A subsidiary of Pinnacle West Capital Corporation

Palo Verde Nuclear
Generating Station

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102-06114-JHH/GAM
December 23, 2009

ATTN: Document Control Desk
U.S. Nuclear Regulatory Commission
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 and 50-530
Response to November 12, 2009, Request for Additional Information Regarding Fire Protection for the Review of the PVNGS License Renewal Application (LRA), and License Renewal Application Amendment No. 6

By letter dated November 12, 2009, the NRC issued a request for additional Information (RAI) related to the PVNGS LRA. Enclosure 1 contains APS's response to the November 12, 2009, RAI. Enclosure 2 contains PVNGS LRA updates to reflect changes made as a result of the RAI responses.

APS makes no commitments in this letter. Should you need further information regarding this submittal, please contact Russell A. Stroud, Licensing Section Leader, at (623) 393-5111.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on 12-23-2009
(date)

Sincerely,

JHH/RAS/GAM/gat

A138
NRR

Enclosures:

1. Response to November 12, 2009, Request for Additional Information Regarding Fire Protection for the Review of the PVNGS License Renewal Application

2. Palo Verde Nuclear Generating Station License Renewal Application Amendment No. 6

cc:

E. E. Collins Jr.	NRC Region IV Regional Administrator
J. R. Hall	NRC NRR Project Manager
R. I. Treadway	NRC Senior Resident Inspector for PVNGS
L. M. Regner	NRC License Renewal Project Manager

ENCLOSURE 1

Response to November 12, 2009, Request for Additional Information Regarding Fire Protection for the Review of the PVNGS License Renewal Application

NRC RAI 2.3.3.19-1

License renewal application (LRA) drawing LR-PVNGS-FP-01-M-FPP-002 shows transformers in proximity to the turbine building as out of scope (i.e., not colored in green). The staff requests that the applicant verify whether these components are in the scope of license renewal in accordance with Title 10 of the *Code of Federal Regulations* (10 CFR) Part 54.4(a) and subject to an aging management review (AMR) in accordance with 10 CFR 54.21(a)(1). If they are excluded from the scope of license renewal and not subject to an AMR, the staff requests that the applicant provide justification for the exclusion.

APS Response to RAI 2.3.3.19-1

Transformers shown on drawing LR-PVNGS-FP-01-M-FPP-002 at coordinates B-2 through B-7 are electrical components within the scope of license renewal. These transformers are excluded from aging management review in accordance with 10 CFR 54.21(a)(1). NEI 95-10 Appendix B item 104 identifies that transformers are excluded from aging management review under 10 CFR 54.21(a)(1).

These structures, systems, and components (SSCs) were not highlighted on drawing LR-PVNGS-FP-01-M-FPP-002 because those drawings are mechanical boundary drawings and only mechanical components within scope of license renewal are highlighted on mechanical boundary drawings. The scoping and screening methodology for mechanical systems is further detailed in the PVNGS LRA Section 2.1.3.1, and the scoping and screening methodology for electrical systems is further detailed in PVNGS LRA Section 2.1.3.3. A single license renewal drawing, LR-PVNGS-ELEC-E-MAA-001, was created for electrical based on the switchyard one-line diagram.

NRC RAI 2.3.3.19-2

The following LRA drawings show fire protection system components as out of scope (i.e., not colored in green):

- LRA drawing LR-PVNGS-FP-01-M-FPP-003 shows fire water system valves and drains in the Upper and Lower Cable Spreading Room and Radwaste Building as out of scope.

- LRA drawing LR-PVNGS-FP-01-M-FPP-006 shows fire water system valves and drains as out of scope.

- LRA drawing LR-PVNGS-FP-01-M-FPP-001 shows fire water system valves, drains, and fuel tank dikes as out of scope.

The staff requests that the applicant verify whether these fire protection system components are in the scope of license renewal in accordance with 10 CFR 54.4(a) and subject to an AMR in accordance with 10 CFR 54.21(a)(1). If they are excluded from the scope of license renewal and not subject to an AMR, the staff requests that the applicant provide justification for the exclusion.

