

regulatory positions on dose modeling, methods for conducting final status surveys, as low as reasonably achievable analysis, and license termination under restricted conditions. DG-4006 also discussed how these regulatory positions should be integrated during license termination activities. NRC staff initially intended to finalize the DG by July 2000. In September 1999, NRC staff stated that it would accept comments on DG-4006 until November 1999. NRC staff received approximately 185 comments on DG-4006 from four professional organizations, one Federal agency, three State regulatory agencies and the Conference of Radiation Control Program Directors, and two private concerns.

In late 1999, NRC staff, in recognition that similar guidance was being presented in the SRP, decided to combine the guidance in DG-4006 with the guidance in the SRP and use the SRP as the primary guidance document. This action will aid in consolidating decommissioning guidance in a user-friendly manner. As such, NRC staff does not plan to publish a final version of the Regulatory Guide. Comments submitted by interested individuals on DG-4006 will be considered as NRC staff finalizes the SRP.

**FOR FURTHER INFORMATION CONTACT:** Dominick A. Orlando, Decommissioning Branch, Division of Waste Management, Office of Nuclear Material Safety and Safeguards, at (301) 415-6749.

Dated at Rockville, Maryland, this 24th day of February 2000.

For the Nuclear Regulatory Commission.

**Michael C. Layton,**

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Nuclear Material Safety and Safeguards.*

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## **NUCLEAR REGULATORY COMMISSION**

**[Docket Nos. STN 50-528, STN 50-529, and  
STN 50-530]**

### **Arizona Public Service Company; Palo Verde Nuclear Generating Station, Units 1, 2, and 3, Environmental Assessment and Finding of No Significant Impact**

The U.S. Nuclear Regulatory Commission (NRC) is considering issuance of an amendment to Facility Operating Licenses Nos. NPF-41, NPF-51, and NPF-74, issued to the Arizona Public Service Company (the licensee), for operation of the Palo Verde Nuclear Generating Station (Palo Verde), Units 1,

2, and 3, located in Maricopa County, Arizona.

### **Environmental Assessment**

#### *Identification of Proposed Action*

The proposed action would increase the number of fuel assemblies that can be stored in the Palo Verde spent fuel pools (SFPs) from 1034 fuel assemblies per SFP (1033 fuel assemblies for the Unit 2 SFP) to 1205 fuel assemblies per SFP. The increase in storage capacity is based on taking credit for fuel assembly burnup, for soluble boron, and for fuel assembly configuration in the SFP. In addition, the proposed action would increase the maximum radially averaged fuel enrichment from 4.3 weight percent to 4.8 weight percent.

The proposed action is in accordance with the licensee's application for amendments dated June 8, 1999, as supplemented by letters dated July 20 and November 24, 1999.

#### *The Need for the Proposed Action*

The licensee is planning on implementing dry cask storage in the second half of 2002. Since all three Palo Verde SFPs will lose the capacity to fully offload the core prior to that time, the licensee needs to increase the maximum number of fuel assemblies that can be stored in the SFPs. The higher enrichment limit is needed to provide flexibility in future core designs.

#### *Environmental Impacts of the Proposed Action*

##### **Thermal Impact**

The change in temperature of the SFP water was evaluated for the potential increase in reactivity. The current design basis for the SFP cooling system is based on the proposed increased capacity of the SFP, so no significant increase in SFP temperature is expected. In addition, because the reactivity coefficient in the SFP is negative, a temperature increase will result in a decrease in reactivity. Since increasing the capacity of the SFPs would increase the maximum heat load, the pool temperature would tend to be higher, not lower, after the proposed action was implemented. Therefore, the thermal impact of the proposed action would tend to increase the ability of the SFP system to maintain criticality parameters within the design bases of the plants.

The increased heat loads that result from increasing the SFP capacity would cause the total heat load rejected to the environment to increase. The maximum increase in heat rejection to the environment is less than 0.1 percent of

the total heat load rejected to the environment by an operating Palo Verde unit, and is not considered a significant impact to the environment.

##### **Radioactive Waste Treatment**

The Palo Verde units use waste treatment systems designed to collect and process gaseous, liquid, and solid waste that might contain radioactive material. These radioactive waste treatment systems were evaluated in the Final Environmental Statement (FES) dated February 1982 (NUREG-0841). The proposed increase in the capacity of the SFPs and the proposed increase in the enrichment limit will not involve any change in the waste treatment systems described in the FES.

