS has an external events PRA model that meets the Category II requirements of Regulatory Guide (RG) 1.200 (Reference 6) including peer review, the guidance in step 10 of NEI 04-10 (Reference 5) for "Initial Assessment for Other External Events" will be used. For example, APS will use the external hazards screening evaluation performed in support of the Individual Plant Examination of External Events (IPEEE) and ensure that the qualitative assessment is performed by personnel knowledgeable in the scope, level of detail, and assumptions of the external hazards evaluation.

NRC Request 2

The scope of risk assessments may need to include shutdown, using NEI 04-10 [Reference 5] guidance for STI changes. What shutdown risk method would be used for the analyses?

APS Response

PVNGS does not presently have a shutdown PRA model. Until PVNGS has a shutdown PRA model that meets the Category II requirements of RG 1.200 (Reference 6) including peer review, the guidance in step 10 of NEI 04-10 (Reference 5) for "Initial Assessment for Shutdown Events" will be used. For example, APS will utilize the defense-in-depth shutdown risk assessment process developed to support implementation of NUMARC 91-06 (Reference 7).

NRC Request 3

As noted in the submittal [Reference 1], "identifying plant changes that have been incorporated at the site, but are not yet in the PRA model and justifying why the changes do not impact the PRA results used to support the amendment request" is one aspect of the technical adequacy of the PVNGS PRA model used to support risk-informed applications. Please discuss PVNGS's approach to assessing plant changes not yet incorporated into the PRA model for this application.

APS Response

Procedure 70DP-0RA03, "Probabilistic Risk Assessment Model Control" (Reference 8), defines the process used for identifying and resolving potential impacts to the PRA Model. The PRA group performs monthly reviews of plant design changes and changes to other documents referenced in the PRA model documentation including procedures, drawings, engineering calculations, design basis manuals, and vendor drawings and manuals. PRA model impacts can originate from plant modifications, error corrections, procedure changes, plant data update and improved methods. When an impact to the PRA model is identified, the contributions to Core Damage Frequency (CDF) and Large Early Release Frequency (LERF) are prioritized for incorporation into the PRA model.

As part of the PRA evaluation for each STI change request, a review of open impacts will be performed and an assessment of the impact will be made prior to presenting the results of the risk analysis to the Independent Decision-making Panel (IDP). This assessment of impact will include individual and cumulative change in CDF and LERF applicable to the STI change request. Sensitivity analyses will be used to evaluate the affect of individual or cumulative impacts where the affects could lead to exceeding acceptance criteria for proposed STI change requests. These sensitivity analyses will be presented to the IDP.

NRC Request 4

The peer review found that the Category II requirement for SY-A4, given in Table 2, "RG 1.200 Category II Supporting Requirements Not Met Evaluation," was not met since walkdowns and interviews either were not conducted or not documented. It is not clear that walkdowns have been performed to confirm that the systems analysis correctly reflects the as-built, as-operated plant. As a specific example, the peer review observation in Table 1, "Open CEOG Internal Event PRA Peer Review F&Os [Findings and Observations]," for SY-03, sub-element SY-3, discusses observations from a walkdown performed for the Auxiliary Feedwater System, for which no specific evaluation is provided. More generally, the evaluation for the SY-A4 peer review finding does not explicitly mention that walkdowns were performed.

Please clarify if walkdowns have been conducted but not yet documented. If this is not the case, please provide justification as to why walkdowns are not necessary for this application or how the intent of the Supporting Requirement is met for this application. Also, specifically, please evaluate the importance of the peer review observations for SY-03, sub-element SY-3 for this application.