APS Response to RAI 2.3.3.19-2

Ongoing reviews of system branch lines also identified components noted below as within the scope of license renewal and updated system boundary drawings as indicated.

LRA drawing LR-PVNGS-FP-01-M-FPP-003:

LRA drawing LR-PVNGS-FP-01-M-FPP-003 has been revised to reflect that the fire water system valves and drains in the Upper and Lower Cable Spreading Room and Radwaste Building are within the scope of license renewal. The additional components have been highlighted in green on Revision 1 of LRA drawing LR-PVNGS-FP-01-M-FPP-003.

LRA drawing LR-PVNGS-FP-01-M-FPP-006:

LRA drawing LR-PVNGS-FP-01-M-FPP-006 has been revised to reflect that the fire water system valves and drains are within the scope of license renewal, with exception of the valves noted below. The additional components are highlighted in green on Revision 1 of LRA drawing LR-PVNGS-FP-01-M-FPP-006.

The following valves shown on LRA drawing LR-PVNGS-FP-01-M-FPP-006 are not within the scope of license renewal because they are not part of the criteria (a)(3) pressure boundary and do not have a criterion (a)(2) function. Criterion (a)(2) components are non-safety related and are in rooms where there is potential for spatial interaction with safety-related equipment. These valves are not located in rooms with the potential for spatial interaction.

Fire water system valves not within the scope of license renewal:

- V407 & V408, Preaction Valve V711 vent & drain
- V419 & V420, Preaction Valve V729 vent & drain
- V421 & V422, Preaction Valve V726 vent & drain
- V423 & V424, Preaction Valve V723 vent & drain
- V425 & V426, Preaction Valve V732 vent & drain

LRA drawing LR-PVNGS-FP-AO-M-FPP-001:
(referred to in RAI 2.3.3.19-2 as LR drawing LR-PVNGS-FP-01-M-FPP-001)

LRA drawing LR-PVNGS-FP-AO-M-FPP-001 has been revised to show fire water system valves and drains within the scope of license renewal, with exception of the items noted below. The additional components are highlighted in green on Revision 1 of LRA drawing LR-PVNGS-FP-AO-M-FPP-001.

Portions of the fire water system shown on drawing LR-PVNGS-FP-AO-M-FPP-001 and listed below do not have a criteria (a)(3) function or a criterion (a)(2) function. Criterion (a)(2) components are non-safety related and are in rooms where there is potential for spatial interaction with safety-related equipment. These valves are not located in rooms with the potential for spatial interaction.

Portions of the Fire Water System not within the scope of license renewal:

- Caustic Injection Pump & associated piping and valves
- Sulfite Injection Pump & associated piping and valves
- Motor Driven Recirculation Pump & associated piping and valves (for chemical addition)
- Fire Water Pump test/recirculation piping and valves
- Water Reclamation fire suppression piping and valves
- Chemical Storage Building fire suppression piping and valves
- Vehicle Maintenance Facility fire suppression piping and valves
- Station Blackout Gas Turbine General Area fire suppression piping and valves
- Low Level Radioactive Waste Material Storage Facility fire suppression piping and valves

The fuel oil tank dikes are in the scope of license renewal and screened in as generic concrete components in LRA section 2.4.13, Yard Structures. The fuel oil tank dikes are not highlighted in green on LRA drawing LR-PVNGS-FP-AO-M-FPP-001 because they are not mechanical components. Only mechanical components within scope of license renewal are highlighted on mechanical boundary drawings. A single license renewal drawing, LR-PVNGS-STR-OOB-001, was created for structures based on the site plan.

As a result of these changes, LRA Tables 2.3.3-19 and 3.3.2-19 have been revised and are included in Enclosure 2 as LRA Amendment 6. A cast iron orifice for the branch line associated with the jockey pump in the Fire Pump House has been added to LRA Tables 2.3.3-19 and 3.3.2-19. The material for the small diameter system air check valves for preaction valves was corrected from cast iron to copper alloy and resulted in an additional line on LRA Table 2.3.3-19 for the interior environment associated with the copper alloy check valves.

