September 5, 2000

Mr. Ronald DeGregorio
Vice President Oyster Creek
AmerGen Energy Company, LLC
P.O. Box 388
Forked River, NJ 08731

SUBJECT: OYSTER CREEK NUCLEAR GENERATING STATION - ENVIRONMENTAL ASSESSMENT AND FINDING OF NO SIGNIFICANT IMPACT - SPENT FUEL POOL MODIFICATION (TAC NO. MA5965)

Dear Mr. DeGregorio:

Enclosed is a copy of the Environmental Assessment and Finding of No Significant Impact related to your application for amendment dated June 18, 1999, as supplemented on June 22 and December 10, 1999, and February 10, and May 2, 2000. The proposed amendment would revise the Technical Specifications (TSs) to reflect the installation of additional spent fuel pool storage racks. The additional new racks would provide 390 additional spent fuel assembly storage locations.

The assessment is being forwarded to the Office of the Federal Register for publication.

Sincerely,

/RA/

Helen N. Pastis, Senior Project Manager, Section 1
Project Directorate 1
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket No. 50-219

Enclosure: Environmental Assessment

cc w/encl: See next page

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UNITED STATES NUCLEAR REGULATORY COMMISSION

AMERGEN ENERGY COMPANY, LLC

DOCKET NO. 50-219

OYSTER CREEK NUCLEAR GENERATING STATION

ENVIRONMENTAL ASSESSMENT AND FINDING OF NO SIGNIFICANT IMPACT

The U.S. Nuclear Regulatory Commission (NRC) is considering issuance of an amendment to Facility Operating License No. DPR-16, issued to AmerGen Energy Company, LLC, (the licensee), for operation of the Oyster Creek Nuclear Generating Station (Oyster Creek), located in Lacey Township, Ocean County, New Jersey.

ENVIRONMENTAL ASSESSMENT

Identification of the Proposed Action:

The proposed action would revise the Technical Specifications (TSs) to reflect the installation of additional spent fuel pool (SFP) storage racks. The additional new racks would provide 390 additional spent fuel assembly storage locations.

The proposed action is in accordance with the licensee's application for amendment dated June 18, 1999, as supplemented on June 22 and December 10, 1999, and February 10, and May 2, 2000. On the date of the application, GPU Nuclear, Inc. (GPUN) was the licensed operator for Oyster Creek. On August 8, 2000, GPUN's ownership interest in Oyster Creek was transferred to AmerGen Energy Comapny, LLC (AmerGen). By letter dated August 10, 2000, AmerGen requested that the Nuclear Regulatory Commission continue to review and act upon all requests before the Commission, which had been submitted by GPUN.

The Need for the Proposed Action:

The proposed action is needed to provide for storage of spent fuel. The underlying purpose of the expansion is to provide interim additional storage capacity for spent fuel to allow for continued operation of the plant until additional methods of storing spent fuel have been established.

Environmental Impacts of the Proposed Action:

The NRC has completed its evaluation of the proposed action and concludes that there are no significant environmental impacts associated with the proposed action. The factors considered in this determination are discussed below.

Radioactive Wastes

Oyster Creek uses 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 December 1974. 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 are released to the reactor coolant from the small number of fuel assemblies which are expected to develop leaks during reactor operation. During refueling operations, some of these fission products enter the SFP and are subsequently released into the air. Since the frequency of refuelings (and therefore the number of freshly off loaded spent fuel assemblies stored in the SFP at any one time) will not increase, there will be no increase in the amounts of these types of fission products released to the atmosphere as a result of the increased SFP fuel storage capacity.

The increased heat load on the SFP from the storage of additional spent fuel assemblies could potentially result in an increase in the SFP 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 Oyster Creek will remain a small fraction of the limits of 10 CFR 20.1301.

Criticality analyses were performed with several assumptions which tend to maximize the rack reactivity. For example, it was assumed that the racks contain the most reactive fuel authorized to be stored at Oyster Creek without any control rods or any uncontained burnable absorber and with the fuel at the burnup corresponding to the highest planar reactivity during its burnup history. The criticality aspects of the proposed expansion of the spent fuel storage racks are acceptable and meet the requirements of General Design Criterion 62 for the prevention of criticality in fuel storage and handling. Therefore, there is no significant increase in the probability or consequences of accidents which could include the release of radioactive material.

