UNITED STATES NUCLEAR REGULATORY COMMISSION

POWER AUTHORITY OF THE STATE OF NEW YORK

DOCKET NO. 50-333

JAMES A. FITZPATRICK NUCLEAR POWER PLANT

ENVIRONMENTAL ASSESSMENT AND FINDING OF

NO SIGNIFICANT IMPACT

The U.S. Nuclear Regulatory Commission (the Commission) is considering issuance of an amendment to Facility Operating License No. DPR-59, issued to the Power Authority of the State of New York (PASNY) (the licensee, also known as the New York Power Authority), for operation of the James A. FitzPatrick Nuclear Power Plant, located in Oswego County, New York.

ENVIRONMENTAL ASSESSMENT

Identification of the Proposed Action:

The proposed action would modify the spent fuel pool (SFP) by installation of an additional 7 new high density storage rack modules for fuel storage in the SFP. The additional rack modules will increase the FitzPatrick SFP capacity from 2797 to 3239 fuel assemblies.

The proposed action is in accordance with the licensee's application for amendment dated October 14, 1997, as supplemented on July 23, 1998, December 3, 1998, February 25, 1999, and September 29, 1999.

The Need for the Proposed Action:

The proposed action is needed to provide for storage of spent fuel until the licensee installs and obtains a license for an interim spent fuel storage installation (IFSFI). The underlying purpose of the expansion is to provide interim additional storage capacity for spent fuel to allow for continued operation until additional methods of storing spent fuel have been established.

Environmental Impacts of the Proposed Action:

The factors considered in this determination are discussed below.

Radioactive Waste Treatment

FitzPatrick uses waste treatment systems designed to collect and process gaseous, liquid, and solid waste that might contain radioactive material. These radioactive waste treatment systems are evaluated in the Final Environmental Statement (FES) dated March 1973. The proposed SFP expansion will not involve any change in the waste treatment systems described in the FES.

Radioactive Material Released to the Atmosphere

The storage of additional spent fuel assemblies in the SFP is not expected to affect the releases of radioactive gases from the SFP. 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 may be released to the reactor coolant from fuel assemblies which may develop leaks during reactor operation. During refueling operations, some of these fission products may enter the SFP and subsequently be released into the air. However, as the frequency of refuelings will not be increased by the proposed action, there will be no increase in the amount of radioactive material released to the atmosphere during these operations.

Experience has demonstrated that during the period between refueling outages there is no longer a significant release of fission products from stored fuel. The storage of additional fuel

assemblies in the SFP will not increase the SFP bulk water temperature beyond the existing design temperature. Therefore, radioactive material airborne release rates due to evaporation from the SFP are not expected to increase.

Solid Radioactive Wastes

Spent resins are generated by the processing of SFP water through the SFP purification system. These spent resins are disposed of as solid radioactive waste. The frequency of resin changeout may increase slightly during the installation of the new racks due to the possibility of resuspension of particulate matter in the SFP (due to turbulence caused by the SFP rack installations). The licensee will use a Tri-Nuke underwater filtration unit to clean the floor of the SFP during SFP rack installation. Vacuuming of the SFP floor will remove any extraneous debris and crud and ensure visual clarity in the SFP (to facilitate diving operations, if needed, and installation of the SFP racks). Debris and crud will be filtered and collected in the Tri-Nuke filters and stored underwater. Depending on the waste characterization of these filters, the licensee will dispose of them utilizing shielded canisters and high integrity containers which will then be stored onsite or shipped for burial accordingly. The staff does not expect that the additional fuel storage made possible by the increased SFP storage capacity will result in a significant change in the generation of solid radwaste.

Liquid Radioactive Wastes

The release of radioactive liquids will not be affected directly as a result of the modifications. The SFP ion exchanger resins remove soluble radioactive materials from the SFP water. When the resins are changed out, the small amount of resin sluice water which is released is processed by the radwaste system. As stated above, the frequency of resin changeout may increase slightly during the installation of the new racks. However, the amount of radioactive liquid released to the environment as a result of the proposed SFP expansion is expected to be negligible.

