123 Main Street
White Plains, New York 10601
914 681.6950
914 287.3309 (Fax)

New York Power Authority

James Knubel
Senior Vice President and
Chief Nuclear Officer

September 24, 1998
IPN-98-101

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D.C. 20555

Subject: Indian Point 3 Nuclear Power Plant
Docket No. 50-286
License No. DPR-64
10 CFR 70.24 Exemption Request

References: See attached

Dear Sir:

Pursuant to 10 CFR 70.14(a), the New York Power Authority (the Authority) requests an exemption from the requirements of 10 CFR 70.24, "Criticality Accident Requirements" for the Indian Point 3 Nuclear Power Plant. This request addresses the criteria included in NRC Information Notice 97-77 dated October 10, 1997 (reference 1).

Attachment I contains the basis for this request as required by 10 CFR 70.24(d).

A specific exemption from the requirements of 10 CFR 70.24 was previously granted to Indian Point 3 and was contained in the special nuclear material license (SNM-1502), reference 2. However, this exemption was subsequently omitted from the 10 CFR 50 operating license at the time this license was issued. This was corrected with an exemption issued on March 27, 1997 (reference 3). The Authority is submitting this request for exemption in order to remove the conditions imposed by the exemption previously granted (reference 3).

A001

300020

The Authority believes an exemption is justified based on reasons similar to those for which the exemption was granted for the special nuclear materials license.

Attachment II contains commitments from the previous granted exemption. These will be voided following approval of this request. If you have any questions, contact Mr. K. Peters at (914) 736-8029.

Very truly yours,

J. Knubel
Senior Vice President and
Chief Nuclear Officer

Attachment

cc: U.S. Nuclear Regulatory Commission
475 Allendale Road
King of Prussia, PA 19406

Resident Inspector's Office
Indian Point Unit 3
U.S. Nuclear Regulatory Commission
P.O. Box 337
Buchanan, NY 10511

Mr. George F. Wunder, Project Manager
Project Directorate I-1
Division of Reactor Projects I/II
U.S. Nuclear Regulatory Commission
Mail Stop 14 B2
Washington, DC 20555

I. EXEMPTION REQUEST

Pursuant to 10 CFR 70.14(a), The New York Power Authority (Authority) requests an exemption from the requirements of 10 CFR 70.24(d), "Criticality Accident Requirements" for the Indian Point 3 Nuclear Power Plant (IP3). This request addresses the requirements for an exemption under 10 CFR 70.14(a) and 10 CFR 70.24(d).

10 CFR 70.24(d) states that licensees may request relief from the requirements of Section 70.24, in whole or in part, if good cause is shown. 10 CFR 70.24(c) states that holders of Part 50 operating licenses are exempt from 10 CFR 70.24(b) provisions. Therefore, only an exemption to Section 70.24(a) is being requested. The criteria included in NRC Information Notice 97-77 (reference 1) dated October 10, 1997, serves as the basis for this request.

The Authority requests that the NRC grant this exemption by December 1, 1998 to better facilitate receipt and processing of new fuel for IP3. The requested exemption will not present an undue risk to public health and safety.

II. DESCRIPTION OF CIRCUMSTANCES

A specific exemption from the requirements of 10 CFR 70.24 was previously granted to IP3 and was contained in the special nuclear material license (SNM-1502), reference 2. However, this exemption was subsequently omitted from the 10 CFR 50 operating license at the time this license was issued.

In March of 1997, the NRC granted the Authority's Indian Point 3 plant an exemption (reference 3) to 10 CFR 70.24 based on a reasonable assurance that, should an inadvertent criticality occur, the licensee will detect such a criticality and workers will respond properly. The revision of procedures, the use of a portable monitor, and worker training constituted good cause for the granting of the exemption in 1997.

The Authority believes a full exemption, without imposition of any conditions, is justified based on reasons same to those for which the exemption was granted for the special nuclear materials license. A criticality accident monitoring system was not and is not necessary at the Indian Point 3 Nuclear Power Plant. Exemptions from 10 CFR 70.24 are typically granted to 10 CFR 50 operating licenses based on the show of good cause as stated in this attachment. The NRC has recently granted an exemption under similar circumstances to other nuclear facilities. This request is similar to those requests and explains the reasons why the exemption should be granted.

