October 4, 1989

Docket No. 50-286

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Mr. John C. Brons
Executive Vice President - Nuclear Generation
Power Authority of the State of New York
123 Main Street
White Plains, New York 10601

Dear Mr. Brons:

SUBJECT: ENVIRONMENTAL ASSESSMENT AND FINDING OF NO SIGNIFICANT IMPACT - SPENT FUEL EXPANSION, INDIAN POINT NUCLEAR GENERATING UNIT NO. 3 (TAC NO. 68233)

By letter dated May 9, 1988, the Power Authority of the State of New York (the licensee) requested a license amendment to change the Technical Specifications related to the proposed spent fuel pool expansion at Indian Point 3. Additional information was provided by letters dated June 9, 1988, December 20, 1988, May 26, 1989 and September 15, 1989.

Enclosed is our Environmental Assessment related to this proposed action. Based on our assessment, we have concluded that there are no significant radiological or nonradiological impacts associated with the proposed spent fuel pool expansion and it will have no significant impact on the quality of the human environment.

We have also enclosed a Notice of Issuance of Environmental Assessment and Finding of No Significant Impact. This Notice is being forwarded to the Office of Federal Register for publication.

Sincerely,

Original signed by

Joseph D. Neighbors, Senior Project Manager
Project Directorate I-1
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Enclosures:
1. Environmental Assessment
2. Notice of Issuance of Environmental Assessment

cc w/enclosures:
See next page

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UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

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Executive Vice President - Nuclear Generation
Power Authority of the State of New York
123 Main Street
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See next page

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of New York

Indian Point 3 Nuclear Power Plant

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UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

ENVIRONMENTAL ASSESSMENT

BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATING TO THE EXPANSION OF THE SPENT FUEL POOL

FACILITY OPERATING LICENSE NO. DPR-64

POWER AUTHORITY OF THE STATE OF NEW YORK

INDIAN POINT NUCLEAR GENERATING UNIT NO. 3

DOCKET NO. 50-286

1.0 INTRODUCTION

1.1 Description of Proposed Action

By letter dated May 9, 1988, the Power Authority of the State of New York (the licensee) requested an amendment to Facility Operating License No. DPR-64 for the Indian Point Nuclear Generating Unit No. 3 (IP-3) to allow the expansion of the capacity of the spent fuel pool. Further information was provided by letters dated June 9, 1988, December 20, 1988, May 26, 1989 and September 15, 1989.

The amendment would specifically authorize the licensee to increase the capacity of the spent fuel pool from the currently approved capacity of 840 fuel assemblies to the proposed capacity of 1345 fuel assemblies. The proposed expansion would be achieved by removing the current spent fuel racks from the pool and replacing them with new racks (i.e., reracking), in which the cells for the spent fuel assemblies are more closely spaced.

The existing high density storage racks are arranged in twelve modules. In seven of the twelve existing modules, the center-to center spacing of the fuel cells is 12 inches in either direction; in five of the twelve modules, the center-to center spacing of the fuel cells is 12 inches in one direction and 11.25 inches in the other direction. The existing storage cells are formed from a type 304 stainless steel sheet of 0.150 inch minimum thickness with borated stainless steel plates welded to the cell at specified locations.

The proposed replacement storage rack design is a free-standing welded honeycomb array of stainless steel boxes which has no grid frame structure. The storage racks are arranged and categorized in two regions based on fuel assembly enrichment and burnup. The nominal pitch for Region I storage cells is 10.76 inches. The nominal pitch for Region 2 storage cells is 9.075 inches. All storage cells are bounded on four sides by boral poison sheets, except on the periphery of the pool rack array.

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The maximum density storage racks are designed for a fuel enrichment of up to 4.5 w/o U-235, which is slightly higher than the currently allowable maximum of 4.3 w/o U-235. This application also seeks to increase the maximum fuel enrichment allowed in the spent fuel pool and the reactor core from 4.3 w/o to 4.5 w/o U-235.

1.2 Need for Increased Storage Capacity

a. The licensee currently has no contractual arrangements with any fuel reprocessing facility. There are no operating or planned fuel reprocessing facilities available in the U.S.