Radiological Impact Assessment

Radiation Protection personnel will constantly monitor the doses to the workers during the SFP expansion operation. The total occupational dose to plant workers as a result of the SFP expansion operation is estimated to be between 3 and 4 person-rem. Since the proposed action does not involve the removal of any spent fuel racks, the licensee does not plan on using divers for this project. However, if it becomes necessary to utilize divers to remove any interferences which may impede the installation of the new spent fuel racks, the licensee will equip each diver with radiation detectors with remote, above surface, readouts which will be continuously monitored by Radiation Protection personnel. This dose estimate is comparable to doses for similar SFP modifications performed at other plants. The proposed SFP rack installation will follow detailed procedures prepared with full consideration of as low as is reasonably achievable (ALARA) principles.

On the basis of our review of the FitzPatrick proposal, the staff concludes that the FitzPatrick SFP rack installation can be performed in a manner that will ensure that doses to workers will be maintained ALARA. The estimated dose of 3 to 4 person-rem to perform the proposed SFP rack installation is a small fraction of the annual collective dose accrued at FitzPatrick.

ACCIDENT CONSIDERATIONS

In its application, the licensee evaluated the possible consequences of a fuel handling accident to determine the thyroid and whole-body doses at the Exclusion Area Boundary (EAB), Low Population Zone (LPZ), and Control Room. The proposed SFP rack installation at the FitzPatrick Nuclear Power Plant will not affect any of the assumptions or inputs used in evaluating the dose consequences of a fuel handling accident and therefore will not result in an increase in the doses from a postulated fuel handling accident.

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 offsite, 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 impact. Therefore, there are no significant nonradiological environmental impacts associated with the proposed action.

Accordingly, the Commission concludes that there are no significant environmental impacts associated with the proposed action.

Alternatives to the Proposed Action:

Shipping Fuel to a Permanent Federal Fuel Storage/Disposal Facility

Shipment of spent fuel to the permanent repository or a centralized high-level radioactive waste storage facility is an alternative to increasing onsite spent fuel storage capacity. However, the U.S. Department of Energy (DOE) is not expected to open the permanent repository until 2010 and is currently prohibited from selecting a site for centralized storage until after a determination is made on permanent repository site suitability. Congress, with the urging of some affected utilities and States, has recently taken up proposed changes to the Federal program that would integrate storage and disposal at one site and require DOE to construct an interim storage facility. No decision has yet been made on centralized federal storage that would provide a basis for evaluating it as a viable alternative to the Power Authority's proposed action.

Shipping Fuel to a Reprocessing Facility

Reprocessing of spent fuel from the FitzPatrick plant is not a viable alternative since there are no operating commercial reprocessing facilities in the United States. Spent fuel would have to be shipped to an overseas facility for reprocessing. This approach has never been used and

it would require approval by the U.S. 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 and reprocessing represents an added cost. Therefore, this alternative is considered unacceptable.

Shipping Fuel to Another Utility or Site or to Indian Point 3 (IP3) for Storage

Shipment of irradiated fuel from FitzPatrick for storage at the IP3 fuel pool would provide short-term relief from the storage problem at FitzPatrick. However, this transfer of fuel between units would create no additional storage locations for irradiated fuel, nor would it eliminate the need to develop additional spent fuel storage capability at FitzPatrick in the future. As a result, any fuel transfer would accelerate the loss of fuel pool storage at the IP3 and give no benefit to either facility.

Currently, the IP3 site has installed fuel pool storage capacity sufficient to handle site requirements for irradiated fuel storage, while maintaining full core discharge capability until approximately the year 2009. The design of the IP3 fuel pool storage racks has been optimized for storage of pressurized-water reactor fuel with a different physical and nuclear design than the boiling-water reactor fuel used at FitzPatrick. Thus, storage of FitzPatrick fuel at IP3 would both limit storage of future discharged IP3 fuel and represent a less then optimal use of the existing IP3 storage capability.

PASNY knows of no other utility that is prepared to accept shipments of irradiated fuel from FitzPatrick for long-term storage at its site.

