Palo Verde Nuclear
Generating Station

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10 CFR 50.90
10 CFR 50.91

102-04701-CDM/SAB/TNW/RJR
May 15, 2002

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

Dear Sirs:

SUBJECT: **Palo Verde Nuclear Generating Station (PVNGS)**
Docket Nos. STN 50-528, 50-529, 50-530
Units 1, 2, and 3
Proposed License Amendment Request to Technical Specification 3.9.3, Containment Penetrations

Pursuant to 10 CFR 50.90, Arizona Public Service Company (APS) hereby requests the following two amendments to Technical Specification 3.9.3, Containment Penetrations, for Palo Verde Nuclear Generating Station Units 1, 2, and 3. The proposed amendments discussed in the enclosure would allow the personnel air locks and certain other penetrations to remain open during CORE ALTERATIONS or movement of irradiated fuel assemblies within containment under appropriate administrative controls. The changes are consistent with NRC approved Technical Specification Task Force (TSTF) Travelers, Number 68, Revision 2, "Containment Personnel Air Lock Doors Open During Fuel Movement" and Number 312, Revision 1, "Administratively Controlled Containment Penetrations." The NRC staff approved these TSTFs on August 16, 1999.

The proposed amendments are similar to the Wolf Creek Nuclear Operating Corporation amendments approved on September 12, 2000. APS requests approval of the proposed amendments by August 30, 2002, with an allowance of 60 days for implementation of the approved amendments. Technical Specification Bases and procedure changes required to support this change will be completed prior to implementation of the amendments.

Based on the responses to the three criteria provided in 10 CFR 50.92 "Issuance of Amendment," APS has concluded that the proposed amendments involve no significant hazards consideration.

A001

In accordance with the PVNGS Quality Assurance Program, the Plant Review Board and Offsite Safety Review Committee have reviewed and concurred with these proposed amendments. By copy of this letter, this submittal is being forwarded to the Arizona Radiation Regulatory Agency (ARRA) pursuant to 10 CFR 50.91(b)(1).

There are no commitments being made to the NRC by this letter. Should you have any questions, please contact Thomas N. Weber at (623) 393-5764.

Sincerely,

CDM/SAB/TNW/RJR/kg

Enclosures:
1. Notarized Affidavit
2. Evaluation of the proposed amendment request

Attachments:
1. Proposed Technical Specification Changes (mark-up)
2. Proposed Technical Specification Changes (retyped)
3. Associated Changes to The Technical Specification Bases (for information only)

cc: E. W. Merschoff (NRC Region IV) (all w/Attachment)
J. N. Donohew (NRR Project Manager)
J. H. Moorman (NRC Resident Inspector)
A. V. Godwin (ARRA)

STATE OF ARIZONA)
) ss.
COUNTY OF MARICOPA)

I, C. D. 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 D Mauldin
C. D. Mauldin

Sworn To Before Me This 15th Day Of May, 2002.

Dora 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 2

Evaluation of Proposed Amendment Request

Technical Specification 3.9.3, Containment Penetrations

Evaluation of Proposed Amendment Request
Technical Specification 3.9.3, Containment Penetrations

1.0 DESCRIPTION

This letter is a request to amend Operating Licenses NPF-41, NPF-51, and NPF-74 for Palo Verde Nuclear Generating Station Units 1, 2, and 3.

The first proposed amendment would revise the Limiting Condition for Operation (LCO) 3.9.3, Item (b) requiring one door in each personnel air lock to be "closed" to "is capable of being closed" during operations involving CORE ALTERATIONS or the movement of irradiated fuel in containment. This proposed amendment is consistent with NRC approved Technical Specification Task Force (TSTF) Traveler, Number 68, Revision 2, "Containment Personnel Air Lock Doors Open During Fuel Movement," which was approved on August 16, 1999.