   The licensee has executed contracts with the U.S. Department of Energy (DOE) pursuant to the Nuclear Waste Policy Act of 1982. However, the disposal facilities are not expected to be available for spent fuel any earlier than 1998, if a monitored retrievable storage (MRS) facility is constructed, or 2003 for construction of a permanent repository.

b. The licensee's projected refueling schedule for Indian Point 3 and the expected number of fuel assemblies that will be transferred into spent fuel pool at each refueling results in the loss of ability to maintain a full core reserve in 1994. At present the licensed capacity is 840 storage cells. All calculations for loss of full core reserve (FCR) are based on the number of licensed total cells in the pool and assumes the installation of 1345 replacement cells which lengthens the time of loss of FCR to the year 2005.

c. The Indian Point 3 spent fuel pool is expected to contain 368 to 444 fuel assemblies at the time of reracking. It is best to minimize the inventory of spent fuel in the pool at the time of reracking in order to minimize fuel handling and radiation exposure.

d. Adoption of this proposed spent fuel storage expansion would not necessarily extend the time period that spent fuel assemblies would be stored on site. Spent fuel will be removed from the site for disposal under the provisions of the Nuclear Waste Policy Act of 1982, but a government facility is not expected to be available to accept full reload quantities of spent fuel from Indian Point 3 before 2003.

1.3 Alternatives

Commercial reprocessing of spent fuel has not developed as originally anticipated. In 1975, the Nuclear Regulatory Commission directed its staff to prepare a Generic Environmental Impact Statement (GEIS) on spent fuel storage. The Commission directed the staff to analyze alternatives for the handling and storage of spent light water power reactor fuel with particular emphasis on developing long-range policy. The GEIS was to consider alternative methods of spent fuel storage, as well as the possible restriction or termination of the generation of spent fuel through nuclear power plant shutdown.

A "Final Generic Environmental Impact Statement on Handling and Storage of Spent Light Water Power Reactor Fuel" (NUREG-0575), Volumes 1-3 (the FGEIS) was issued by the NRC in August 1979. The finding of the FGEIS is that the environmental impact costs of interim storage are essentially negligible, regardless of where such spent fuel is stored. A comparison of the impact costs of various alternatives reflects the advantage of continued generation of nuclear power versus its replacement by coal-fired power generation. Continued nuclear generation of power versus its replacement by oil-fired generation provides an even greater economic advantage. In the bounding case considered in the FGEIS, that of shutting down the reactor when the existing spent fuel storage capacity is filled, the cost of replacing nuclear stations before the end of their normal lifetime makes this alternative uneconomical. The storage of spent fuel as evaluated in NUREG-0575 is considered to be an interim action, not a final solution to permanent disposal.

One spent fuel storage alternative considered in detail in the FGEIS is the expansion of the onsite fuel storage capacity by modification of the existing spent fuel pools. Applications for more than 100 spent fuel pool expansions have been received and have been approved or are under review by the NRC. The finding in each case has been that the environmental impact of such increased storage capacity is negligible. However, since there are variations in storage design and limitations caused by the spent fuel already stored in some of the pools, the FGEIS recommends that licensing reviews be done on a case-by-case basis to resolve plant-specific concerns.

The continuing validity and site specific applicability of the conclusions in the NUREG-0575 have been confirmed in the Environmental Assessments for the Surry and H.B. Robinson Plants' independent spent fuel storage installations.

The licensee has considered several alternatives to the proposed action of the spent fuel pool expansion. The staff has evaluated these and certain other alternatives with respect to the need for the proposed action as discussed in Section 1.2 of this assessment. The following alternatives were considered:

(1) Shipment of spent fuel to a permanent federal fuel storage/disposal facility.

(2) Shipment of fuel to a reprocessing facility.

(3) Shipment of fuel to another utility or site for storage.

(4) Reduction of spent fuel generation.

(5) Construction of a new independent spent fuel storage installation (ISFSI).

(6) No action taken.

Each of these alternatives is discussed below.

1. Shipment of Spent Fuel to a Permanent Federal Fuel Storage/Disposal Facility

Shipment to a permanent federal fuel storage disposal facility is a preferred alternative to increasing the onsite spent fuel storage capacity. The licensee has made contractual arrangements whereby spent nuclear fuel and/or high level nuclear waste will be accepted and disposed of by the U.S. Department of Energy (DOE). DOE is developing a repository under the Nuclear Waste Policy Act of 1982 (NWPA). However, the facility is not likely to be ready to receive spent fuel until the year 2003, at the earliest.