Solid Radioactive Wastes

Spent resins are generated by the processing of SFP water through the SFP purification system at Oyster Creek. These spent resins are disposed of as solid radioactive waste. The water turbulence caused by the SFP reracking may result in some minor amounts of resuspension of particulate matter in the SFP. This could result in a small, temporary increase in the resin change-up frequency of the SFP purification system during the SFP reracking operation. The licensee will use, as necessary, an underwater vacuum to clean the floor of the SFP. Vacuuming of the SFP floor will remove any extraneous debris and crud and ensure visual clarity in the SFP (to facilitate above-pool and diving operations, if necessary). Additional solid radwaste will consist of any interferences that may have to be removed from the SFP to permit installation of the new SFP rack modules. Other than the radwaste generated during the actual new rack installation operation, 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 at the facility.

Liquid Radioactive Wastes

The release of radioactive liquids will not be affected directly as a result of the SFP modifications. The SFP ion exchanger resins remove soluble and particulate 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 change-up may increase only slightly during the installation of the new racks. However, the amount of liquid radioactive material released to the environment as a result of the proposed SFP expansion is expected to be negligible.

Radiological Impact Assessment

Radiation Protection personnel will monitor the doses to the workers during the SFP expansion operation, and all work will be in accordance with radiation work permits. If divers are used for the SFP racking operation, the licensee will provide procedures which will specify required survey, personal dosimetry, and other work controls consistent with the intent of Regulatory Guide 8.38, Appendix A guidance. The total occupational dose to plant workers as a result of the SFP expansion operation is estimated to be between 1 and 2 person-rem. This dose estimate is reasonable, given the limited work scope proposed, and is consistent with comparable doses for similar SFP modifications/operations performed at other plants. The upcoming 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 licensee's proposal, the staff concludes that the Oyster Creek Station SFP rack installation operation can be performed in a manner that will ensure that doses to workers will be maintained ALARA. The estimated collective dose to perform the proposed SFP racking operation is a small fraction of the annual collective dose accrued at the facility.

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, Low Population Zone, and Control Room. The proposed SFP rack installation at Oyster Creek 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 significantly 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 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:

Spent fuel pool expansion was found by the licensee to be the preferred option. An overview of the alternative technologies considered by the licensee is provided below.

Rod Consolidation

Rod consolidation has been shown to be a feasible technology. Rod consolidation involves disassembly of spent fuel, followed by the storage of the fuel rods from two assemblies into the volume of one and the disposal of the fuel assembly skeleton outside of the pool (this is considered a 2:1 compaction ratio). The rods are stored in a stainless steel can that has the outer dimensions of a fuel assembly. The can is stored in the spent fuel racks. The top of the can has an end fixture that matches up with the spent fuel handling tool. This permits moving the cans in an easy fashion.

Rod consolidation pilot projects in the past have consisted of underwater tooling that is manipulated by an overhead crane and operated by a maintenance worker. This is a very slow and repetitive process.

The industry experience with rod consolidation has been mixed thus far. The principal advantages of this technology are the ability to modularize, compatibility with Department of Energy (DOE) waste management system, moderate cost, no need of additional land, and no additional required surveillance. The disadvantages are the release of fission gases from rod breakage, the potential for increased fuel cladding corrosion from scraping of the protective oxide layer, the potential interference of the (prolonged) consolidation activity with ongoing plant operation, the increased dead weight and floor loading, and the lack of sufficient industry experience.

On-Site Cask Storage

Dry cask storage is a method of storing spent nuclear fuel in a high capacity container. The cask provides radiation shielding and passive heat dissipation. Typical capacities for boiling-water reactor fuel range from 44 to 68 assemblies that have been removed from the reactor for at least 5 years. The casks, once loaded, are then stored outdoors on a seismically qualified concrete pad. The pad will have to be located away from the secured boundary of the site because of site limitations. The storage location will be required to have a high level of security that includes frequent tours, reliable lighting, intruder detection, and continuous visual monitoring.

The casks, as presently licensed, are limited to 20-year storage service life. Once the 20 years has expired the cask manufacturer or the utility must recertify the cask or the utility must remove the spent fuel from the container. In the interim, the U.S. DOE has embraced the concept of multi-purpose canister (MPC), obsolescing all existing licensed cask designs. Work is also continuing by several companies to provide an MPC system that will be capable of long-term storage, transport, and final disposal in a repository. For example, the plant must provide for a decontamination facility where the outgoing cask can be decontaminated for release. There are several plant modifications required to support cask use. Tap-ins must be made to the gaseous waste system and chilled water to support vacuum drying of the spent fuel and piping must be installed to return cask water back to the spent fuel pool/cask pit. A seismic concrete pad must be made to store the loaded casks. This pad must have a security fence, surveillance protection, emergency power, and video surveillance. Finally, facilities must be provided to vacuum dry the cask, back fill it with helium, perform leak checks, remachine the gasket surfaces if leaks persist, and assemble the cask on-site. Presently, no MPC cask had been licensed. Because of the continued uncertainty in the government’s policy, the licensee stated that the capital investment to use a dry storage system is considered to be an inferior alternative for Oyster Creek at this time.