III. SCOPE OF EXEMPTION REQUEST

10.CFR 70.24, "Criticality Accident Requirements," Part (a), states the following:

"Each licensee authorized to possess special nuclear material in a quantity exceeding 700 grams of contained uranium-235, 520 grams of uranium-233, 450 grams of plutonium, 1,500 grams of contained uranium-235 if no uranium enriched to more than 4 percent by weight of uranium-235 is present, 450 grams of any combination thereof, or one-half such quantities if massive moderators or reflectors made of graphite, heavy water or beryllium may be present, shall maintain in each area in which such licensed special nuclear material is handled, used, or stored, a monitoring system meeting the requirements of either paragraph (a)(1) or (a)(2), as appropriate, and using gamma- or neutron sensitive radiation detectors which will energize clearly audible alarm signals if accidental criticality occurs. This section is not intended to require underwater monitoring when special nuclear material is handled or stored beneath water shielding or to require monitoring systems when special nuclear material is being transported when packaged in accordance with the requirements of part 71 of this chapter."

Sources and Incore Detectors

Most SNM at IP3 is in the form of nuclear fuel. However, there are other quantities of SNM that are used, or may be handled, used or stored, at IP3. Items that contain non-fuel SNM can be sealed neutron sources for reactor startup, sealed sources for reactor instrumentation and radiation monitoring equipment calibration, and fission detectors.

The amount of non-fuel SNM at IP3 is significantly less than the quantities delineated in 10 CFR 70.24(a). The total amount of non-fuel SNM located on site is such that it meets the "forms not sufficient to form a critical mass" guidance in Section 1.1 of Regulatory Guide (RG) 10.3.

Based on the above, the Authority believes that good cause has been demonstrated for granting an exemption to the criticality accident monitoring requirements stipulated in 10 CFR 70.24(d) for non-fuel SNM.

Unirradiated Nuclear Fuel

Unirradiated nuclear fuel packaged in accordance with regulations is prevented from criticality events due to the construction of the package and the storage configuration of the fuel in the shipping container. Package design ensures that a criticality-safe configuration is maintained during transport, handling, storage, and accident conditions. Package design also precludes introduction of any moderating agents due to leak tight construction. The fuel that is received at IP3 is packaged in NRC approved shipping packages which satisfy the requirements of 10 CFR 71. Since personnel at IP3 only remove the new fuel from the shipping container in an area where Area Radiation

Monitoring (ARM) system equipment is present, the Authority believes that good cause has been demonstrated for granting an exemption to the criticality accident monitoring requirements stipulated in 10 CFR 70.24(d) for unirradiated nuclear fuel.

IV. CRITERIA FOR EVALUATING 10 CFR 70.24 EXEMPTION REQUESTS

The NRC provided seven (7) criteria to evaluate exemption requests to 10 CFR 70.24 in Reference 1. For clarity in evaluating the 10 CFR 70.24 exemption request, the criteria are restated below followed by the Authority's response.

Criterion 1 *Plant procedures do not permit more than [1 PWR or 3 BWR] new fuel [assembly/assemblies] to be in transit between their associated shipping cask and dry storage rack at one time.*

Response: Standard Operating Procedure SOP-RP-6, New Fuel Removal from Shipping Container and Inspection, currently permits only one new fuel assembly to be in transit between the associated shipping cask and dry storage rack. This is stated in the Precautions and Limitations section of the procedure.

Criterion 2 *The k-effective of the fresh fuel storage racks filled with fuel of the maximum permissible U-235 enrichment and flooded with pure water does not exceed 0.95, at a 95 percent probability, 95 percent confidence level.*

Response: The new fuel racks are used to receive and store new fuel in a dry condition upon arrival on site and prior to loading in the reactor. The new fuel racks are designed to store new fuel in a geometric array that precludes criticality. Existing analysis (reference 4) demonstrates that k_{eff} is maintained less than or equal to 0.95 when the new fuel racks are fully loaded and dry or flooded with moderator in the event of a design basis fuel handling accident. The moderator is pure water (no boron) at a temperature of 68^0F. A conservative value of 1.0 gm/cm^3 is used for the density of water. However, the presence of full density water is incredible due to the high elevation of the racks and drain openings that prevent water pooling.

Reference 4 was originally submitted for NRC review and approved as part of IP3's license change to utilize fuel with U235 enrichments up to 5 w/o, reference 5. This amendment states that fuel up to 5.05 w/o and at least 32 IFBA coated fuel rods does not exceed K_{eff} of 0.95 at a 95 percent probability, 95 percent confidence level.