As an interim measure, shipment to a Monitored Retrievable Storage (MRS) facility is another preferred alternative to increasing the onsite spent fuel storage capacity. DOE, under the NWPA, has recently submitted its MRS proposal to Congress. Because Congress has not authorized an MRS and because one is not projected to be available until 1998, this alternative does not meet the near-term storage needs of IP-3.

Under the NWPA, the federal government has the responsibility to provide not more than 1900 metric tons capacity for the interim storage of spent fuel. The impacts of storing fuel at a Federal Interim Storage (FIS) facility fall within those already assessed by the NRC in NUREG-0575. In enacting NWPA, Congress found that the owners and operators of nuclear power stations have the primary responsibility for providing interim storage of spent nuclear fuel. In accordance with the NWPA and 10 CFR Part 53, shipping of spent fuel to a FIS facility is considered a last resort alternative. At this time, the licensee cannot take advantage of FIS because existing storage capacity is not maximized. Therefore, the licensee has been diligently pursuing this application for the spent fuel pool expansion at this time. The alternative of shipment of spent fuel to a FIS is not available.

2. Shipment of Fuel to a Reprocessing Facility

Reprocessing of spent fuel from IP-3 is not viable because presently there is no operating commercial reprocessing facility in the United States, nor is there the prospect for one in the foreseeable future.

3. Shipment of Fuel to Another Utility or site For Storage

The shipment of spent fuel from IP-3 to the storage facility of another utility company could provide short-term relief for the storage capacity problem. However, the NWPA and 10 CFR Part 53 clearly place the responsibility for the interim storage of spent nuclear fuel with each owner or operator of a nuclear power plant. Moreover, transshipment of spent fuel to and its storage at another site would entail potential environmental impacts greater than those associated with the proposed increased storage at the IP-3 site. Therefore, this is not considered a practical or reasonable alternative.

The licensee does not own or control any facility where it could transfer spent fuel from IP-3. The James A. FitzPatrick Nuclear Power Plant, owned by the licensee, is a Boiling Water Reactor (BWR) with BWR spent fuel racks that could not accept Pressurized Water Reactor (PWR) fuel from IP-3.

4. Reduction of Spent Fuel Generation

Improved usage of fuel in the reactor and/or operation at a reduced power level would extend the life of the fuel in the reactor. In the case of extended burnup of fuel assemblies, the fuel cycle would be extended and fewer offloads would take place. However, the current storage capacity would still be exhausted as discussed in Section 1.2. Operation at reduced power would not make effective use of available resources and would thus result in economic penalties.

5. Construction of A New Independent Spent Fuel Storage Installation

Additional storage capacity could be developed by building a new, independent spent fuel storage installation (ISFSI), similar either to the existing pool or a dry cask storage installation. The NRC staff has generically assessed the impacts of the pool alternative and found, as reported in NUREG-0575, that "the storage of LWR spent fuels in water pools has an insignificant impact on the environment." A generic assessment for the dry cask alternative has not been made by the staff. However, assessments for the dry cask ISFSI at the Surry Power Station and the dry modular concrete ISFSI at the H.B. Robinson Steam Electric Plant Unit 2 resulted in Findings of No Significant Impact. While these alternatives are environmentally acceptable, such a new storage facility, either at the IP-3 or at a location offsite, would require new site-specific design and construction, including equipment for the transfer of spent fuel. NRC review, evaluation and licensing of such a facility would also be required. It is not likely that this entire effort would be completed in time to meet the need for additional capacity as discussed in Section 1.2. Furthermore, such construction would not utilize the existing expansion capabilities of the existing pool and thus would waste resources.

6. No Action Taken

If no action were taken, i.e., the spent fuel pool storage capacity remains at 840 locations, the storage capacity would become exhausted in 1994 and IP-3 would have to be shut down. Such termination of operations would result in no further generation of spent fuel, thereby eliminating the need for increased spent fuel storage capacity. The impacts of terminating the generation of spent fuel by ceasing the operation of existing nuclear power plants (i.e., ceasing generation of electric power) when their spent fuel pools become filled was evaluated in NUREG-0575 and found to be undesirable. This alternative would be a waste of an available resource, and is not considered viable.

In summary, the only long-term alternative that could provide an alternative solution to the licensee's spent fuel storage capacity problem is the construction of a new independent spent fuel storage installation at IP-3 site or at a location away from the site. Construction of such an additional spent fuel storage facility could provide long-term increased storage capacity for IP-3. However, this alternative would have to be designed by the licensee and reviewed by the NRC and may not be implemented in a timely manner to meet the need for additional capacity for IP-3.