##### **Gaseous Radioactive Wastes**

The storage of additional and higher enriched spent fuel assemblies in the pools is not expected to affect the releases of radioactive gases from the SFPs. Gaseous fission products such as krypton-85 and iodine-131 are produced by the fuel in the core during reactor operation. A small percentage of these fission gases is released to the reactor coolant from the small number of fuel assemblies that are expected to develop leaks during reactor operation. During refueling operations, some of these fission products enter the pools and are subsequently released into the air. Since the frequency of refueling (and, therefore, the number of freshly offloaded spent fuel assemblies stored in the pools at any one time) will not increase, there would be no increase in the amounts of these types of fission products released to the atmosphere as a result of the increased pool fuel storage capacity.

The increased heat load on the pools from the storage of additional spent fuel assemblies would potentially result in an increase in the pools' evaporation rate. However, this increased evaporation rate is not expected to result in an increase in the amount of gaseous tritium released from the pool. The overall release of radioactive gases from Palo Verde would remain a small fraction of the limits of 10 CFR 20.1301.

##### **Solid Radioactive Wastes**

Spent resins are generated by the processing of SFP water through the pools' purification system. These spent resins are disposed of as solid radioactive waste. Resin replacement is determined primarily by the requirement for water clarity and is normally done approximately once per year. No significant increase in the volume of solid radioactive waste is

expected with the expanded storage capacity.

#### Liquid Radioactive Wastes

The release of radioactive liquids would not be affected directly as a result of increasing the capacity of the SFPs. The SFP ion exchanger resins remove soluble radioactive materials from the pool water. When the resins are replaced, the small amount of resin sluice water that is released is processed by the radwaste systems. Resin replacement is determined primarily by the requirement for water clarity and is normally done approximately once per year. The increase in the amount of radioactive liquid released to the environment as a result of increasing the capacity of the SFPs is expected to be negligible.

#### Occupational Dose Consideration

There are no physical modifications needed to increase the capacity of the Palo Verde SFPs, so no increase in occupational doses will result from this proposed action. The existing procedures for normal activities associated with handling fuel assemblies limit the radiological exposure for plant workers, and these limits are not affected by the higher enrichment limits or increased SFP capacity.

#### Accident Considerations

The licensee evaluated three events related to the proposed action to verify that the previous accident analyses as incorporated in the plants' design bases remain bounding. They are a fuel handling accident, a fuel misloading event, and a boron dilution event.

The design-basis fuel handling accident is the dropping of a single fuel assembly during fuel handling. Increasing the SFP capacity and increasing the enrichment limit does not affect the method of handling spent fuel or the design of the fuel handling equipment. The fuel assembly design (clad material and structural components) is not affected by this change. The equilibrium source term used in the fuel handling accident analysis is based on rated core thermal power and an infinite cycle, and therefore is independent of fuel assembly enrichment. Therefore, the radiological consequences of the fuel handling accident remains unchanged.

The effect of a single misloaded spent fuel assembly on the SFP maximum effective multiplication factor has been analyzed and shown to remain within the design limit for this parameter ( $\leq 0.95$ ). Therefore, the radiological

consequences of a misloaded fuel assembly remains unchanged.

Analyses were conducted to evaluate the possibility of unacceptable dilution of the soluble boron in the SFPs due to operational events or accidents. The analyses verified that the SFP maximum effective multiplication factor remained  $\leq 0.95$  for all credible accident scenarios. Therefore, the proposed action will not result in a criticality event and no increases in radiological consequences will occur as a result of a boron dilution event.

The NRC has reviewed the above analyses conducted by the licensee and concludes that increases in the enrichment limit and in the capacity of the SFPs at Palo Verde will not be accompanied by an associated increase in the radiological consequences of fuel-handling accidents. The potential offsite doses will not be increased over the values given in the updated Final Safety Analysis Report.

#### Environmental Impact Conclusions

The proposed action will not increase the probability or consequences of accidents, no changes are being made in the types of any effluents that may be released off site, and there is no significant increase in occupational or public radiation exposure. Therefore, there are no significant radiological environmental impacts associated with the proposed action.