NRC RAI 2.3.3.19-3

LRA drawing LR-PVNGS-FP-01-M-FPP-004 shows several components associated with the carbon dioxide (CO2) fire suppression system in the Auxiliary Building as out of scope (i.e., not colored in green). The staff requests that the applicant verify whether these CO2 fire suppression system components are in the scope of license renewal in accordance with 10 CFR 54.4(a) and subject to an AMR in accordance with 10 CFR 54.21(a)(1). If they are excluded from the scope of license renewal and not subject to an AMR, the staff requests that the applicant provide justification for the exclusion.

APS Response to RAI 2.3.3.19-3

LRA drawing LR-PVNGS-FP-01-M-FPP-004 has been revised (Revision 1) to show the following additional components within scope of license renewal (highlighted in green):

- Drain valve V380 at coordinate B-5
- Switchgear Building CO2 hose stations
- Carbon Dioxide Storage Unit components VE052, VW001, V743, UV116 and associated piping

The Electric Vaporizer and CO2 supply line for the Main Generator purge do not have a license renewal intended function and are not within the scope of license renewal.

NRC RAI 2.3.3.19-4

LRA Table 2.3.3-19 excludes several types of fire protection components that appear in NUREG-0857 and its supplements and LRA drawings. These components are listed below:

- Pipe fittings, pipe supports, hangers, and couplings
- Fire hose stations, connections and racks
- Filter housings
- Halon 1301 storage bottles
- Dikes for oil spill confinement
- Floor drains and curbs for fire-fighting water
- Passive components in the diesel fuel fire pump engine

For each, determine whether the component should be included in Tables 2.3.3-19 and 3.3.2-19, and, if not, justify the exclusion.

APS Response to RAI 2.3.3.19-4

Palo Verde evaluated the list of components and determined no changes to the LRA are required as described below.

Pipe fittings and couplings:

Pipe fittings and couplings are evaluated as the component type "piping." This is consistent with the definition of piping, piping components, and piping elements noted in NUREG-1801, Chapter IX.B. The component type of "piping" is identified in LRA Table 2.4-14 as a component within the scope of license renewal and subject to an AMR.

Pipe supports and hangers:

Fire Protection pipe supports and hangers are evaluated as structural component type "Supports Non ASME" and are identified in LRA Table 2.4-14 as components within the scope of license renewal and subject to an AMR.

Fire hose stations, connections and racks:

Fire hose stations, connections and racks are evaluated as component types "piping" and "valve" and are identified in LRA Table 2.3.3-19 as components within the scope of license renewal and subject to an AMR.

Filter housings:

Filter housings are evaluated as part of the component type "Filter" in LRA Table 2.3.3-19 as components within the scope of license renewal and subject to an AMR.

Halon 1301 storage bottles:

The component type of "tank" specified in LRA Table 2.3.3-19 includes Halon 1301 storage bottles within the scope of license renewal and subject to an AMR. This is consistent with the definition of tanks noted in NUREG-1801 Chapter IX.B.

Dikes for oil spill confinement:

The PVNGS UFSAR Response to Question 9A.86(c) documents that in the diesel generator building, the day tank rooms door curbs are sized to a height to contain the full volume of the day tank and its associated piping. These curbs are evaluated as component type "concrete element" and are identified in LRA Table 2.4-3 as components within the scope of license renewal and subject to an AMR for fire protection. There are no oil containment dikes in the outside areas that are within the scope of license renewal and subject to an AMR. The PVNGS UFSAR, Table 9B.3-1,

Section D.1(h), documents that all oil filled transformers are located at least 50 feet from any building containing safety-related systems with the exception of the west engineered safety features (ESF) transformer, which is located approximately 48 feet from the 3-hour-rated auxiliary building exterior wall. Therefore dikes for oil spill confinement are not within the scope of license renewal. The PVNGS UFSAR, Section 3.8.4.1.9 documents that the diesel generator fuel oil storage tanks are located underground with approximately 10 feet of earth cover.