1.4 Fuel Reprocessing History

Currently, spent fuel is not being reprocessed on a commercial basis in the United States. The Nuclear Fuel Services (NFS) plant at West Valley, New York, was shut down in 1972 for alterations and expansion. In September 1976, NFS informed the Commission that it was withdrawing from the nuclear fuel reprocessing business. The Allied General Nuclear Services (AGNS) proposed plant in Barnwell, South Carolina, is not licensed to operate. The General Electric Company (GE) Morris Operation (formerly Midwest Recovery Plant) in Morris, Illinois, is in a decommissioned condition.

On April 17, 1977, President Carter issued a policy statement on commercial reprocessing of spent nuclear fuel, which effectively eliminated reprocessing as part of the relatively near-term nuclear fuel cycle.

Although no plants are licensed for reprocessing fuel, the storage pools at Morris and at West Valley are licensed to store spent fuel. The storage pool at West Valley is not full, but the licensee (the current licensee is New York Energy Research and Development Authority) is presently not accepting any additional spent fuel for storage, even from those power generating facilities that had contractual arrangements with West Valley. (In fact, spent fuel is being removed from NFS and returned to its owners.) On May 4, 1982, the license held by GE for spent fuel storage activities at its Morris operation was renewed for another 20 years; however, GE is committed to accept only limited quantities of additional spent fuel for storage at this facility from Cooper and San Onofre Unit 1.

2.0 RADIOACTIVE WASTES

Indian Point 3 contains radioactive waste treatment systems designed to collect and process the gaseous, liquid, and solid waste that might contain radioactive material. The radioactive waste treatment systems are evaluated in the Final Environmental Statement (FES). There will be no change in the waste treatment systems described in the FES because of the proposed spent fuel pool (SFP) rerack.

2.1 Radioactive Material Released To The Atmosphere

The station Radiological Effluent Technical Specifications limit the total releases of gaseous activity and require that releases be continuously monitored to assure that releases are within the regulatory limits of 10 CFR Part 20.

With respect to releases of gaseous materials to the atmosphere, the only radioactive gas of significance which could be attributable to storing additional spent fuel assemblies for a longer period of time would be the noble gas radionuclide Krypton-85 (Kr-85). To determine the average annual release of Kr-85, we assume that all of the Kr-85 released from any defective fuel discharged to the SFP will be released prior to the next refueling. Thus, enlarging the storage capacity of the SFP has no effect on the calculated average annual quantities of KR-85 released to the atmosphere each

year. There may be some small change in the calculated quantities due to a change in the fuel burnup; this is expected to be a small fraction of the calculated annual quantities (also see Section 5.0, below).

Iodine-131 (I-131) releases from spent fuel assemblies to the SFP water will not be significantly increased because of the expansion of the fuel storage capacity since the Iodine-131 inventory in the fuel will decay to negligible levels between refuelings.

Most of the tritium in the SFP water results from activation of boron and lithium in the primary coolant. Thus, the tritium concentration from this source will not be affected by the proposed changes. A relatively small amount of tritium is created during reactor operation by fissioning of reactor fuel and subsequent diffusion of tritium thorough the fuel and fuel cladding. Tritium release from the fuel essentially occurs while the fuel is hot, that is, during operations and, to a limited extent, shortly after shutdown. Thus, expanding the SFP capacity will not significantly increase the tritium activity in the SFP.

2.2 Solid Radioactive Wastes

The concentration of radionuclides in the pool water is controlled by the SFP cleanup system and by decay of short-lived radionuclides. The activity is highest during refueling operations when reactor coolant water is introduced into the pool, and decreases as the pool water is processed through the SFP cleanup system. The increase of radioactivity, if any, due to the proposed modification, should be minor because of the capability of the cleanup system to continuously remove radioactivity from the SFP water and lower radioactivity to acceptable levels.

We do not expect any significant increase in the amount of solid waste generated from the SFP cleanup systems due to the proposed modification. The expected increase in total waste volume shipped from IP-3 is less than 1 percent and would not have any significant additional environmental impact.

