APS

Palo Verde Nuclear
Generating Station

David Mauldin
Vice President
Nuclear Engineering
and Support

TEL (623) 393-5553
FAX (623) 393-6077

Mail Station 7605
P.O. Box 52034
Phoenix, AZ 85072-2034

10 CFR 50.90
10 CFR 50.91

102-04630-CDM/SAB/TNW/RJR
December 13, 2001

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)**
Units 1, 2, and 3
Docket Nos. STN 50-528, 50-529, 50-530
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 amendment to Technical Specification 3.9.3, Containment Penetrations, for Palo Verde Nuclear Generating Station (PVNGS) Units 1, 2, and 3. The proposed amendment discussed in Enclosure 2 would allow the containment equipment hatch to remain open, but capable of being closed and held in place by four bolts, during CORE ALTERATIONS or movement of irradiated fuel assemblies within containment.

This amendment request is similar to the Wolf Creek Nuclear Operating Corporation submittal of August 7, 2001. APS is submitting this license amendment request in collaboration with an industry consortium of five plants known as Strategic Teaming and Resource Sharing (STARS). The STARS group consists of Wolf Creek Nuclear Operating Corporation, TXU Electric, AmerenUE, Pacific Gas and Electric, and STP Nuclear Operating Company. APS requests approval of the proposed amendment by March 1, 2002 in order to be implemented prior to PVNGS Unit 2 refueling outage 10. Once approved, the amendment shall be implemented within 45 days. Technical specification bases and procedure changes required to support this amendment request will be completed prior to implementation.

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

No commitments are being made to the NRC by this letter.

A001

In accordance with the PVNGS Quality Assurance Program, the Plant Review Board and Offsite Safety Review Committee have reviewed and concurred with this proposed amendment. 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).

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

Sincerely,

David Mauldin

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)
	L. R. Wharton	(NRR Project Manager)	
	J. H. Moorman	(NRC Resident Inspector)	
	A. V. Godwin	(ARRA)	

AFFIDAVIT

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.

C. D. Mauldin

C. D. Mauldin

Sworn To Before Me This 13th Day Of December, 2001.

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

Evaluation of Proposed Amendment Request

Technical Specification 3.9.3, Containment Penetrations
Equipment Hatch

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 proposed Technical Specification amendment would allow the containment equipment hatch to remain open, but capable of being closed and held in place by four bolts, during CORE ALTERATIONS and movement of irradiated fuel in containment. This amendment would allow refueling activities to continue while the equipment hatch is open and available for unrestricted access of personnel and large equipment. The typical time frame to close the open equipment hatch is less than one hour. A new Surveillance Requirement will be added to verify the capability to close the equipment hatch, if open, and CORE ALTERATIONS or movement of irradiated fuel assemblies are in progress within containment, at a frequency of seven days.

The proposed amendment request is similar to the license amendments issued to Arkansas Nuclear One, Units 1 and 2 on April 16, 1999 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 March 1, 2002 in order to be implemented prior to the PVNGS Unit 2 refueling outage 10.

2.0 PROPOSED CHANGE

Currently, Palo Verde Nuclear Generating Station's (PVNGS) Technical Specification (TS) 3.9.3 "Containment Penetrations Limiting Condition for Operation" requires that the equipment hatch be closed and held in place by four bolts during CORE ALTERATIONS or during movement of irradiated fuel assemblies within containment. The proposed amendment to TS would allow the containment equipment hatch to remain open, but capable of being closed and held in place by four bolts, during CORE ALTERATIONS and movement of irradiated fuel in containment. The typical time frame to close the open equipment hatch is less than one hour. A new Surveillance Requirement will be added to verify the capability to close the equipment hatch, if open, and CORE ALTERATIONS or movement of irradiated fuel assemblies are in progress within containment, at a frequency of seven days.

By changing this requirement to allow the equipment hatch to remain open during CORE ALTERATIONS and movement of irradiated fuel in containment, PVNGS expects to optimize outages by reducing outage time and cost. An example of the impact that having the equipment hatch available for transporting large equipment occurred during Unit 1's ninth refueling outage when repairs to the pedestal crane, which was being used to support control element assembly cutup, were delayed until core off load was completed and the equipment hatch could be reopened. This delay caused a two-day extension to the outage. PVNGS will be replacing steam generators in Unit 2 and the use of the equipment hatch will facilitate the

movement of equipment and personnel into and out of containment reducing wear on the personnel air locks and reducing critical path time to stage equipment in containment.

In summary, this proposed amendment would allow the containment equipment hatch to remain open, but capable of being closed, during CORE ALTERATIONS and movement of irradiated fuel in containment. A new Surveillance Requirement would also be added to verify the capability to close the equipment hatch, if open and CORE ALTERATIONS or movement of irradiated fuel assemblies are in progress within containment, at a frequency of seven days.

3.0 BACKGROUND

The containment functions to contain fission product radioactivity that may be released from a reactor fuel assembly following an 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 23-ft diameter 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. Access to the equipment hatch is gained by moving a pair of missile shield doors to expose the hatch cover. The hatch cover itself is held closed by 32 swing bolts. Once loosened and moved out of the way (the bolts remain in-place to facilitate closure) the hatch cover is then lifted up into its storage position. The hatch cover is raised and lowered using two dedicated electric hoists.