Floor drains and curbs for fire-fighting water:

Floor drains are evaluated as component type "piping" and are identified in LRA Table 2.3.3-30 as components within the scope of license renewal and subject to an AMR. Curbs for containing fire-fighting water are evaluated as component type "concrete element" and are identified for each building in LRA Section 2.4 as components within the scope of license renewal and subject to an AMR.

Passive components in the diesel fuel fire pump engine:

These components do not have unique component identification numbers and are integral to the diesel engine, and are evaluated as part of the engine. The fire pump diesel engine is an active component and is excluded from aging management review in accordance with 10 CFR 54.21(a)(1) as further detailed in NEI 95-10 Appendix B item/line 55, which states that fire pump diesel engines are excluded from aging management review under 10 CFR 54.21(a)(1).

NRC RAI 2.4-1

LRA Section 2.4 excludes several types of fire barrier assemblies and components that appear in NUREG-0857, "Safety Evaluation Report Related to the Operation of Palo Verde Nuclear Generating Station, Units 1, 2, and 3," and its supplements. These fire components are listed below:

- Table 2.4-1, fire barrier concrete block (masonry walls) and fire barrier doors
- Table 2.4-3, fire barrier concrete block (masonry walls) and fire barrier coatings/wraps
- Table 2.4-4, fire barrier concrete elements
- Table 2.4-6, fire barrier concrete block (masonry walls) and fire barrier coatings/wraps
- Table 2.4-7, fire barrier concrete block (masonry walls) and fire barrier coatings/wraps
- Table 2.4-8, fire barrier concrete elements, fire barrier concrete block (masonry walls), fire barrier doors, fire barrier seals, and fire barrier coatings/wraps
- Table 2.4-9, fire barrier concrete block (masonry walls) and fire barrier coatings/wraps

- Table 2.4-13, fire barrier coatings/wraps

The staff requests that the applicant verify whether the above fire barrier assemblies and components are in the scope of license renewal in accordance with 10 CFR 54.4(a) and subject to an AMR in accordance with 10 CFR 54.21(a)(1). If they are excluded from the scope of license renewal and not subject to an AMR, the staff requests that the applicant provide justification for the exclusion.

APS Response to RAI 2.4-1

LRA Table 2.4-1, fire barrier concrete block (masonry walls) and fire barrier doors:

There are no fire barrier concrete block (masonry walls) or fire barrier doors within the scope of license renewal and subject to an AMR in the containment building. The PVNGS UFSAR, Appendix 9B.2, Fire Hazards Analysis, describes the fire protection evaluation for the containment building in UFSAR Section 9B.2.11. This evaluation documents no concrete block (masonry walls) or doors as being credited for performing a fire barrier function in the containment building.

LRA Table 2.4-3, fire barrier concrete block (masonry walls) and fire barrier coatings/wraps:

There are no fire barrier concrete block (masonry walls) or fire barrier coatings or wraps within the scope of license renewal and subject to an AMR in the diesel generator building. The PVNGS UFSAR, Appendix 9B.2, Fire Hazards Analysis, describes the fire protection evaluation for the diesel generator building in UFSAR Sections 9B.2.4 and 9B.2.5. This evaluation documents no concrete block (masonry walls) or coatings or wraps as being credited for performing a fire barrier function in the diesel generator building.

LRA Table 2.4-4, fire barrier concrete elements:

There are no fire barrier concrete elements within the scope of license renewal and subject to an AMR in the turbine building. The PVNGS UFSAR, Appendix 9B.2, Fire Hazards Analysis, describes the fire protection evaluation for the turbine building in UFSAR Section 9B.2.20.1. This evaluation documents no concrete elements as being credited for performing a fire barrier function in the turbine building.

LRA Table 2.4-6, fire barrier concrete block (masonry walls) and fire barrier coatings/wraps:

There are no fire barrier concrete block (masonry walls) or fire barrier coatings or wraps within the scope of license renewal and subject to an AMR in the radwaste building. The PVNGS UFSAR, Appendix 9B.2, Fire Hazards Analysis, describes the fire protection evaluation for the radwaste building in UFSAR Section 9B.2.10. This

evaluation documents no concrete block (masonry walls) or coatings or wraps as being credited for performing a fire barrier function in the radwaste building.