The spent fuel storage rack modules that will be removed from the spent fuel pool weigh up to 34,000 pounds each. The total weight of these racks is approximately 176 tons. They will be cleaned of loose contamination, packaged and shipped to a licensed radioactive waste processing facility. At the waste processing facility, the racks will be decontaminated to the maximum extent possible. Remaining portions of the racks and contaminated waste generated from decontamination will be buried at a licensed radioactive waste burial site. In preparing non-decontaminatable waste for shipment and subsequent burial, volume reduction methodologies will be employed such as compaction, combining metallic materials with "soft waste" to minimize void space, and super compaction where feasible.

If the present spent fuel racks to be removed from the SFP of IP-3 are contaminated because of the proposed modification, they may be disposed of as low level solid waste. Averaged over the lifetime of the station, this would increase the total waste volume shipped from the station by less than 1 percent. This will not have any significant additional environmental impact.

2.3 Radioactive Material Released To Receiving Waters

There should not be a significant increase in the liquid release of radionuclides from the plant as a result of the proposed modifications.

Since the SFP cooling and cleanup systems operate as a closed system, only water originating from cleanup of SFP floors and resin sluice water need be considered as potential sources of radioactivity. It is expected that neither the flow rate nor the radionuclide concentration of the floor cleanup water will change as a result of these modifications.

The SFP demineralizer resin removes soluble radioactive materials from the SFP water. These resins are periodically sluiced with water to the spent resin storage tank. The amount of radioactivity on the SFP demineralizer resin may increase slightly due to the additional spent fuel in the pool, but the soluble radioactive material should be retained on the resins. Radioactive material that might be transferred from the spent resin to the sluice water will be effectively removed by the liquid radwaste system. After processing in the liquid radwaste system, the amount of radioactivity released to the environment as a result of the proposed modification would be negligible.

3.0 RADIOLOGICAL IMPACT ASSESSMENT

This section contains the staff's estimates of the impacts on the public from the proposed SFP modification. The section also contains the staff's evaluation of the estimates of the additional radiological impacts on the plant workers from the proposed operation of the modified SFP.

3.1 Public Radiation Exposure

Sections 2.1 and 2.3 indicated that releases to the atmosphere and receiving waters, respectively, would not be significant and would be well within regulatory limits. Consequently, the estimated increase in doses due to exposure of individuals and the population to radioactive materials associated with the spent fuel pool modification will not be significant, i.e., also, well within regulatory limits.

3.2 Occupational Exposure

This section contains the staff's evaluation of the estimates of the additional radiological impacts on the plant workers from the proposed operation of the modified SFP.

The occupational exposure for the proposed modification of the SFP is estimated by the licensee to be less than 10 to 15 person-rems. This dose is less than 5 percent of the average annual occupational dose of 336 person-rems per unit per year for operating PWRs in the United States in 1988. The small increase in radiation dose should not affect the licensee's ability to maintain individual occupational doses with the limits of 10 CFR 20, and as low as is reasonably achievable. Normal radiation control procedures (NUREG-0800, US NRC 1981) and Regulatory Guide 8.8 (US NRC 1978) should preclude any significant occupational radiation exposures.

Based on present and projected operations in the SFP area, we estimate that the proposed operation of the modified SFP should add only a small fraction to the total annual occupational radiation dose at this facility.

Thus, we conclude that the proposed storage of spent fuel in the modified SFP will not result in any significant increase in doses received by workers.

3.3 Conclusions

Based on its review of the proposed expansion of the SFP at IP-3, the staff concludes that:

1. The estimated additional radiation doses to the general public are:

    a. Much less than those incurred during normal operation of the Indian Point 3.

    b. Very small in comparison to the dose members of the public receive each year from exposure to natural background radiation.

2. The licensee has taken appropriate steps to ensure that occupational dose will be maintained as low as is reasonably achievable (ALARA) and within the limits of 10 CFR Part 20. The total occupational dose estimated to be associated with the proposed modification of the expanded fuel pool is approximately 10 to 15 person-rems, which is a small fraction of the average annual total occupational dose at Indian Point Unit 3.

On the basis of the foregoing evaluation, it is concluded that there would be no significant additional environmental radiological impact attributable to the proposed reracking and modification to increase the spent fuel storage capacity at Indian Point 3.

We have concluded, based on the considerations discussed above, that there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, with regard to radiation doses to the public and plant workers.