The second proposed amendment would revise LCO 3.9.3, Item (c) by adding a NOTE to allow unisolating containment penetration flow path(s) under administrative controls during operations involving CORE ALTERATIONS or the movement of irradiated fuel in containment. This note would not apply to either the equipment hatch or the personnel air locks. This proposed amendment request is consistent with NRC approved TSTF Traveler Number 312, Revision 1, "Administratively Controlled Containment Penetrations." The NRC staff approved this TSTF on August 16, 1999.

APS has previously submitted an amendment request to LCO 3.9.3 Item (a) to allow the containment equipment hatch to remain open with the capability of being closed during operations involving CORE ALTERATIONS or the movement of irradiated fuel in containment. This request was submitted by letter 102-04630, "Proposed License Amendment Request to Technical Specification 3.9.3, Containment Penetrations," dated December 13, 2001 and supplemented by letter 102-04697, "Response to Request for Additional Information on Proposed License Amendment to Technical Specification Amendment 3.9.3, Containment Penetrations," dated May 1, 2002. Attachment 4 has been provided showing the pending changes from the previous request and the additional changes in this request as combined re-typed pages for TS LCO 3.9.3 a., b., and c

These proposed amendment requests are similar to the license amendments issued to the Wolf Creek Generating Station on September 12, 2000 and the Waterford Steam Electric Station, Unit 3 on October 2, 2000 as well as others identified in Section 7.0, References. APS requests approval of the proposed amendment by August 30, 2002, with an allowance of 60 days for implementation of the approved amendment.

2.0 PROPOSED CHANGE

Personnel Air Locks

The personnel air locks (2) provide a means for personnel access during MODES 1, 2, 3, and 4. The doors are normally interlocked to prevent simultaneous opening when containment OPERABILITY is required. During periods of shutdown when containment 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. The current TS requires containment closure during CORE ALTERATIONS or movement of irradiated fuel assemblies within containment, therefore, although the door interlock mechanism may remain disabled, one air lock door must always remain closed.

During refueling, a large number of personnel can be in containment at any given time. Should containment evacuation be required, such as during a Fuel Handling Accident (FHA), it would take a number of cycles of the air lock(s) to evacuate personnel from the containment. This could cause the workers waiting to exit to be unnecessarily exposed to any released activity or other hazardous material. Under the proposed change, allowing both air lock doors to be open, but with one door capable of being closed, containment could be evacuated more rapidly and efficiently. After evacuation is complete, one of the personnel air lock doors would then be closed and sealed. This would reduce the exposure to workers in the event of an accident while maintaining acceptable exposure to the public.

Additionally, it is expected that maintenance of the personnel air locks will also be reduced by limiting the number of open/close operations during a refueling as well as expediting the movement of personnel and equipment in and out of containment.

PVNGS is processing a supporting Technical Specification (TS) Bases change requiring that in the event of a FHA an open air lock can and will be promptly closed following containment evacuation. No other controls are considered necessary to implement this amendment.

Containment Penetrations

Palo Verde Nuclear Generating Station's (PVNGS) Technical Specification (TS) 3.9.3, "Containment Penetrations Limiting Condition for Operation" (LCO) Item (c) requires containment penetrations be closed or capable of being closed by an OPERABLE Containment Purge and Exhaust Isolation System during CORE ALTERATIONS or movement of irradiated fuel assemblies within containment. The proposed amendments would allow opening containment penetration flow path(s) under administrative controls.

TS 3.6.3, "Containment Isolation Valves," currently has a similar provision for temporarily opening containment penetration flow paths in MODES 1 through 4 under administrative controls. However, this allowance does not apply during refueling operations when the need for containment integrity is less. Because this allowance does not apply, some outage activities are interrupted while fuel handling activities or CORE ALTERATIONS are in progress. The proposed amendment to allow penetration flow paths to be opened under administrative controls will support the performance of other outage activities concurrent with fuel handling activities and allow for more efficient performance of outage work. The administratively controlled containment penetrations will continue to provide an acceptable barrier against the release of fission product radioactivity to the outside atmosphere during CORE ALTERATIONS or fuel handling activities inside containment.