LRA Table 2.4-7, fire barrier concrete block (masonry walls) and fire barrier coatings/wraps:

There are no fire barrier concrete block (masonry walls) within the scope of license renewal and subject to an AMR in the main steam support structure. The PVNGS UFSAR, Appendix 9B.2, Fire Hazards Analysis, describes the fire protection evaluation for the main steam support structure in UFSAR Section 9B.2.12. This evaluation documents no concrete block (masonry walls) as being credited for performing a fire barrier function in the main steam support structure.

Fire barrier coatings/wraps are within the scope of license renewal and subject to an AMR in the main steam support structure. Component type Fire Barrier Coatings/Wraps is being added to LRA Table 2.4-7, Section 3.5.2.1.7, and Table 3.5.2-7, as shown in Enclosure 2 as LRA Amendment 6.

LRA Table 2.4-8, fire barrier concrete elements, fire barrier concrete block (masonry walls), fire barrier doors, fire barrier seals, and fire barrier coatings/wraps:

There are no fire barrier concrete elements, fire barrier concrete block (masonry walls), fire barrier doors, fire barrier seals, or fire barrier coatings or wraps within the scope of license renewal and subject to an AMR in the station blackout generator (SBOG) turbine structures. No concrete elements, concrete block (masonry walls), doors, seals, or coatings or wraps are credited for performing a fire barrier function in the SBOG turbine structures in PVNGS UFSAR, Appendix 9B.2, Fire Hazards Analysis.

LRA Table 2.4-9, fire barrier concrete block (masonry walls) and fire barrier coatings/wraps:

There are no fire barrier concrete block (masonry walls) or fire barrier coatings or wraps within the scope of license renewal and subject to an AMR in the fuel building. The PVNGS UFSAR, Appendix 9B.2, Fire Hazards Analysis, describes the fire protection evaluation for the fuel building in UFSAR Section 9B.2.6. This evaluation documents no concrete block (masonry walls) or coatings or wraps as being credited for performing a fire barrier function in the fuel building.

LRA Table 2.4-13, fire barrier coatings/wraps:

There are no fire barrier coatings or wraps within the scope of license renewal and subject to an AMR in the yard structures. The PVNGS UFSAR, Appendix 9B.2, Fire Hazards Analysis, describes the fire protection evaluation for the yard structures in UFSAR Sections 9B.2.9, 9B.2.18, 9B.2.19, 9B.2.20, and 9B.2.21. This evaluation

documents no coatings or wraps as being credited for performing a fire barrier function in the yard structures.

ENCLOSURE 2

Palo Verde Nuclear Generating Station
License Renewal Application Amendment No. 6

Palo Verde Nuclear Generating Station
License Renewal Application
Amendment No. 6

Source: RAI 2.3.3.19-2 Response

LRA Table 2.3.3-19, Fire Protection System (pages 2.3-58 and 2.3-59), is revised as follows (new text underlined):

Table 2.3.3-19 Fire Protection System

Component Type	Intended Function
Closure Bolting	Leakage Boundary (Spatial) Pressure Boundary
Expansion Joint	Pressure Boundary
Filter	Filter Pressure Boundary
Flame Arrestor	Pressure Boundary
Flexible Hoses	Pressure Boundary
Flow Element	Pressure Boundary
Hydrant	Pressure Boundary
Piping	Leakage Boundary (Spatial) Non-S/R Structural Support Pressure Boundary
Pump	Pressure Boundary
Silencer	Pressure Boundary
Spray Nozzle	Pressure Boundary Spray
Sprinkler Head	Pressure Boundary Spray
Strainer	Filter Pressure Boundary
Tank	Pressure Boundary
Tubing	Leakage Boundary (Spatial) Pressure Boundary
Valve	Leakage Boundary (Spatial) Non-S/R Structural Support Pressure Boundary
Orifice	Pressure Boundary