4.0 NON-RADIOLOGICAL IMPACT

The only non-radiological effluent affected by the spent fuel pool expansion is the additional waste heat rejected from the plant. The total increase in heat load rejected to the environment through the cooling systems due to the increased spent fuel storage over the current rejected heat load is 1.64×10^6 BTU/hour. This represents an increase of approximately 0.03 percent of the total heat rejected to the environment. Thus, the increase in rejected heat will have negligible impact on the environment. No impact on aquatic biota is anticipated.

The licensee has not proposed any change in the use or discharge of chemicals in conjunction with the expansion of the fuel pool. The proposed fuel pool expansion will not require any change to the NPDES permit.

Therefore, the staff concludes that the non-radiological environmental impacts of expanding the spent fuel pool will be insignificant.

5.0 ACCIDENT CONSIDERATIONS

The staff, in its related Safety Evaluation to be published at a later date, has addressed both the safety and environmental aspects of a fuel handling accident, an event that bounds the potential adverse consequences of an accident attributable to operation of a spent fuel pool with high density racks. A fuel handling accident may be viewed as a "reasonably foreseeable" design basis event which the pool and its associated structures, systems, and components (including the racks) are designed and constructed to prevent. The environmental impacts of the accident were found not be significant.

The staff has considered accidents whose consequences might exceed a fuel handling accident, that is beyond design basis events. An accident investigated by the NRC involves a structural failure of SFP resulting in loss of all contained cooling water, followed by fuel heatup and a Zircaloy cladding fire. The details of this severe accident are discussed in NUREG/CR-4982, entitled "Severe Accidents in Spent Fuel Pools in Support of Generic Issue 82." Subsequently, the staff issued NUREG/CR-5176, entitled "Seismic Failure and Cask Drop Analysis of the Spent Fuel Pools at Two Representative Nuclear Power Plants." This report considers the structural integrity of the SFP and the pool response to the circumstances considered. More recently the staff issued NUREG/CR-5281, "Value/Impact Analyses of Accident Preventive and Mitigative Options for Spent Fuel Pools" and NUREG-1353, "Regulatory Analysis for the Resolution of Generic Issue 82: Beyond Design Basis Accidents in Spent Fuel Pools." In NUREG-1353, the staff concluded, on the bases of the information presented and analyzed in the other three documents in the series, that Generic Issue 82 concerning the possibility of Zircaloy cladding fires in spent fuel pools was resolved and required no further study.

The staff believes that the probability of such an accident occurring at Indian Point 3 is extremely low. This belief is based upon the Commission's requirements for the design and construction of spent fuel pools and their contents (e.g., racks), and adherence to approved industry codes and standards. For example, in the Indian Point Unit 3 case, foundation mat and walls are comprised of reinforced concrete. The spent fuel storage racks are Seismic Category I and thus are required to remain functional during and after a safe shutdown earthquake. The cooling water system is extremely reliable; in the highly unlikely event of a total cooling system failure, makeup water sources are available. These are but a few of the considerations used by the staff in assessing the adequacy of the rerack.

The staff acknowledges that if the severe accidents occurred as described above, the environmental impacts could be significant; however, these events are highly unlikely and are not reasonably foreseeable, in light of the design of the spent fuel pool system and racks. Therefore, further discussion of severe accidents is not warranted, and the staff concludes that an Environmental Impact Statement need not be prepared.

5.1 CONSIDERATIONS RELATED TO OTHER POSTULATED ACCIDENTS

No onsite fuel handling accidents having significant offsite radiological consequence have ever occurred. Such accidents and their potential environmental consequences must be postulated. Potential environmental consequences of postulated accidents may be bounded realistically by extrapolation of results from conservative estimates. Offsite doses are estimated conservatively in NRC staff safety reviews for plant siting, design and operations evaluations. The combination of assumptions used for the conservative dose estimates assure that doses for such design basis accidents (DBAs) are unrealistically high. This helps to assure safe plant siting, design and operations because the doses so calculated would exceed regulatory limits without the adoption of plant safety features and/or operational controls. The principal regulatory dose limits for safety reviews are embodied in the NRC Regulations at 10 CFR Part 100. For safety reviews, the limiting dose is 300 rems to the thyroid, principally due to inhalation of I-131 postulated to be accidentally released to the atmosphere.

