APS

Palo Verde Nuclear
Generating Station

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U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Mail Station P1-37
Washington, DC 20555-0001

Reference: Letter dated December 13, 2001, "Proposed License Amendment Request to Technical Specification 3.9.3, Containment Penetrations," C. D. Mauldin, APS to USNRC

Dear Sirs:

Subject: Palo Verde Nuclear Generating Station (PVNGS)
Units 1, 2, and 3
Docket Nos. STN 50-528/529/530
Response to Request for Additional Information on Proposed License Amendment to Technical Specification 3.9.3, Containment Penetrations

In the letter referenced above, Arizona Public Service Company (APS) requested an amendment to Technical Specification (TS) 3.9.3, Containment Penetrations. During the review, the NRC Staff requested additional information related to the proposed amendment. APS has provided the additional information requested in Enclosure 1 to this letter. Enclosure 2 contains an informational copy of the changes being made to the Technical Specification (TS) Bases for TS 3.9.3.

APS requests approval of the proposed amendment by August 30, 2002, with an allowance of 60 days for implementation of the approved amendment.

The following commitment is being made to the NRC in this letter:

The TS Bases and procedure changes required to support this amendment request will be completed prior to implementation of the approved technical specification change.

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

Sincerely,

David Mauldin

CDM/SAB/RJR/kg

A001

Enclosures:

cc:	E. W. Merschoff	(NRC Region IV)
	J. N. Donohew	(NRR Project Manager)
	J. H. Moorman	(NRC Resident Inspector)

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

David Mauldin

Sworn To Before Me This 1st Day Of May, 2002.

Nora E. Meador

Notary Public

My Commission Expires

April 6, 2003

"OFFICIAL SEAL"
Nora E. Meador
Notary Public-Arizona
Maricopa County
My Commission Expires 4/6/2003

ENCLOSURE 1

Response to Request for Additional Information
Proposed License Amendment to TS 3.9.3, Containment Penetrations

NRC Question 1

It is stated in Enclosure 2 to the application that "The typical time frame to close the open equipment hatch is less than one hour." Does this "less than one hour" include the installation of four bolts in the hatch? Provide the basis for the time to close [the] open equipment hatch.

APS Response

The "less than one hour" time frame referenced in the submittal does include the installation of four bolts to close the equipment hatch. The basis for the time to close was a timed demonstration conducted during a site refueling outage.

NRC Question 2

Discuss what equipment provides tornado missile protection through the equipment hatch for the inside of containment during refueling outages. Explain how this missile protection would ensure that the equipment needed to keep the reactor safely shut down is protected.

APS Response

The Containment Equipment Hatch inner cover is not credited for missile protection. For Modes 1 through 4, the missile shield outside the equipment hatch provides missile protection for equipment inside containment. For refueling (Mode 6), neither the missile shield nor the equipment hatch is needed for missile protection for equipment inside containment. UFSAR Section 3.5.2.2, Missile Barriers within Containment, describes the barriers that would provide protection if a tornado missile would enter containment through the equipment hatch opening. The secondary shield, the primary shield, the refueling cavity walls, the reactor vessel and pressurizer missile shields, the various structural beams, and the operating floor act as missile barriers separating each reactor coolant loop from other protected components and missile sources (UFSAR Figures 1.2-4 through 1.2-13). In Modes 5 and 6, there are no essential targets between the equipment hatch opening and the secondary shield. As stated in Section 4.0 "Technical Analysis" of Enclosure 2 to Reference 1, PVNGS has in place procedure 40AO-9ZZ21 "Acts of Nature" that addresses the actions to be taken in the event of actual or forecasted severe weather conditions, including tornado. The procedure contains actions to ensure the containment hatch is closed and that all fuel-handling operations are suspended.

NRC Question 3

Provide the dates of NRC letters (possibly amendments) that list the NRC-calculated potential consequences of the fuel handling accident (FHA) inside containment.

APS Response

A review of the PVNGS records did not identify any NRC letters where the NRC had indicated they performed a calculation of potential consequences from a fuel handling accident inside containment other than those done as part of the original licensing as identified in NUREG-0857.

NRC Question 4

Describe in general terms the administrative controls to close the equipment hatch within "less than one hour" in future refueling outages when the equipment hatch would be open, and there would be core alterations or irradiated fuel movement going on.

APS Response

APS' proposed amendment includes a specific surveillance requirement to verify the capability to close the equipment hatch. The bases for the new surveillance not only requires hardware, tools, and equipment be staged, but that personnel are also available to close the equipment hatch. Plant procedures will address appropriate personnel being made aware of the open status of the equipment hatch during core alterations and irradiated fuel movement. The new surveillance will include a check that obstructions of the hatch include provisions for rapid removal so that rapid closure of the hatch is not delayed.

NRC Question 5

It is requested that the general description of the administrative controls be listed in the Bases for the Technical Specifications 3.9.3, and that the description be added during the implementation of the amendments.