4.0 TECHNICAL ANALYSIS

This section discusses the impact of the equipment hatch 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 on 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. FHAs, analyzed in the Palo Verde Nuclear Generating Station's (PVNGS) *Updated Final Safety Analysis Report* (UFSAR), include dropping a single irradiated fuel assembly and handling tool onto other irradiated fuel assemblies. 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," ensure that the release of fission product radioactivity, subsequent to a fuel handling accident, results in doses that are well within the values specified in 10 CFR 100 "Reactor Site Criteria." The proposed amendment request does 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 less than one third of 10 CFR 100 limits. This is consistent with the intent of 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 penetrations, 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 in 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 that used in the 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 the exception of long lived isotopes such as Kr-85. The 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 the equipment hatch which would stop any release through the hatch opening.

NUREG-0800, Section 15.7.4, provides guidance that 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**	--	--
2 hr 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 a FHA in the Containment Building with equipment hatch open 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. It will require that any obstruction(s) (e.g., cables, hoses, or temporary railings that could impede equipment hatch closure) shall be capable of being quickly removed so the hatch is capable of being closed with a minimum of four bolts should a FHA occur 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 equipment hatch 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 moving 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 PROTECTION

The changes proposed by this amendment request would allow refueling activities to continue within containment with the equipment hatch open. 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 the 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. However, this analysis was performed with the equipment hatch closed and missile shields in-place.

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 1) the national weather service has issued a high wind, severe weather, severe thunderstorm, or tornado warning for western Maricopa County; 2) the national weather service has issued a tornado watch for western Maricopa County, or 3) the meteorological tower is indicating sustained or gusting winds of 50 mph or more. The procedure contains actions to ensure the containment hatch 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 equipment hatch to remain open, but capable of being closed, during CORE ALTERATIONS or movement of irradiated fuel assemblies within containment. The position of the equipment hatch (open or closed) is not an initiator of any accident.

   The fuel handing accident (FHA) contained in the *Updated Final Safety Analysis Report*, Revision 11, currently assumes that the entire airborne radioactivity reaching the containment is released to the outside environment. This results in a maximum offsite dose of 74.7 rem to the

thyroid and 0.39 rem to the whole body. The calculated control room dose of 11.5 rem thyroid and 0.13 whole body are within the acceptance criteria specified in General Design Criteria 19 "Control Room."

Therefore, the proposed amendment request 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 equipment hatch to be open and capable of being closed does not involve a physical alteration of the plant (no new or different type of equipment will be installed) or a change in the methods governing normal plant operation. 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 equipment hatch to be open and capable of being closed remains bounded by previously determined radiological dose consequences for a FHA inside containment. The previously analyzed dose consequences were determined to be within the limits of 10 CFR 100 "Reactor Site Criteria," and they 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." Therefore, the proposed amendment request does not involve a significant reduction in a margin of safety. Additionally, a new surveillance will be added to verify the capability to close the equipment hatch, if open and CORE ALTERATIONS or movement of irradiated fuel assemblies are in progress within containment, at a frequency of seven days.

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(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 containment equipment hatch to remain open, but capable of being closed and held in place by four bolts, during CORE ALTERATIONS and movement of irradiated fuel in containment directly affects dose consequences identified in General Design Criteria 19 "Control Room" and the dose values specified in 10 CFR 100 "Reactor Site Criteria."

The fuel handing accident (FHA) contained in the PVNGS *Updated Final Safety Analysis Report* (UFSAR), Revision 11, assumes that the entire airborne radioactivity reaching the containment is released to the outside environment. 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 equipment hatch 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 rem to the whole body. These analysis results demonstrate that the offsite and control room dose, due to a FHA in the Containment Building with the equipment hatch open, are well within the acceptance criteria given in 10 CFR 100 "Reactor Site Criteria," and 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, based on the considerations discussed above, (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) 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

7.1 10 CFR 100 "Reactor Site Criteria"
7.2 Palo Verde Nuclear Generating Station *Updated Final Safety Analysis Report, Revision 11*

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

7.4 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 #
Shearon Harris 1	104	07/30/2001	ML012110325
Calvert Cliffs 1 & 2	242/216	03/12/2001	ML010180575
Waterford 3	169	10/02/2000	ML003758489
Vogtle 1 & 2	115/93	09/11/2000	ML003749439
ANO 1 & 2	195/203	04/16/1999	ML9904220057

Attachment 1

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, or if open, capable of being closed.

b. One door in each air lock 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.

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
SR 3.9.3.3	Verify the capability to close the equipment hatch, if open.	7 days

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, or if open, capable of being closed;

b. One door in each air lock 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.

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
SR 3.9.3.3	Verify the capability to close the equipment hatch, if open	7 days

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 capable of being closed and 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)

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.

(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 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. Any

(continued)

BASES

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 closed with a minimum of four bolts should a fuel handling accident occur inside containment.

(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.

BASES

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 demonstrates that the necessary hardware, tools, equipment and personnel are available to close the equipment hatch. 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 closed. 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.

BASES

2. UFSAR, Section 15.7.4.

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