Several bounding accident analyses for this current assessment have been reported previously (NUREG-0712), and the potential consequences have been found acceptable by the NRC staff. The only pertinent credible accident that has not been analyzed for this assessment is the postulated damage of fuel being handled during the reracking period, with a concomitant release of radioactivity to the atmosphere. A postulated design basis fuel handling accident has been analyzed previously in the Safety Evaluation Report, and a thyroid dose of 67 rems for a person at the site boundary was conservatively estimated. For purposes here, it is significant that this very conservative estimate was based on postulated damage to fuel which had decayed for only three days. In the present case, however, irradiated fuel will have decayed a minimum of 60 days (this will be assured by licensee-imposed administrative controls). I-131 has a half-life of about eight days. During the additional 60 days, I-131 will decay by an additional factor of about 175. The postulated dose will decrease proportionately.

Thus, regardless of the accident probability, which experience says is very low, the offsite thyroid dose due to this bounding postulated accident can be conservatively estimated as 67/175 = 0.4 rem. This dose would be well below the U.S. Environmental Protection Agency Protective Action Guide of 5 rems (thyroid), for which offsite protective action would be warranted. Thus, based on this bounding analysis, the potential environmental consequences of possible accidents are acceptably low, as are the risks.

6.0 SUMMARY

The Final Generic Environmental Impact Statement (FGEIS) on Handling and Storage of Spent Light Water Power Reactor Fuel concluded that the cost of the various alternatives reflects the advantage of continued generation of nuclear power with the accompanying spent fuel storage. Because of the differences in SFP designs, the FGEIS recommended environmental evaluation of SFP expansions on a case-by-case basis.

For Indian Point 3, the expansion of the storage capacity of the spent fuel pool will not create any significant additional radiological effects or measurable non-radiological environmental impacts. The additional whole body dose that might be received by an individual at the site boundary is well within regulatory limits and is not significant. The occupational radiation dose for the proposed operation of the expanded spent fuel pool is estimated by the staff to be less than five percent of the total annual occupational radiation exposure for a facility of this type. The small increase in radiation dose should not affect the licensee's ability to maintain individual occupational dose at Indian Point 3 within the limits of 10 CFR Part 20, and as low as is reasonably achievable.

The only non-radiological effluent affected by the SFP expansion is the additional waste heat rejected. The increase in total plant waste heat is insignificant. Thus, there is no significant environmental impact attributable to the waste heat from the plant due to the SFP expansion.

6.1 Alternative Use of Resources

This action does not involve the use of resources not previously considered in connection with the Nuclear Regulatory Commission's Final Environmental Statement, dated February 3, 1975.

6.2 Agencies and Persons Consulted

The NRC staff reviewed the licensee's request. No other agencies or persons were consulted.

7.0 BASIS AND CONCLUSIONS FOR NOT PREPARING AN ENVIRONMENTAL IMPACT STATEMENT

The staff has reviewed the proposed spent fuel pool modification to Indian Point 3 relative to the requirements set forth in 10 CFR Part 51. Based upon the environmental assessment, the staff has concluded that there are no significant radiological or non-radiological impacts associated with the proposed action and that the proposed license amendment will not have significant effect on the quality of the human environment. Therefore, the Commission has determined, pursuant to 10 CFR 51.31, not to prepare an environmental impact statement for the proposed amendment.

8.0 REFERENCES

U.S. Environmental Protection Agency, 1972, ORP-SID-72-1, "Natural Radiation Exposure in the United States," June 1972.

U.S. Nuclear Regulatory Commission, 1973, "Final Environmental Statement Related to Indian Point Nuclear Generating Plant Unit No. 3, February 1975. (NUREG-75/002/003).

USNRC, 1977, Regulatory Guide 1.109, Revision 1, "Calculation of Annual Doses to Man from Routine Releases of Reactor Effluents for the Purpose of Evaluating Compliance with 10 CFR Part 50, Appendix I," October 1977.

8.0 REFERENCES (CONT'D)

USNRC, 1978, Regulatory Guide 8.8, Revision 3, "Information Relevant to Ensuring That Occupational Radiation Exposures at Nuclear Power Stations Will Be as Low as Is Reasonably Achievable," June 1978.

USNRC, 1981, NUREG-0800, "Radiation Protection," in: "Standard Review Plan," Chapter 12, July 1981 (formerly issued as NUREG-75/087).

USNRC, 1985, NUREG-0713, Volume 7, "Occupational Radiation Exposure at Commercial Nuclear Power Reactors 1985," April 1988.

USNRC, NUREG/CR-4982, "Severe Accidents in Spent Fuel Pools in Support of Generic Issue 82," July 1987.

