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SUBJECT: Requests exemption from 10CFR70.24, criticality accident requirements.

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10 CFR 70.14(a)
10 CFR 70.24(d)

Palo Verde Nuclear
Generating Station

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102-03904-JML/AKK/GAM
March 28, 1997

Dear Sirs:

**Subject: Palo Verde Nuclear Generating Station (PVNGS)
Units 1, 2, and 3
Docket Nos. STN 50-528/529/530
Request for Exemption from 10 CFR 70.24, Criticality Accident
Requirements**

Pursuant to 10 CFR 70.24(d), Arizona Public Service Company (APS) requests an exemption from the requirements of 10 CFR 70.24 for PVNGS Units 1, 2, and 3, as authorized by 10 CFR 70.14(a). The proposed action would exempt APS from the requirements of 10 CFR 70.24 to maintain a radiation monitoring system that will energize clearly audible alarm signals if accidental criticality occurs in each area where licensed special nuclear material is handled, used, or stored. The proposed action would also exempt APS from the requirements to maintain emergency procedures for each area in which licensed special nuclear material is handled, used, or stored to ensure that all personnel withdraw to an area of safety upon the sounding of the alarm, to conduct drills to familiarize personnel with the evacuation plan, to designate responsible individuals for determining the cause of the alarm, and to place radiation survey instruments in accessible locations for use in such an emergency.

The NRC previously granted exemptions from 10 CFR 70.24 to APS in the PVNGS Units 1, 2, and 3 Special Nuclear Material (Part 70) Licenses. These exemptions were based on APS's demonstration of subcriticality under normal and accident conditions and the inherent features associated with the storage and inspection of unirradiated nuclear power plant fuel when no fuel processing activities are to be performed. The bases for the exemptions continue to exist, but the exemptions were inadvertently not included in the Part 50 operating licenses that superseded the SNM licenses. This exemption request is also consistent with the guidance of Regulatory Guide 8.12, Revision 1, "Criticality Accident Alarm Systems."

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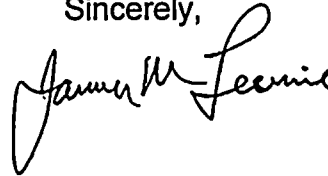
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APS requests that this exemption request be reviewed and approved by June 15, 1997, to support receipt of new fuel for the Unit 2 refueling outage. Should you have any questions, please contact Scott A. Bauer at (602) 393-5978.

Sincerely,

A handwritten signature in cursive script, appearing to read "James M. Leemie".

JML/AKK/GAM/rjh

cc: E. W. Merschoff
K. E. Perkins
J. W. Clifford
K. E. Johnston

ENCLOSURE

**REQUEST FOR EXEMPTION FROM 10 CFR 70.24,
CRITICALITY ACCIDENT REQUIREMENTS**

REQUEST FOR EXEMPTION FROM 10 CFR 70.24, CRITICALITY ACCIDENT REQUIREMENTS

BACKGROUND

10 CFR 70.24 specifies criticality accident requirements for areas in which licensed special nuclear material is handled, used, or stored. These requirements include maintaining a radiation monitoring system with an audible alarm in the event of accidental criticality, emergency procedures for evacuation upon the sounding of the alarm, and the conduct of evacuation drills. This section is not intended to require underwater monitoring when special nuclear material is handled or stored beneath water shielding or to require monitoring systems when special nuclear material is being transported when packaged in accordance with the requirements of 10 CFR 71.

The NRC previously granted exemptions from 10 CFR 70.24 to APS in the PVNGS Units 1, 2, and 3 Part 70 Special Nuclear Material (SNM) Licenses. These exemptions were based on APS's demonstration of subcriticality under normal and accident conditions and the inherent features associated with the storage and inspection of unirradiated nuclear power plant fuel when no fuel processing activities are to be performed. The bases for the exemptions continue to exist, but the exemptions were inadvertently not included in Part 50 licenses that superseded the SNM licenses.

Regulatory Guide 8.12, Revision 1, Criticality Accident Alarm Systems, provides the NRC guidance for meeting 10 CFR 70.24 requirements for a criticality accident alarm system. Section B, Discussion, states that where geometric spacing is used to preclude criticality, such as in some storage spaces for unirradiated nuclear power plant fuel, alarms are not needed. Section C, Regulatory Position, Paragraph 1, states that when the need for criticality alarms has been evaluated and it is determined that a potential for criticality does not exist, as for example where geometric spacing is used to preclude criticality, such as in some storage spaces for unirradiated nuclear power plant fuel, it is appropriate to request an exemption from Section 70.24.