APS Response

PVNGS will add the following general description to the TS Bases:

The containment equipment hatch may be open during movement of irradiated fuel in containment and during CORE ALTERATIONS. Administrative controls ensure that 1) appropriate personnel are aware of the open status, 2) designated personnel are available to close the hatch, and 3) any obstruction(s) (e.g., cables, hoses, or temporary railings that could impede its closure) shall be capable of being quickly removed so the hatch is capable of being rapidly closed with a minimum of four bolts should a fuel handling accident occur inside containment.

The technical specification bases and procedure changes required to support this amendment request will be completed prior to implementation of the approved technical

specification change.

NRC Question 6

Describe the means, if any, to put the equipment hatch in place if there is station blackout.

APS Response

Portable generators are available for powering the hoists that lower the hatch cover.

ENCLOSURE 2
Technical Specification Bases B 3.9.3
(Information Only)

B 3.9 REFUELING OPERATIONS

B 3.9.3 Containment Penetrations

BASES

BACKGROUND

During CORE ALTERATIONS or movement of fuel assemblies within containment with irradiated fuel in containment, a release of fission product radioactivity within the containment will be restricted from escaping to the environment when the LCO requirements are met. In MODES 1, 2, 3, and 4, this is accomplished by maintaining containment OPERABLE as described in LCO 3.6.1, "Containment." In MODE 6, the potential for containment pressurization as a result of an accident is not likely; therefore, requirements to isolate the containment from the outside atmosphere can be less stringent. The LCO requirements are referred to as "containment closure" rather than "containment OPERABILITY." Containment closure means that all potential escape paths are closed or capable of being closed. Since there is no potential for containment pressurization, the Appendix J leakage criteria and tests are not required.

The containment serves to contain fission product radioactivity that may be released from the reactor core following an accident, such that offsite radiation exposures are maintained well within the requirements of 10 CFR 100. Additionally, the containment structure provides radiation shielding from the fission products that may be present in the containment atmosphere following accident conditions.

The containment equipment hatch, which is part of the containment pressure boundary, provides a means for moving large equipment and components into and out of containment. During CORE ALTERATIONS or movement of irradiated fuel assemblies within containment, the equipment hatch must be either closed or capable of being closed. When closed, the equipment hatch shall be held in place by at least four bolts. Good engineering practice dictates that the bolts required by this LCO be approximately equally spaced.

The containment air locks, which are also part of the containment pressure boundary, provide a means for personnel access during MODES 1, 2, 3, and 4 operation in accordance with LCO 3.6.2, "Containment Air Locks." Each air lock has doors at both ends. The doors are normally interlocked to prevent simultaneous opening when containment OPERABILITY is required. During periods of shutdown when containment

BASES

BACKGROUND (continued)

closure is not required, the door interlock mechanism may be disabled, allowing both doors of an air lock to remain open for extended periods when frequent containment entry is necessary. During CORE ALTERATIONS or movement of irradiated fuel assemblies within containment, containment closure is required; therefore, the door interlock mechanism may remain disabled, but one air lock door must always remain closed.

The requirements on containment penetration closure ensure that a release of fission product radioactivity within containment will be restricted from escaping to the environment. The closure restrictions are sufficient to restrict fission product radioactivity release from containment due to a fuel handling accident during refueling.

The Containment Purge and Exhaust System includes two subsystems. The refueling purge subsystem includes a 42 inch supply penetration and a 42 inch exhaust penetration. The second subsystem, power access purge subsystem, includes an 8 inch supply penetration and an 8 inch exhaust penetration. During MODES 1, 2, 3, and 4, the two valves in each of the refueling purge supply and exhaust penetrations are secured in the closed position. The two valves in each of the two power access purge penetrations can be opened intermittently, but are closed automatically by the Engineered Safety Features Actuation System (ESFAS). Neither of the subsystems is subject to a Specification in MODE 5.

In MODE 6, large air exchanges are necessary to conduct refueling operations. The refueling purge system is used for this purpose and the valves are closed by the ESFAS in accordance with LCO 3.3.8, "Containment Purge Isolation Actuation Signal (CPIAS)."

The Power Access Purge System remains operational in MODE 6 and the valves are also closed by the ESFAS.

The other containment penetrations that provide direct access from containment atmosphere to outside atmosphere must be isolated on at least one side. Isolation may be achieved by an OPERABLE automatic isolation valve, or by a manual isolation valve, blind flange, or equivalent.

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BACKGROUND (continued)

Equivalent isolation methods must be approved and may include use of devices designed to allow eddy current testing and sludge lancing of the steam generators. Devices which present a substantial restriction to the release of containment atmosphere may be considered equivalent.

APPLICABLE SAFETY ANALYSES

During CORE ALTERATIONS or movement of irradiated fuel assemblies within containment, the most severe radiological consequences result from a fuel handling accident. The fuel handling accident is a postulated event that involves damage to irradiated fuel (Ref. 2). Fuel handling accidents, analyzed in Reference 2, include dropping a single irradiated fuel assembly and handling tool or a heavy object onto other irradiated fuel assemblies. The requirements of LCO 3.9.6, "Refueling Water Level-Fuel Assemblies," LCO 3.9.7, "Refueling Water Level-CEAs," and the minimum decay time of 100 hours prior to CORE ALTERATIONS ensure that the release of fission product radioactivity, subsequent to a fuel handling accident, results in doses that are well within the guideline values specified in 10 CFR 100. The acceptance limits for offsite radiation exposure are contained in Standard Review Plan Section 15.7.4, Rev. 1 (Ref. 3), which defines "well within" 10 CFR 100 to be 25% or less of the 10 CFR 100 values.