PVNGS is processing a supporting TS Bases change requiring that in the event of a FHA, open penetrations can and will be promptly closed. These administrative controls will ensure that appropriate personnel are aware of the open status of the penetration flow path(s) during CORE ALTERATIONS or movement of irradiated fuel assemblies within containment and that designated individuals are readily available to isolate the flow path(s) in the event of a FHA.

In summary, these proposed amendments would allow the personnel air locks and certain other penetrations to remain open under appropriate administrative controls during CORE ALTERATIONS and movement of irradiated fuel in containment. Implementation of the proposed amendments also requires a change to TS Bases 3.9.3 in accordance with TSTFs 68 R2 and 312 R1.

3.0 BACKGROUND

The containment functions to contain fission product radioactivity that may be released from a reactor fuel assembly following a fuel handling accident, such that offsite radiation exposures are maintained well within the requirements of 10 CFR 100, Reactor Site Criteria. Additionally, the containment structure provides radiation shielding from the fission products that may be present in the containment atmosphere following accident conditions. The requirements on containment penetration closure provided in Technical Specification (TS) 3.9.3 ensure that a release of fission product radioactivity within containment will be restricted from escaping to the environment.

Each containment is equipped with two personnel air locks. One is located at the 100 ft. level and opens to the outside yard area. The second is at the 140 ft. level and opens into the auxiliary building. The air lock design utilizes two interlocked personnel access doors, which are part of the containment pressure boundary. Each door is made leak tight by means of a seal against two surfaces, with provisions for testing seal integrity. Each door has been provided with dual seals; thus, pressurizing between the two seals can test each individual door seal.

Other containment penetrations are provided for system connections between the containment and those portions of the systems outside containment. During the performance of Local Leak Rate Testing (LLRT), certain containment isolation valves (i.e., those subject to 10 CFR 50, Appendix J, Type C testing) are required to be opened in order to drain the penetration piping, providing direct access from the containment atmosphere to the outside atmosphere. The requirements of containment penetration closure ensure that a release of fission product radioactivity within containment will be restricted from escaping to the environment.

4.0 TECHNICAL ANALYSIS

This section discusses the impact of the personnel air locks and containment penetrations remaining open during CORE ALTERATIONS and movement of irradiated fuel inside containment on a fuel handling accident, on a loss of shutdown cooling event, and severe weather protection.

FUEL HANDLING ACCIDENT INSIDE CONTAINMENT

During CORE ALTERATIONS or movement of irradiated fuel assemblies within containment, the most severe radiological consequences result from a fuel handling accident (FHA). The FHA is a postulated event that involves damage to the most limiting irradiated fuel assembly. FHA, analyzed in Palo Verde Nuclear Generating Station's (PVNGS) *Updated Final Safety Analysis Report* (UFSAR) results from the dropping of a single fuel assembly during fuel handling. The requirements of Technical Specification (TS) Limiting Condition for Operation (LCO) 3.9.6 "Refueling Water Level-Fuel Assemblies," TS LCO 3.9.7 "Refueling Water Level-CEAs," and Technical Requirements Manual TLCO 3.9.100 "Decay Time," ensures 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 "Reactor Site Criteria." The proposed amendment requests do not change the requirements of TS LCOs 3.9.6, 3.9.7 or TLCO 3.9.100.

During refueling activities within containment, TS LCOs 3.9.6 and 3.9.7 require a minimum water level of 23 ft above the top of the reactor vessel flange when either the fuel assemblies being moved or the fuel assemblies seated within the reactor vessel are irradiated. Meeting this requirement maintains sufficient water level in the refueling canal, the fuel transfer canal, the refueling cavity, and the spent fuel pool necessary to retain iodine fission product activity in the water in the event of a fuel handling accident. Sufficient iodine activity would be retained in the water to limit offsite doses from the accident to well within the guideline values of 10 CFR 100. This is consistent with the guidance in NUREG-0800 *Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants* Section 15.7.4 "Radiological Consequences of Fuel Handling Accidents."