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Source: RAI 2.3.3.19-2 Response

LRA Table 3.3.2-19, Auxiliary Systems – Summary of Aging Management Evaluation – Fire Protection System (pages 3.3-169 to 3.3-181), is revised to include the following line items (new text underlined):

Table 3.3.2-19 Auxiliary Systems – Summary of Aging Management Evaluation – Fire Protection System

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Orifice	PB	Cast Iron	Raw Water (Int)	Loss of material	Fire Water System (B2.1.13)	VII.G-24	3.3.1.68	B
Orifice	PB	Cast Iron	Plant Indoor Air (External)	Loss of material	External Surfaces Monitoring program (B2.1.36)	VII.I-8	3.3.1.58	B
Valve	PB	Copper Alloy	Plant Indoor Air (Internal)	None	None	None	None	G

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Source: RAI 2.4-1 Response

LRA Table 2.4-7, Main Steam Support Structure (pages 2.4-16 and 2.4-17), is revised as follows (new text underlined):

Table 2.4-7 Main Steam Support Structure

Component Type	Intended Function
Caulking/Sealant	Flood Barrier Shelter, Protection
Compressible Joints/Seals	Expansion/Separation Shelter, Protection
Concrete Elements	Fire Barrier Flood Barrier HELB Shielding Missile Barrier Shelter, Protection Shielding Structural Pressure Boundary Structural Support
Doors	Flood Barrier HELB Shielding Missile Barrier Shelter, Protection Structural Pressure Boundary
Fire Barrier Coatings/Wraps	Fire Barrier
Fire Barrier Doors	Fire Barrier Shelter, Protection
Fire Barrier Seals	Fire Barrier
Hatch	Flood Barrier HELB Shielding Shelter, Protection Structural Pressure Boundary
Hatches/Plugs	Missile Barrier Shelter, Protection
Penetrations Electrical	Structural Support
Penetrations Mechanical	Structural Support
Roofing Membrane	Shelter, Protection
Stairs/Platforms/Grates	Non-S/R Structural Support
Structural Steel	Shelter, Protection Structural Support

Source: RAI 2.4-1 Response

LRA Section 3.5.2.1.7, Main Steam Support Structure, Materials (page 3.5-10), is revised as follows (new text underlined):

Materials

The materials of construction for the main steam support structure component types are:

- Carbon Steel
- Concrete
- Elastomer
- Thermo-Lag

Source: RAI 2.4-1 Response

LRA Section 3.5.2.1.7, Main Steam Support Structure, Aging Effects Requiring Management (pages 3.5-10 and 3.5-11), is revised as follows (new text underlined):

Aging Effects Requiring Management

The following main steam support structure aging effects require management:

- Concrete cracking and spalling
- Cracking due to expansion
- Cracking, loss of bond, and loss of material (spalling, scaling)
- Cracks and distortion
- Increase in porosity and permeability, cracking, loss of material (spalling, scaling)
- Increased hardness, shrinkage and loss of strength
- Loss of material
- Loss of material, cracking
- Loss of material (spalling, scaling) and cracking
- Loss of sealing

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Source: RAI 2.4-1 Response

LRA Table 3.5.2-7, Containments, Structures, and Component Supports – Summary of Aging Management Evaluation – Main Steam Support Structure (pages 3.5-92 through 3.5-98), is revised to include the following (new text underlined):

Table 3.5.2-7 Containments, Structures, and Component Supports – Summary of Aging Management Evaluation – Main Steam Support Structure

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Fire Barrier Coatings/ Wraps	FB	Thermo-Lag	Plant Indoor Air (Structural) (Ext)	Loss of material, cracking	Fire Protection (B2.1.12)	None	None	J, 1

Notes for Table 3.5.2-7:
Standard Notes:

J Neither the component nor the material and environment combination is evaluated in NUREG-1801.

Plant Specific Notes:
~~None~~
1 NUREG-1801 does not address aging of Thermo-Lag materials.