APS Response

Extensive plant walkdowns have been performed since 2003, with the most recent in 2010 and 2011, to support a variety of model upgrades and PRA applications. The model development/upgrades and PRA applications included:

- Risk-Informed In-Service Inspection Consequence Evaluations of Class 1 & 2 Piping (RI-ISI, Engineering Study 13-NS-C067 (Reference 9)) in 2003.
- Risk-Informed In-Service Inspection Break Exclusion Region Consequence Evaluation (RI-BER, Engineering Study 13-NS-C068 (Reference 10)) in 2003.
- Development of an Internal Fire PRA model in accordance with the EPRI Report TR-105928 (Reference 11) in 2004.
- Development of Internal Flooding PRA model to meet Category II requirements of RG 1.200, Rev. 2 (Reference 6) in 2010.
- Upgrade of the Internal Fire PRA model to meet Category II requirements in RG 1.200 Rev. 2 (Reference 6) in 2011.

Comprehensive walkdowns of the PRA modeled systems were performed in 2010 and 2011 for the Internal Flooding PRA development and Internal Fire PRA upgrade. The Internal Fire PRA upgrade walkdowns did not credit prior Internal Fire PRA walkdowns from 2004 and were sufficiently comprehensive to meet the Category II requirements of RG 1.200 (Reference 6). The Internal Flood PRA development and Internal Fire PRA upgrade walkdowns involved areas containing PRA modeled equipment including the following:

- Control Building
- Auxiliary Building

- Diesel Generator Building
- Turbine Building
- Yard (Outside yard areas and Condensate Tunnel)
- Main Steam Support Structure (MSSS)
- 140 foot Radwaste Building

The only areas of the plant containing PRA modeled equipment that were not walked down by the Internal Flood PRA development and Internal Fire PRA upgrade were:

- High Radiation Areas (HRA)
- Locked High Radiation Areas (LHRA)
- Contaminated Areas (CA)
- High Contaminated Areas (HCA) and,
- Inaccessible areas (e.g., Heating, Ventilation, and Air Conditioning intake duct structure for the Control Building)

The Internal Flooding PRA development and Internal Fire PRA upgrade walkdown documentation includes plant partitioning, source identification, barrier identification, assessment of plant and system design features, propagation paths, and the identification of susceptible systems, structures and components (SSC). The walkdowns included use of documentation sheets that listed PRA modeled components, spatial interaction, etc., in addition to pertinent observations.

Although the primary purpose of these walkdowns focused on aspects of floods and fires, these walkdowns had the secondary effect of verifying the accuracy and correctness of the PRA model. The Internal Fire PRA upgrade walkdowns had not been completed at the time the Risk Informed Technical Specification 5b application was submitted, but have since been completed and documented. These walkdowns did not identify errors in the internal events PRA model.

Further confidence in the PRA model and its use in this application comes from the following:

1. APS system engineers were involved in reviewing modeled components in their corresponding systems during the task of converting the PRA model into the "Equipment Out Of Service" (EOOS) software input used for Maintenance Rule (a)(4) risk assessments.
2. APS engineers are involved in scoping and risk-ranking of components as required by the Maintenance Rule. The system engineers reviewed the assignment of components to their system in the PRA model for the risk ranking in 2004.

Regarding F&O SY-3, this finding was resolved by performing thorough flow diversion analysis for PRA modeled systems. The flow diversion analyses are documented in the Risk Spectrum Memos for each applicable system. Therefore, the F&O SY-3 no longer represents a gap to complying with RG 1.200 (Reference 6) Category II requirements.

NRC Request 5

The peer review also noted for SY-C1 in Table 2 that "system studies have not been updated for several revisions of the model." The PVNGS evaluation of the peer review finding for SY-C1 Category II requirement apparently does not rely on the documentation of these [sic] system studies. While this is a documentation-related finding, it is not clear what impact out-of-date system studies have on the PRA model. Please assess the impact of the out-of-date system studies on the PRA model.