With regard to potential nonradiological impacts, the proposed action does not involve any historic sites. It does not affect nonradiological plant effluents and has no other environmental impacts. Therefore, there are no significant nonradiological environmental impacts associated with the proposed action.

Accordingly, the NRC concludes that there are no significant environmental impacts associated with this action.

#### Alternatives to the Proposed Action

##### Shipping Fuel to a Permanent Federal Fuel Storage/Disposal Facility

Shipment of spent fuel to a high-level radioactive storage facility is an alternative to increasing the onsite spent fuel storage capacity. However, the U.S. Department of Energy's (DOE's) high-level radioactive waste repository is not expected to begin receiving spent fuel until approximately 2010, at the earliest. To date, no location has been identified and an interim Federal storage facility has yet to be identified in advance of a decision on a permanent repository. Therefore, shipping the spent fuel to the DOE repository is not considered a viable alternative to increased onsite fuel storage capacity at this time.

##### Shipping Fuel to a Reprocessing Facility

Reprocessing of spent fuel from Palo Verde is not a viable alternative since there are no operating commercial reprocessing facilities in the United States. Therefore, spent fuel would have to be shipped to an overseas facility for reprocessing. However, this approach has never been used and it would require approval by the Department of State as well as other entities. Additionally, the cost of spent fuel reprocessing is not offset by the salvage value of the residual uranium; reprocessing represents an added cost.

##### Shipping the Fuel Offsite to Another Utility

The shipment of fuel to another utility would provide short-term relief from the fuel storage problems at Palo Verde. The Nuclear Waste Policy Act of 1982, Subtitle B Section 131(a)(1), however, clearly places the responsibility for the interim storage of spent fuel with each owner or operator of a nuclear plant. The SFPs at the other reactor sites were designed with capacity to accommodate spent fuel from those particular sites. Therefore, transferring spent fuel from Palo Verde to other sites would create storage capacity problems at those locations.

##### Alternatives Creating Additional Storage Capacity

Alternative technologies that would create additional storage capacity include rod consolidation, dry cask storage, modular vault dry storage, and constructing a new pool. Rod consolidation involves disassembling the spent fuel assemblies and storing the fuel rods from two or more assemblies into a stainless steel canister that can be stored in the spent fuel racks. Industry experience with rod consolidation is currently limited, primarily due to concerns for potential gap activity release due to rod breakage, the potential for increased fuel cladding corrosion due to some of the protective oxide layer being scraped off, and because the prolonged consolidation activity could interfere with ongoing plant operations. Dry cask storage is a method of transferring spent fuel, after storage in the pool for several years, to high capacity casks with passive heat dissipation features. The licensee is planning on implementing dry cask storage at the Palo Verde site, but the SFPs will lose the capacity to fully offload the core prior to the time dry cask storage will be available. Vault storage consists of storing spent fuel in shielded stainless steel cylinders in a horizontal configuration in a reinforced

concrete vault. The concrete vault provides missile and earthquake protection and radiation shielding. Concerns for vault dry storage include security, land consumption, eventual decommissioning of the new vault, and high cost. The alternative of constructing and licensing new SFPs is not practical for Palo Verde because such an effort would require about 10 years to complete and would not be available in the time frame needed.

The alternative technologies that could create additional storage capacity involve additional fuel handling with an attendant opportunity for a fuel handling accident, involve higher cumulative dose to workers affecting the fuel transfers, require additional security measures that are significantly more expensive, and would not result in a significant improvement in environmental impacts compared to the proposed action to increase the capacity of the current SFPs.

#### Reduction of Spent Fuel Generation

Generally, improved usage of the fuel and/or operation at a reduced power level would be an alternative that would decrease the amount of fuel being stored in the SFPs and, thus, increase the amount of time before the maximum storage capacities of the SFPs are reached. However, operating the plant at a reduced power level would not make effective use of available resources, and would cause unnecessary economic hardship on the licensee and its customers. Therefore, reducing the amount of spent fuel generated by increasing burnup further or reducing power is not considered a practical alternative.

#### The No-Action Alternative

The NRC staff also considered denial of the proposed action (i.e., the "no-action" alternative). Denial of the application would result in no significant change in current environmental impacts. The environmental impacts of the proposed action and the alternative action are similar.

#### Alternative Use of Resources

This action does not involve the use of any resources not previously considered in the Final Environmental Statement for Palo Verde, Units 1, 2, and 3.