The evaluation for the offsite and control room radiological consequences of a FHA in the containment with open air locks, penetrations and hatches and no isolation was performed using the Bechtel computer code LOCADOSE. The methodology used for the software is described in detail in the Palo Verde UFSAR Revision 11, Appendix 15B "Dose Models Used to Evaluate the Environmental Consequences of Accidents." The modeling for calculating the radiological consequences of a FHA is based on the conservative assumptions in Regulatory Guide (RG) 1.25 *Assumptions Used for Evaluating the Potential Radiological Consequences of a Fuel Handling Accident in the Fuel Handling and Storage Facility for Boiling and Pressurized Water Reactors,* March 23, 1972. Short-term atmospheric dispersion factors used in this analysis are described PVNGS UFSAR Section 2.3.4 "Short-term (Accident) Diffusion Estimates," and Appendix 15B for offsite locations and the control room, respectively. This analysis assumed all fuel rods (236) within a dropped assembly would fail as required by RG 1.25.

The gap activity in the damaged rods is released and consists of 10% of the total noble gases other than Kr-85, 30% of the Kr-85, and 10% of the total radioactive iodine in the rods at the time of the accident. The assumptions used in generating the fuel rod gap inventories are consistent with RG 1.25 with the exception that the release fraction for Iodine-131 and all Noble gases except Kr-85 are increased from 10% to 15% to account for higher fuel burn-ups. This gap inventory described in this FHA analysis is the same as current PVNGS UFSAR analysis. The source terms for all isotopes are calculated using TID 14844 *Calculation of Distance Factors for Power and Test Reactor Sites* with exception of long lived isotopes such as Kr-85. Computer code ORIGEN is used to calculate the inventory of long-lived isotopes. This inventory is conservatively based on an anticipated power up-rate condition of 103% plus an additional 2% power uncertainty for a core power of 4070 Mwth. PVNGS UFSAR Table 15.7.4-1 "Parameters Used in Evaluating the Radiological Consequences of a Fuel Handling Accident" provides a complete list of assumptions and parameters used for FHA analysis. Control room parameters used for evaluation of control room habitability are provided in UFSAR Appendix 15B and Section 6.4 "Habitability Systems."

The radioactive material that escapes from the pool to the building is released from the building over a two-hour time period. This analysis assumes that the noble gases and radioiodine from the gap of the broken fuel rods are instantaneously released to the refueling pool water and then it is released to the containment environment. The entire airborne radioactivity reaching the containment is released to the outside environment over a two-hour period. This assumption is overly conservative, since for all practical purposes, it ignores the closing of any containment penetrations which would stop any release through that penetration.

As required by NUREG-0800, Section 15.7.4, the radiological consequences of a FHA must be within the acceptance limits of 75 rem for the thyroid and 6 rem for the whole body. General Design Criterion (GDC) 19 "Control Room," constrains

control room exposure under accident conditions to 5 rem whole body or its equivalent to any part of the body for the duration of the accident. The table below provides a tabulation of offsite and control room dose consequences in Rem.

Consequences of Fuel Handling Accident with an Open Containment

Dose (rem)	Thyroid		Whole Body		Beta skin	
	Analysis	SRP	Analysis	SRP	Analysis	SRP
2 hr Exclusion Area Boundary	74.7	75	0.39	6	--	--
30 day Low Population Zone Boundary	20.8	75	0.11	6	--	--
30 day Control Room	11.5	30	0.13	5	3.1	30

The above analysis results demonstrate that the offsite and control room doses due to an FHA in the containment building with an open containment are within the acceptance criteria given in SRP Section 15.7.4 and GDC 19.

A change to the bases of TS 3.9.3 is also being made that will require administrative controls similar to those of TS 3.6.3 be in place when opening a containment penetration during refueling activities as defined in TS 3.9.3. These procedural controls will include appropriate personnel maintaining an awareness of the open status of the penetration flow paths and specified individuals designated and readily available to promptly isolate open penetrations flow paths in the event of a FHA inside containment.