EXEMPTION REQUEST

Pursuant to 10 CFR 70.24(d), Arizona Public Service Company (APS) requests an exemption from the requirements of 10 CFR 70.24(a) for PVNGS Units 1, 2, and 3, as authorized by 10 CFR 70.14(a). The proposed action would exempt APS from the requirements of 10 CFR 70.24 to maintain a radiation monitoring system in each area where licensed special nuclear material is handled, used, or stored that will energize clearly audible alarm signals if accidental criticality occurs. The proposed action would

also exempt APS from the requirements to maintain emergency procedures for each area in which licensed special nuclear material is handled, used, or stored to ensure that all personnel withdraw to an area of safety upon the sounding of the alarm, to conduct drills to familiarize personnel with the evacuation plan, to designate responsible individuals for determining the cause of the alarm, and to place radiation survey instruments in accessible locations for use in such an emergency.

Power reactor license applicants are evaluated for the safe handling, use, and storage of special nuclear materials. The proposed exemption from the criticality accident requirements of 10 CFR 70.24 is based on the original and current design for fuel storage and handling at PVNGS Units 1, 2, and 3. The exemption was granted by the NRC in the original Part 70 SNM licenses for the PVNGS Units, but they were inadvertently not included in Part 50 operating licenses that superseded the SNM licenses.

Inadvertent or accidental criticality is precluded through compliance with the PVNGS Technical Specifications, the design of the fuel storage racks providing geometric spacing of fuel assemblies in their storage locations, and administrative controls imposed on fuel handling procedures. Technical Specification requirements specify reactivity limits for the fuel storage racks and minimum spacing between the fuel assemblies in the storage racks.

10 CFR 50, Appendix A - General Design Criteria for Nuclear Power Plants, Criterion 62, requires that criticality in the fuel storage and handling system shall be prevented by physical systems or processes, preferably by use of geometrically safe configurations. This is met at PVNGS, as identified in the Technical Specifications and the Updated Final Safety Analysis Report (UFSAR). PVNGS Technical Specifications Section 5.3.1.3¹ states that the new fuel storage racks are designed and shall be maintained with $K(\text{eff})$ less than or equal to 0.95 if fully flooded with unborated water, and less than or equal to 0.98 if moderated by aqueous foam, and a nominal 17 inch center to center distance between fuel assemblies placed in the storage racks. UFSAR Section 9.1.1.1, New Fuel Storage Design Bases, states that accidental criticality shall be prevented for the most reactive arrangement of new fuel stored, with optimum moderation, by assuring that $K(\text{eff})$ is less than 0.98 under normal and accident conditions. UFSAR Section 9.1.1.3, Safety Evaluation, states that the new fuel rack design and location ensures that the design bases of paragraph 9.1.1.1 are met.

The proposed exemption would not result in any significant radiological impacts. The proposed exemption would not affect radiological plant effluents nor cause any significant occupational exposures since the Technical Specifications, design controls (including

¹ Due to a typographical error, Section 5.3.1.3 in PVNGS Units 1, 2, and 3 Technical Specifications is incorrectly numbered 5.2.1.3. Also, the new fuel storage rack requirements are in Section 4.3.1.2 of the Improved Technical Specifications for PVNGS, submitted to NRC in an amendment request on October 4, 1996.

geometric spacing of fuel assembly storage spaces) and administrative controls preclude inadvertent criticality. The amount of radioactive waste would not be changed by the proposed exemption.

The proposed exemption does not result in any significant nonradiological environmental impacts. The proposed exemption involves features located entirely within the restricted area as defined in 10 CFR Part 20. It does not affect nonradiological plant effluents and has no other environmental impact.

CONCLUSION

This exemption from the criticality accident requirements of 10 CFR 70.24 is requested because (1) the exemption was previously issued to PVNGS Units 1, 2, and 3 in the Part 70 SNM licenses and the bases for those exemptions continue to exist; (2) the exemption is consistent with the NRC Regulatory Guide 8.12, Revision 1, position that an exemption request is appropriate where geometric spacing in new fuel storage spaces is used to preclude criticality; and (3) criticality in the fuel storage and handling system is prevented by physical systems or processes, in compliance with GDC 62 of 10 CFR 50, Appendix A, by Technical Specifications, design features, and administrative controls imposed on fuel handling procedures. As such, the proposed exemption meets the provisions of 10 CFR 70.14 (a) in that it will not endanger life or property or the common defense and security.

APS requests that this exemption request be reviewed and approved by June 15, 1997, to support receipt of new fuel for the Unit 2 refueling outage.