APS Response

To meet SY-C1 Category II, documentation must show the systems analysis was performed in a manner that facilitates PRA applications, upgrades, and peer reviews. The system studies refer to PRA system notebooks developed at the time of the IPE (Individual Plant Examination)/IPEEE. The modeling assumptions and references in these PRA system notebooks have been replaced with memos documented in the Risk Spectrum PRA model. The PRA model is no longer based on the system notebooks, but rather the Risk Spectrum Memos. The Risk Spectrum Memos do not contain simplified system drawings as expected in our system notebooks. Therefore, supporting requirement SY-C1 is not entirely met. Currently APS is transferring relevant information from the Risk Spectrum Memos into the EPRI PRA DocAssist documentation tool, from which system notebooks including simplified system drawings can be produced. In the interim, the Risk Spectrum Memos are considered adequate to document the PRA model for this application, because the memos are collected into a report to facilitate peer reviews and applications.

NRC Request 6

Do the failure probabilities of structures, systems, and components that are in standby mode for extended periods, as modeled in the PVNGS PRA, include a standby time-related contribution and a cyclic demand-related contribution? Please describe how you address the standby time-related contribution for extended surveillances.

APS Response

The failure probability of SSCs consists of a standby time-related contribution (i.e., latent or standby time-related failure rate) and a cyclic demand-related contribution (i.e., shock or demand stress failure probability). Since the failure probabilities in the PVNGS PRA model are based on the available industry data, they reflect either a latent or

shock-related probability, but typically not both. When determining the impact of the extension of a surveillance interval, the following PRA modeling practice will be used:

- Where the failure probability of an SSC is modeled with a standby time-related failure rate, the extended surveillance time interval can be applied directly to the failure probability calculation by changing the time interval. As a simplification, the increase in the test interval will be applied as a multiplier. For example, for a non-staggered surveillance, a surveillance being extended from 31 to 92 days would have its failure probability increased by a factor of 3.
- Where the failure probability of an SSC is modeled as a shock or demand-based failure probability, consistent with step 8 of NEI 04-10 (Reference 5), the impact of the extension will be conservatively applied as a multiplier to the shock-based failure probability. The failure probability will be increased by the multiple of the increase in the surveillance interval, similar to the standby time-based approach. For example, for a surveillance normally performed on a 31 day interval and extended to 92 days, the shock-based failure probability would be increased by a factor of 3.

References

1. Letter No. 102-06341 from D.C. Mims (APS) to NRC, "Application for Technical Specification Change Regarding Risk-Informed Justification for the Relocation of Specific Surveillance Frequency Requirements to a Licensee-Controlled Program" dated March 31, 2011 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML11103A053)
2. Technical Specification Task Force (TSTF) Traveler 425, "Relocate Surveillance Frequencies to Licensee Control-RITSTF (Risk Informed Technical Specification Task Force) Initiative 5b," (ADAMS Accession No. ML090850642)
3. NRC e-mail from Lauren Gibson to Russell Stroud, "Draft Request for Additional Information - Request to Relocate Surveillance Frequencies in Accordance with NEI 04-10 (TAC NOs. ME6010, ME6011, and ME6012), dated July 7, 2011 (ADAMS Accession Nos. ML111880948)
4. NRC draft request for additional information dated July 7, 2011 (ADAMS Accession Nos. ML111880954)
5. NEI 04-10, Rev. 1, "Risk-Informed Technical Specifications Initiative 5b, Risk-Informed Method for Control of Surveillance Frequencies"
6. Regulatory Guide 1.200, Revision 2, "An Approach for Determining the Technical Adequacy of Probabilistic Risk Assessment Results for Risk-Informed Activities"
7. NUMARC 91-06, "Guidelines for Industry Actions to Assess Shutdown Management, December 1991"
8. 70DP-0RA03, Rev. 9, "Probabilistic Risk Assessment Model Control"

9. 13-NS-C067, Rev. 2, "Risk-Informed In-Service Inspection Consequence Evaluation of Class 1 & 2 Piping for Palo Verde Nuclear Generating Station, Units 1, 2, and 3"
10. 13-NS-C068, Rev. 0, "Risk-Informed In-Service Inspection Break Exclusion Region (BER) Consequence Evaluation"
11. EPRI Report TR-105928, "Fire PRA Implementation Guide"