As a result, this proposed amendment does not change, degrade, or prevent actions described or assumed in any accident. It will not alter any assumptions previously made in evaluating radiological consequences or affect any fission product barriers. It does not increase any challenges to safety systems. Therefore, this proposed amendment would not increase or have any impact on the consequences of events described and evaluated in the PVNGS UFSAR Chapter 6 "Engineered Safety Features," or Chapter 15 "Accident Analysis."

LOSS OF SHUTDOWN COOLING DURING CORE ALTERATIONS/MOVEMENT OF IRRADIATED FUEL IN CONTAINMENT

The changes proposed by this amendment request would allow refueling activities to continue within containment with the personnel air locks and other containment penetrations open. TS 3.9.4 "Shutdown Cooling (SDC) and Coolant Circulation – High Water Level" requires one SDC loop to be OPERABLE and in operation when

in MODE 6 with the water level equal to or greater than 23 feet above the top of the reactor vessel flange. If this can not be met, suspension of loading irradiated fuel assemblies is required immediately and closure of all containment penetrations providing direct access from containment atmosphere to the outside atmosphere is required in four hours. The proposed amendment request does not change the requirements of TS 3.9.4.

The PVNGS' core data books contain the safety analysis operational data on time to boil following a loss of SDC. This time was developed using the guidance in Branch Technical Position 9-2 "Residual Decay Energy for Light-Water Reactors for Long-Term Cooling." The time to boil at 100 hours minimum decay time is greater than 4.5 hours. Based on this, the time to boil is greater than the 4-hour completion time required for the closure of the containment penetrations identified in LCO 3.9.4 ACTION A.

As a result, no additional controls are considered necessary to implement the proposed amendment request.

SEVERE WEATHER PROTECTIOIN

PVNGS has two personnel air locks. One is accessed from the 140' level of the auxiliary building with no direct access to the outside yard areas. The second is at the 100' level with direct access to the outside yard area. The generation of missiles from natural phenomena and events near the site are discussed in UFSAR Sections 3.5.1.4 and 3.5.1.5. PVNGS UFSAR Section 3.5.1.4 "Missiles Generated by Natural Phenomena (Tornado)" states that tornado-generated missiles were considered in design of structures that are required for safe shutdown. The missiles considered in design and their characteristics are listed in UFSAR Table 3.5-8. Missiles generated by any other natural phenomena were not considered credible. Additionally, UFSAR Section 3.5.1.5 "Missiles Generated by Events near the Site" states that considering the distances from potential accident sites to the plant, missiles pose no credible hazard.

As stated in Palo Verde's response to Generic Letter 88-20, Supplement 4 "Individual Plant Examination of External Events (IPEEE) for Severe Accident Vulnerabilities," the design basis tornado for PVNGS facility is 300 miles per hour and the design basis high wind speed is 105 miles per hour. The IPEEE identified that all safety-related components except the essential spray ponds are located inside the power block house designed against tornado wind loads and tornado missile loads. The evaluation performed was found to be consistent with the guidance provided in Section 5.2 of NUREG-1407.

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. This procedure is entered when any of the following occur. The national weather

service has issued a high wind, severe weather, severe thunderstorm, or tornado warning for western Maricopa County. The national weather service has issued a tornado watch for western Maricopa County. The meteorological tower is indicating sustained or gusting winds of 50 mph or more. This procedure contains actions to ensure the personnel air lock is closed and that all fuel-handling operations are suspended. The proposed amendment will not change the severe weather entry requirements of procedure 40AO-9ZZ21.

As a result, no additional controls are considered necessary to implement the proposed amendment request.

5.0 REGULATORY SAFETY ANALYSIS

5.1 No Significant Hazards Consideration

Arizona Public Service has evaluated whether or not a significant hazards consideration is involved with the proposed amendment(s) by focusing on the three standards set forth in 10 CFR 50.92, "Issuance of Amendment," as discussed below:

1. Does the proposed change involve a significant increase in the probability or consequences of an accident previously evaluated?