Modular Vault Dry Storage

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 radiation shielding and missel protection. It must be designed to withstand the postulated seismic loadings for the site.

A transfer cask is needed to deliver the storage canisters from the fuel pool. The plant must provide for a decontamination bay to decontaminate the transfer cask and connection to its gaseous waste system and chilled water systems. A collection and delivery system must be installed to return the pool water entrained in the canisters back to the fuel pool. Provisions for canister drying, helium injection, handling and automatic welding are also necessary.

The storage area must be designed to have a high level of security. Due to the required space, the vault secured area must be located outside the secured perimeter. Consideration of safety and security requires it to have its own video surveillance system, intrusion detection, and an autonomous power source.

Some other concerns relating to the vault storage system are the inevitable "repackaging" for shipment to the DOE repository, the responsibility to eventually decommission the new facility, the large "footprint" (land consumption), the potential fuel handling accidents, the potential fuel/clad rupture due to high temperatures, and the high cost.

At the present time, no MPC technology based vault system has been licensed for fuel transport. The high cost and uncertainty make this option less prudent.

Horizontal Silo Storage

A variation of the horizontal vault storage technology is more aptly referred to as "horizontal silo" storage. This technology suffers from the same drawbacks that other dry cask technologies have, namely:

a. No fuel with cladding defects can be placed in the silo.

b. Concern regarding long-term integrity of the fuel at elevated temperatures.

c. Potential for eventual repackaging at the site.

d. Potential for fuel handling accidents.

e. Relatively high cumulative dose to personnel in effecting fuel transfer (compared to reracking).

f. Compatibility of reactor/fuel building handling crane with fuel transfer hardware.

g. Potential incompatibility with DOE shipment for eventual off-site shipment.

h. Potential for sabotage.

New Fuel Pool

Constructing and licensing a new fuel pool is not a practical alternative for Oyster Creek because such an effort may take up to 10 years. Moreover, the cost of this option is prohibitively high.

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

Shipment of 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. In October 1996, the Administration did commit DOE to begin storing wastes at a centralized location by January 31, 1998. However, 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 spent fuel to the DOE repository is not considered an alternative to increased onsite spent fuel storage capacity at this time.

Shipment of Fuel to a Reprocessing Facility

Reprocessing of spent fuel from Oyster Creek 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. The shipment of spent fuel to a reprocessing facility is not an acceptable alternative because of increased fuel handling risks and additional occupational exposure.

Shipment of Fuel to Another Utility or Site for Storage

The shipment of fuel to another utility for storage would provide short-term relief from the storage problem at Oyster Creek. The Nuclear Waste Policy Act and 10 CFR Part 53, however, clearly place the responsibility for the interim storage of spent fuel with each owner or operator of a nuclear plant. The shipment of fuel to another source is not an acceptable alternative because of increased fuel handling risks and additional occupational radiation exposure, as well as the fact that no additional storage capacity would be created.

Reduction of Spent Fuel Generation

Operation at a reduced power level would decrease the amount of fuel being stored in the pool and thus increase the amount of time before full core off-load capacity is lost. However, operating the plant at a reduced power level would not make effective use of available resources. Therefore, reducing the amount of spent fuel generated by reducing power is not considered a practical alternative.

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 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 Oyster Creek.

Agencies and Persons Consulted:

In accordance with its stated policy, on July 17, 2000, the NRC staff consulted with the New Jersey State official, Mr. Richard Pinney, of the State of New Jersey Department of Environmental Protection, 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 letter dated June 18, 1999, as supplemented on June 22 and December 10, 1999, and February 10, and May 2, 2000, which are available for public inspection at the Commission's Public Document Room, The 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 5th day of September, 2000.

FOR THE NUCLEAR REGULATORY COMMISSION

/RA/

Helen N. Pastis, Senior Project Manager, Section 1
Project Directorate I
Division of Licensing Project Management
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