USNRC, NUREG/CR-5176, "Seismic Failure and Cask Drop Analyses of the Spent Fuel Pools at Two Representative Nuclear Power Plants," January 1989.

USNRC, NUREG/CR-5281, "Value/Impact Analyses of Accident Preventive and Mitigative Options for Spent Fuel Pools," March 1989.

USNRC, NUREG/CR-1353, "Regulatory Analysis for the Resolution of Generic Issue 82: Beyond Design Basis Accidents in Spent Fuel Pools," April 1989.

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UNITED STATES NUCLEAR REGULATORY COMMISSION

POWER AUTHORITY OF THE STATE OF NEW YORK

DOCKET NO. 50-286

NOTICE OF ISSUANCE OF ENVIRONMENTAL ASSESSMENT AND

FINDING OF NO SIGNIFICANT IMPACT

The U. S. Nuclear Regulatory Commission (the Commission) is considering issuance of amendment to Facility Operating License No. DPR-64, issued to the Power Authority of the State of New York (the licensee), for operation of the Indian Point 3 Nuclear Generating Unit No. 3 in Westchester County, New York.

Identification of Proposed Action:

The amendment would consist of changes to the Technical Specifications (TS) and would authorize an increase of the storage capacity of the spent fuel pool from 840 fuel assemblies to 1345 fuel assemblies.

The amendment to the TS is responsive to the licensee's application dated May 9, 1988, as supplemented June 9, 1988, December 20, 1988, May 26, 1989 and September 15, 1989. The Commission's staff has prepared an Environmental Assessment of the Proposed Action, "Environmental Assessment by the Office of Nuclear Reactor Regulation Relating to the Expansion of the Spent Fuel Pool, Facility Operating License No. DPR-64, Power Authority of the State of New York, Docket No. 50-286 dated September 15, 1989.

Summary of Environmental Assessment:

The "Final Generic Environmental Impact Statement (FGEIS) on Handling and Storage of Spent Light Water Power Reactor Fuel" (NUREG-0575), Volumes 1-3, concluded that the environmental impact of interim storage of spent fuel was negligible and the cost of the various alternatives reflects the advantage of

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continued generation of nuclear power with the accompanying spent fuel storage. Because of the differences in design, the FGEIS recommended evaluating spent fuel pool expansions on a case-by-case basis.

For Indian Point Nuclear Generating Unit No. 3, the expansion of the storage capacity of the spent fuel pool will not create any significant additional radiological effects on non-radiological environmental impacts.

The additional whole body dose that might be received by an individual at the site boundary is well within regulatory limits and is not significant. The occupational radiation dose for the proposed operation of the expanded spent fuel pool is estimated to be less than five percent of the total annual occupational radiation exposure for this facility.

The only non-radiological impact affected by the spent fuel pool expansion is the waste heat rejected. The increase in total plant waste heat is insignificant. There is no significant environmental impact attributed to the waste heat from the plant due to the spent fuel pool expansion.

FINDING OF NO SIGNIFICANT IMPACT

The staff has reviewed the proposed spent fuel pool expansion to the facility relative to the requirements set forth in 10 CFR Part 51. Based on this assessment, the staff concludes that there are no significant radiological or non-radiological impacts associated with the proposed action and that the issuance of the proposed amendment to the license will have no significant impact on the quality of the human environment. Therefore, pursuant to 10 CFR 51.31, no environmental impact statement needs to be prepared for this action.

For further details with respect to this action, see (1) the application for amendment to the Technical Specifications dated May 9, 1988, as supplemented June 9, 1988, December 20, 1988, May 26, 1989 and September 15, 1989, (2) the

FGEIS on Handling and Storage of Spent Light Water Power Reactor Fuel (NUREG-0575), (3) the Final Environmental Statement for Indain Point 3 dated February 1975, and (4) the Environment Assessment dated October 4, 1989.

These documents are available for public inspection at the Commission's Public Document Room 2120 L Street, N.W., Washington, D.C. 20555 and at the White Plains Public Library, 100 Martine Avenue, White Plains, New York 10610.

Dated at Rockville, Maryland, this 4th day of October 1989.

FOR THE NUCLEAR REGULATORY COMMISSION

Robert A. Capra

Robert A. Capra, Director
Project Directorate I-1
Division of Reactor Projects - I/II
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