   No. The proposed change does not involve a significant increase in the probability or consequences of an accident previously evaluated.

   The proposed amendment to Technical Specification (TS) 3.9.3 "Containment Penetrations," would allow the personnel air locks and other containment penetrations to remain open during CORE ALTERATIONS or movement of irradiated fuel assemblies within containment. The position of the personnel air locks and other containment penetrations (open or closed) are not an initiator of any accident.

   The fuel handing accident contained in the *Updated Final Safety Analysis Report*, Revision 11 assumes that the personnel air locks, containment penetrations, and the equipment hatch are open and the entire airborne radioactivity reaching the containment is released to the outside environment. Using these assumptions, the current analysis results in off site doses that are well within guideline values specified in 10 CFR 100 "reactor Site Criteria" and calculated control room doses within the acceptance criteria specified in General Design Criteria 19 "Control Room."

   Therefore, the proposed amendment request to allow the personnel air locks and containment penetrations to be open during CORE ALTERATIONS and movement of irradiated fuel assemblies in

containment does not involve a significant increase in the probability or consequences of an accident previously evaluated.

2. Does the proposed change create the possibility of a new or different kind of accident from any accident previously evaluated?

   No. The proposed amendment does not create the possibility of a new or different kind of accident from any accident previously evaluated.

   The proposed amendment to TS 3.9.3 "Containment Penetrations," allowing the personnel air locks and other containment penetrations to be open during CORE ALTERATIONS and movement of irradiated fuel in containment does not involve a physical alteration of the plant (no new or different type of equipment will be installed). It does however, involve a minor change in the methods governing normal plant operation during refueling. This minor change in personnel air lock and containment penetration control does not create the possibility of a new or different kind of accident. The fuel handing accident analysis contained in the *Updated Final Safety Analysis Report*, Revision 11 already assumes that the personnel air locks, containment penetrations, and the equipment hatch are open and the entire airborne radioactivity released in containment following a FHA is transported to the outside environment. This analysis results in off site doses that are well within guideline values specified in 10 CFR 100 "Reactor Site Criteria" and calculated control room doses within the acceptance criteria specified in General Design Criteria 19 "Control Room."

   Thus, the proposed amendment request does not create the possibility of a new or different kind of accident from any accident previously evaluated.

3. Does the proposed change involve a significant reduction in a margin of safety?

   No. The proposed amendment does not involve a significant reduction in a margin of safety.

   The proposed amendment to TS 3.9.3 "Containment Penetrations," allowing the personnel air locks and other containment penetrations to be open during CORE ALTERATIONS and movement of irradiated fuel in containment remains bounded by previously determined radiological dose consequences for a FHA inside containment. The previously analyzed dose consequences assumes that the personnel air locks, containment penetrations, and the equipment hatch are open and the entire airborne radioactivity released in containment is transported to the outside environment. The results of this analysis were determined to be within the limits of 10 CFR 100 "Reactor Site Criteria," and the meets the acceptance

criteria of NUREG-0800 *Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants* Section 15.7.4 "Radiological Consequences of Fuel Handling Accidents." The calculated control room doses are within the acceptance criteria specified in General Design Criteria 19 "Control Room." There are no changes in the assumptions made about the positions of the containment openings and penetrations. Therefore, there is no change in the analysis results and the proposed amendment request does not involve a significant reduction in a margin of safety.

Based on the above, APS concludes that the activities associated with the proposed amendment(s) present no significant hazards consideration under the standards set forth in 10 CFR 50.92 "Issuance of Amendment," (c) and, accordingly, a finding of "no significant hazards consideration" is justified.

5.2 Applicable Regulatory Requirements/Criteria

The proposed Technical Specification amendment to allow the personnel air locks and other containment penetrations to remain open during CORE ALTERATIONS and movement of irradiated fuel in containment potentially affects the dose consequences identified in General Design Criteria 19 "Control Room" and the dose guideline values specified in 10 CFR 100 "Reactor Site Criteria."