Containment penetrations satisfy Criterion 3 of 10 CFR 50.36 (c)(2)(ii).

LCO

This LCO limits the consequences of a fuel handling accident in containment by limiting the potential escape paths for fission product radioactivity released within containment. The LCO requires any penetration providing direct access from the containment atmosphere to the outside atmosphere to be closed except for the OPERABLE containment purge supply and exhaust penetrations and equipment hatch. For the OPERABLE containment purge supply and exhaust penetrations, this LCO ensures that these penetrations are isolable by a valve in the Containment Purge Isolation System. The OPERABILITY requirements for this LCO ensure that the automatic purge valve closure times specified in the UFSAR can be achieved and therefore meet the assumptions used in the safety analysis to ensure releases through the valves are terminated, such that the radiological doses are within the acceptance limit. The equipment hatch is required to be closed as part of a containment evacuation.

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The containment equipment hatch may be open during movement of irradiated fuel in containment and during CORE ALTERATIONS. Administrative controls ensure that 1) appropriate personnel are aware of the open status, 2) designated personnel are available to close the hatch, and 3) any obstruction(s) (e.g., cables, hoses, or temporary railings that could impede its closure) shall be capable of being quickly removed so the hatch is capable of being rapidly closed with a minimum of four bolts should a fuel handling accident occur inside containment.

APPLICABILITY

The containment penetration requirements are applicable during CORE ALTERATIONS or movement of irradiated fuel assemblies within containment because this is when there is a potential for a fuel handling accident. In MODES 1, 2, 3, and 4, containment penetration requirements are addressed by LCO 3.6.1, "Containment." In MODES 5 and 6, when CORE ALTERATIONS or movement of irradiated fuel assemblies within containment are not being conducted, the potential for a fuel handling accident does not exist. Therefore, under these conditions no requirements are placed on containment penetration status.

ACTIONS

A.1 and A.2

With the containment equipment hatch, air locks, or any containment penetration that provides direct access from the containment atmosphere to the outside atmosphere not in the required status, including the Containment Purge Isolation System not capable of automatic actuation when the purge valves are open, the unit must be placed in a condition in which the isolation function is not needed. This is accomplished by immediately suspending CORE ALTERATIONS and movement of irradiated fuel assemblies within containment. Performance of these actions shall not preclude completion of movement of a component to a safe position.

SURVEILLANCE REQUIREMENTS

SR 3.9.3.1

This Surveillance demonstrates that each of the containment penetrations required to be in its closed position is in that position. The Surveillance on the open purge and exhaust valves will demonstrate that the valves are not blocked from closing. Also, the Surveillance will

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demonstrate that each valve operator has motive power, which will ensure each valve is capable of being closed by an OPERABLE automatic containment purge isolation signal.

SURVEILLANCE REQUIREMENTS

SR 3.9.3.1 (continued)

The Surveillance is performed every 7 days during CORE ALTERATIONS or movement of irradiated fuel assemblies within the containment. The Surveillance interval is selected to be commensurate with the normal duration of time to complete fuel handling operations. A surveillance before the start of refueling operations will provide two or three surveillance verifications during the applicable period for this LCO. As such, this Surveillance ensures that a postulated fuel handling accident that releases fission product radioactivity within the containment will not result in a release of fission product radioactivity to the environment.

SR 3.9.3.2

This Surveillance demonstrates that each containment purge valve actuates to its isolation position on manual initiation or on an actual or simulated high radiation signal. The 18 month Frequency maintains consistency with other similar ESFAS instrumentation and valve testing requirements. The CPIAS is tested in accordance with LCO 3.3.8, "Containment Purge Isolation Actuation Signal (CPIAS)." SR 3.6.3.5 demonstrates that the isolation time of each valve is in accordance with the Inservice Testing Program requirements. These surveillances performed during MODE 6 will ensure that the valves are capable of closing after a postulated fuel handling accident to limit a release of fission product radioactivity from the containment.

SR 3.9.3.3

This Surveillance not only demonstrates that the necessary hardware and tools are available to close the equipment hatch but ensures that 1) appropriate personnel are aware of the open status, 2) designated personnel are available to close the hatch, and 3) any obstruction(s) (e.g., cables, hoses, or temporary railings that could impede its

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closure) shall be capable of being quickly removed so the hatch is capable of being rapidly closed with a minimum of four bolts should a fuel handling accident occur inside containment. The 7-day Frequency is commensurate with the normal duration of time to complete the fuel handling operations. The Surveillance is only required to be met for an open equipment hatch. If the hatch is closed, the capability to close the hatch is not required.

REFERENCES

1. GPU Nuclear Safety Evaluation SE-0002000-001, Rev. 0, May 20, 1988.

2. UFSAR, Section 15.7.4.

3. NUREG-0800, Section 15.7.4, Rev. 1, July 1981.