#### Agencies and Persons Contacted

In accordance with its stated policy, on January 27, 2000, the staff consulted with the Arizona State official, Mr. Audbry Godwin of the Arizona Radiation Protection Agency, regarding

the environmental impact of the proposed action. The State official had no comments.

#### Finding of No Significant Impact

On the basis of the environmental assessment, the NRC concludes that the proposed action will not have a significant effect on the quality of the human environment. Accordingly, the NRC has determined not to prepare an environmental impact statement for the proposed action.

For further details with respect to the proposed action, see the licensee's letters dated June 8, July 20, and November 24, 1999, which are available for public inspection at the Commission's Public Document Room, Gelman Building, 2120 L Street, NW., Washington DC. Publicly available records will be accessible electronically from the ADAMS Public Library component on the NRC Web site, <http://www.nrc.gov> (the Electronic Reading Room).

Dated at Rockville, Maryland, this 24th day of February 2000.

For the Nuclear Regulatory Commission.

**Mel B. Fields,**

*Project Manager, Section 2, Project Directorate IV & Decommissioning Division of Licensing Project Management, Office of Nuclear Reactor Regulation.*

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## NUCLEAR REGULATORY COMMISSION

[Docket No. 72-1026]

### **BNFL Fuel Solutions Corporation; Issuance of Environmental Assessment and Finding of No Significant Impact Regarding the Proposed Exemption From Requirements of 10 CFR Part 72**

By letter dated January 14, 2000, BNFL Fuel Solutions Corporation (BFS or applicant) requested an exemption, pursuant to 10 CFR 72.7, from the requirements of 10 CFR 72.234(c). BFS, located in Scotts Valley, California, is seeking Nuclear Regulatory Commission (NRC or the Commission) approval to procure materials for and fabricate 14 Wesflex W150 storage casks prior to receipt of a Certificate of Compliance (CoC) for the Wesflex Spent Fuel Management System (Wesflex System). The Wesflex storage cask is a basic component of the Wesflex System, a cask system designed for the dry storage of spent fuel. The Wesflex System is intended for use under the general license provisions of Subpart K of 10 CFR part 72 by Consumers Energy at the

Palisades Nuclear Plant, located in Covert, Michigan, and at the Big Rock Point Nuclear Plant, located in Charlevoix, Michigan. The application for the CoC was submitted by BFS to the Commission on February 3, 1998, as supplemented.

#### Environmental Assessment (EA)

##### *Identification of Proposed Action*

BFS is seeking Commission approval to procure materials for and fabricate 14 Wesflex W150 storage casks prior to receipt of the CoC. The applicant is requesting an exemption from the requirements of 10 CFR 72.234(c), which states that "Fabrication of casks under the Certificate of Compliance must not start prior to receipt of the Certificate of Compliance for the cask model." The proposed action before the Commission is whether to grant this exemption under 10 CFR 72.7.

##### *Need for the Proposed Action*

BFS requested the exemption to 10 CFR 72.234(c) to ensure the availability of storage casks so that Consumers Energy can maintain full core offload capability at the Palisades Nuclear Plant. Palisades will lose full core offload capability after its planned April 2001 refueling outage. Currently, the Ventilated Storage Cask—24 (VSC-24), fabricated by Sierra Nuclear Corporation, is used at Palisades for the dry storage of spent fuel. However, the licensee requires another cask option because the storage capability of the VSC-24 is limited by its burnup and enrichment requirements. Beyond April 2001, a significant portion of the remaining and future spent fuel inventory at Palisades will not meet the VSC-24 burnup and enrichment limits. Already, there are nearly 250 spent fuel assemblies at Palisades that do not qualify for storage in the VSC-24.

BFS is also requesting the exemption to ensure the availability of dry storage casks at Big Rock Point to support its decommissioning schedule. The Big Rock Point decommissioning schedule requires that all fuel be loaded into dry storage casks by 2002.

To maintain full core offload at Palisades and to meet Big Rock Point's decommissioning schedule, Consumers Energy anticipates that fuel loading of Wesflex Systems would need to begin in 2001 at both sites. Thus, at both Palisades and Big Rock Point, the availability of the Wesflex System is needed in 2000 to support training and dry runs in anticipation of loading fuel in the following year. To meet this schedule, procurement of the W150