However, the fuel handing accident (FHA) contained in the PVNGS *Updated Final Safety Analysis Report* (UFSAR), Revision 11, assumes that the entire airborne radioactivity released in the containment is transported to the outside environment. No changes to these assumptions are required to implement the requested change. As a result, the analysis in UFSAR Section 15.7.4.1 "Fuel Handling Accident Outside of Containment" bounds the condition of the proposed amendment request in which the personnel air locks and other containment penetrations would be open during the accident. The analysis shown in the UFSAR produced the following results: maximum offsite dose of 74.7 rem to the thyroid and 0.39 rem to the whole body, and a control room dose of 11.5 rem thyroid and 0.13 whole body. These analysis results demonstrate that the offsite and control room dose, due to a FHA in the Containment Building with personnel air locks and other containment penetrations open, are well within the acceptance criteria given in 10 CFR 100 "Reactor Site Criteria." The results also meet the acceptance criteria of NUREG-0800 *Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants* Section 15.7.4 "Radiological Consequences of Fuel Handling Accidents." and GDC 19.

In conclusion there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner. There is

also reasonable assurance that such activities will be conducted in compliance with the Commission's regulations, and that the issuance of the proposed amendment will not be inimical to the common defense and security or to the health and safety of the public.

6.0 ENVIRONMENTAL CONSIDERATION

APS has determined that the proposed amendment involves no changes in the amount or type of effluent that may be released offsite, and results in no increase in individual or cumulative occupational radiation exposure. As described above, the proposed TS amendment involves no significant hazards consideration and, as such, meets the eligibility criteria for categorical exclusion set forth in Section (c)(9) of 10 CFR 51.22 "Criterion for Categorical Exclusion."

7.0 REFERENCES

1.1 10 CFR 100 "Reactor Site Criteria"

1.2 Palo Verde Nuclear Generating Station *Updated Final Safety Analysis Report, Revision 11*

1.3 NUREG-0800 *Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants*

1.4 Regulatory Guide 1.25 *Assumptions Used for Evaluating the Potential Radiological Consequences of a Fuel Handling Accident in the Fuel Handling and Storage Facility for Boiling and Pressurized Water Reactors*

Similar amendment requests have been approved for the following facilities:

Facility	Amendment #(s)	Approval Date	Accession #
(1) Calloway	138	09/26/2000	003754622
(2) Calvert Cliffs 1/2	242/216	03/12/2001	010180575
(1)(2) Shearon Harris 1	104	07/30/2001	012110325
(1) ANO 2	230	04/18/2001	011090316
(1) Wolf Creek	135	09/12/2000	003750021

(1) Containment Penetrations
(2) Personnel Air Locks

Marked-up Technical Specifications Pages

Units 1, 2, and 3: Pages 3.9.3-1 and 3.9.3-2

3.9 REFUELING OPERATIONS

3.9.3 Containment Penetrations

LCO 3.9.3 The containment penetrations shall be in the following status:

a. The equipment hatch closed and held in place by four bolts;

b. One door in each air lock is capable of being closed; and

c. Each penetration providing direct access from the containment atmosphere to the outside atmosphere either:

1. closed by a manual or automatic isolation valve, blind flange, or equivalent, or

2. capable of being closed by an OPERABLE Containment Purge and Exhaust Isolation System.

---------- NOTE ----------

Penetration flow path(s) providing direct access from the containment atmosphere to the outside atmosphere may be unisolated under administrative controls.

APPLICABILITY: During CORE ALTERATIONS,
During movement of irradiated fuel assemblies within containment.