For these reasons, and considering the increased fuel handling and additional occupational radiation exposure incurred during the shipment of irradiated fuel, the alternative of shipping FitzPatrick fuel to IP3 or other site for storage is not an acceptable alternative to the proposed action.

Alternatives Creating Additional Storage Capacity

A variety of alternatives to increase the storage capacity of the FitzPatrick SFP were considered. Fuel rod consolidation was considered as a potential alternative and was eliminated because of the limited industry experience in disassembling irradiated fuel and because of the potential for fission product release due to rod breakage during disassembly. Additionally, because DOE considers consolidated fuel to be a non-standard waste form, the licensee could be concerned that the presence of fuel in this form would cause DOE to delay its acceptance of waste from FitzPatrick.

The early implementation of dry cask storage for irradiated fuel at FitzPatrick was also considered. Dry cask storage involves transferring irradiated fuel, after several years of storage in the FitzPatrick SFP, to high capacity casks with passive heat dissipation features. After loading, these casks would be placed on a concrete pad at an outdoor location on the FitzPatrick site. Although dry cask storage is planned by the licensee as a long-term storage option for FitzPatrick, the early implementation of this alternative was rejected by the licensee because the 442 storage locations provide needed irradiated fuel storage with less environmental impact and at lower cost.

As a result, the licensee concluded that none of the alternative technologies that could create additional spent fuel storage capacity at FitzPatrick could do so with less environmental impact than the impacts associated with the chosen option.

Reduction of Spent Fuel Generation

To minimize the quantities of irradiated fuel generated during full power operation at FitzPatrick, the licensee has developed efficient fuel loading patterns that seek to maximize the utilization of each assembly consistent with limits on the integrated fuel rod exposure. Batch discharge burnups for FitzPatrick fuel currently exceed 40 GWD/MT with peak assembly burnups reaching 46 GWD/MT by the time of discharge. The licensee expects batch average

discharge exposure to exceed 43 GWD/MT after the current cycle and to increase to 45 GWD/MT thereafter. FitzPatrick depletes fuel assemblies to these burnups with minimal cladding perforations so that the fission product inventory present in the SFP water remains low. The high values of batch average and peak assembly discharge burnup ensure that the electricity generated by FitzPatrick yields the minimum possible amount of spent fuel.

The fuel assembly design used at FitzPatrick is not compatible with the IP3 core. As a result, partially irradiated fuel from other PASNY nuclear units cannot be used at FitzPatrick (or vice versa) to reduce the rate of spent fuel discharge.

Operation of FitzPatrick at a reduced power level for long periods of time would extend the existing SFP storage capacity. However, to compensate for the reduced generation by FitzPatrick another power generation facility would be required to increase its power output, possibly resulting in an increase in airborne pollution and greenhouse gas emissions. The adverse environmental impact of increased airborne pollution and greenhouse gas omissions resulting from a long-term derate of FitzPatrick generating capacity is significantly greater than the environmental impact associated with increasing the storage capacity of the existing FitzPatrick SPF.

The No-Action Alternative

As an alternative to the proposed action, the NRC staff 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 FitzPatrick.

Agencies and Persons Consulted:

In accordance with its stated policy, on May 24, 1999, the NRC staff consulted with the New York State official, Mr. Jack Spath, of the New York State Research and Development Authority, 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 Commission concludes that the proposed action will not have a significant effect on the quality of the human environment. Accordingly, the Commission 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 letter dated October 14, 1997, as supplemented by letters dated July 23, 1998, December 3, 1998, February 25, 1999, and September 29, 1999, which are available for public inspection at the Commission's Public Document Room, The Gelman Building, 2120 L Street, NW., Washington, DC, and accessible electronically through the ADAMS Public Electronic Reading Room link at the NRC Web site (http://www.NRC.gov).

Dated at Rockville, Maryland, this 3rd day of November 1999.

FOR THE NUCLEAR REGULATORY COMMISSION

Sheri R. Peterson

Sheri R. Peterson, Chief, Section I
Project Directorate I
Division of Licensing Project Management
Office of Nuclear Reactor Regulation