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. One or more containment penetrations not in required status.	A.1	Suspend CORE ALTERATIONS.	Immediately
	AND		
	A.2	Suspend movement of irradiated fuel assemblies within containment.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.9.3.1	Verify each required containment penetration is in the required status.	7 days
SR 3.9.3.2	Verify each required containment purge and exhaust valve actuates to the isolation position on an actual or simulated actuation signal.	18 months

Attachment 2

Retyped Technical Specifications Pages

Units 1, 2, and 3: Pages 3.9.3-2 and 3.9.3-2

3.9 REFUELING OPERATIONS

3.9.3 Containment Penetrations

LCO 3.9.3 The containment penetrations shall be in the following status:

a. The equipment hatch closed and held in place by four bolts;

b. One door in each air lock is capable of being closed; and

c. Each penetration providing direct access from the containment atmosphere to the outside atmosphere either:

1. closed by a manual or automatic isolation valve, blind flange, or equivalent, or

2. capable of being closed by an OPERABLE Containment Purge and Exhaust Isolation System.

---NOTE---
Penetration flow path(s) providing direct access from the containment atmosphere to the outside atmosphere may be unisolated under administrative controls.

APPLICABILITY: During CORE ALTERATIONS,
During movement of irradiated fuel assemblies within containment.

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. One or more containment penetrations not in required status.	A.1	Suspend CORE ALTERATIONS.	Immediately
	AND		
	A.2	Suspend movement of irradiated fuel assemblies within containment.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.9.3.1	Verify each required containment penetration is in the required status.	7 days
SR 3.9.3.2	Verify each required containment purge and exhaust valve actuates to the isolation position on an actual or simulated actuation signal.	18 months

Attachment 3

Associated Changes To the PVNGS Technical Specification Bases

(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 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

(continued)

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 capable of being closed.

The requirements on containment penetration closure ensure that a release of fission product radioactivity within containment will be restricted to within regulatory limits. ~~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.

(continued)

BASES

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 containment personnel airlocks. 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.

(continued)

BASES

The containment personnel airlock doors may be open during movement of irradiated fuel in the containment and during CORE ALTERATIONS provided that one door is capable of being closed in the event of a fuel handling accident. Should a fuel handling accident occur inside containment, one personnel airlock door will be closed following an evacuation of containment.

The LCO is modified by a Note allowing penetration flow paths with direct access from the containment atmosphere to the outside atmosphere to be unisolated under administrative controls. Administrative controls ensure that 1) appropriate personnel are aware of the open status of the penetration flow path during CORE ALTERATIONS or movement of irradiated fuel assemblies within containment, and 2) specified individuals are designated and readily available to isolate the flow path in the event of a fuel handling accident.

(continued)

BASES

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 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.

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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 in excess of those recommended by Standard Review Plan Section 15.7.4 (Reference 3).

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.

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.

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Retyped Technical Specifications Pages Combined LCOs 3.9.3 a., b., and c.

Units 1, 2, and 3: Pages 3.9.3-2 and 3.9.3-2

3.9 REFUELING OPERATIONS

3.9.3 Containment Penetrations

LCO 3.9.3 The containment penetrations shall be in the following status:

a. The equipment hatch closed and held in place by four bolts, or if open, capable of being closed;

b. One door in each air lock is capable of being closed; and

c. Each penetration providing direct access from the containment atmosphere to the outside atmosphere either:

1. closed by a manual or automatic isolation valve, blind flange, or equivalent, or

2. capable of being closed by an OPERABLE Containment Purge and Exhaust Isolation System.

---NOTE---
Penetration flow path(s) providing direct access from the containment atmosphere to the outside atmosphere may be unisolated under administrative controls.

APPLICABILITY: During CORE ALTERATIONS,
During movement of irradiated fuel assemblies within containment.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more containment penetrations not in required status.	A.1 Suspend CORE ALTERATIONS. AND	Immediately
	A.2 Suspend movement of irradiated fuel assemblies within containment.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.9.3.1	Verify each required containment penetration is in the required status.	7 days
SR 3.9.3.2	Verify each required containment purge and exhaust valve actuates to the isolation position on an actual or simulated actuation signal.	18 months
SR 3.9.3.3	Verify the capability to close the equipment hatch, if open	7 days