Criterion 3 *If optimum moderation of fuel in the fresh fuel storage racks occurs when the fresh fuel storage racks are not flooded, the k-effective corresponding to this optimum moderation does not exceed 0.98, at a 95 percent probability, 95 percent confidence level.*

Response: This is not applicable to Indian Point 3. Optimum moderation conditions occur under low water density conditions as evaluated under criterion 2, above.

Criterion 4 *The k-effective of spent fuel storage racks filled with fuel of the maximum permissible U-235 enrichment and filled with pure water does not exceed 0.95, at a 95 percent probability, 95 percent confidence level.*

Response As stated in Technical Specification section 3.8.c. 7, reference 6, and evaluated in reference 4, the spent fuel storage racks will maintain K_{eff} <0.95 under technical specification fuel storage requirements. Fuel up to 4.6 w/o may be stored in a close packed array and fuel >4.6 w/o and up to 5.0 w/o stored in a checkerboard array will ensure a K_{eff} <0.95 with a 95 percent probability, 95 percent confidence level.

Criterion 5 *The quantity of forms of special nuclear material, other than nuclear fuel, that are stored on site in any given area is less than the quantity necessary for a critical mass.*

Response: The total amount of non-fuel SNM on site is such that it meets the "forms not sufficient to form a critical mass" guidance in Section 1.1 of Regulatory Guide (RG) 10.3 and the total amount of non-fuel SNM is significantly less than the quantities delineated in 10 CFR 70.24(a).

Criterion 6 *Radiation monitors, as required by GDC 63, are provided in fuel storage and handling areas to detect excessive radiation levels and to initiate appropriate safety actions.*

Response: The Radiation Monitoring System used at Indian Point 3 and the Fuel and Radioactivity Control (Criteria 60-64) is discussed in FSAR Section 1.3.6, reference 7, which states the following, in part:

> "Monitoring and alarm instrumentation are provided for fuel and waste storage and handling areas to detect inadequate cooling and to detect excessive radiation levels."

Based on the above, radiation monitors are provided in fuel handling and storage areas to detect excessive radiation levels and to initiate appropriate actions.

Criterion 7 *The maximum nominal U-235 enrichment is 5 wt percent.*

Response: The IP3 Technical Specification section 5.3.A.3 states in part that:

"The enrichment of reload fuel will be no more than 5.0 weight percent of U-235."

The fuel used at Indian Point 3 does not exceed the maximum nominal U-235 enrichment of 5 weight percent.

Cost Benefit

The Authority is incurring costs for the restrictions imposed by the previous exemption.

Risk to Public Health and Safety

Based on the Authority's responses to the above criteria, an inadvertent criticality is not expected to occur. Therefore, the issuance of this exemption does not threaten the public health and safety.

Environmental Assessment

Fuel handling activities at IP3 are performed in accordance with approved procedures to assure non criticality and radiation safety. Therefore, environmental effects from an inadvertent criticality are not expected, and granting this exemption will have no significant adverse effect on the quality of the environment.

Conclusion

The responses given to the criteria for evaluating 10 CFR 70.24 exemption requests, the operation of IP3 in accordance with the proposed exemption to 10 CFR 70.24(a) is authorized by law, will not present an undue risk to the public health and safety, is consistent with common defense and security, and is otherwise in the public interest. Good cause for granting an exemption should be granted in accordance with the requirements of 10 CFR 70.24(d).

The Authority will be voiding the commitments made in reference 8 when this exemption request is granted.

References

1. NRC Information Notice 97-77, "Exemptions form the Requirements of Section 70.24 of Title 10 of the Code of Federal Regulations," dated October 10,1997.

2. Special Nuclear Material License No. SNM-1502, dated November 29, 1974.

3. NRC letter to NYPA, "Issuance of Exemption from the requirements of 10 CFR 70.24 - Indian Point Nuclear Generating Unit No. 3 (TAC M97671)", dated March 27, 1997.

4. Westinghouse document, "Criticality Analysis of the Indian Point Unit 3 Fresh and Spent Fuel Racks", dated October 1996.

5. NRC letter to NYPA, "Issuance of Amendment for Indian Point Nuclear Generating Unit No. 3 (TAC NO. M96474)", dated April 15, 1997.

6. Indian Point 3 Technical Specifications

7. Indian Point 3 Updated Final Safety Analysis Report, dated December 1997.

8. NYPA letter to NRC, IPN-96-127, "Request for Exemption from 10 CFR 70.24 Criticality Accident Requirements," dated December 20, 1996.

Commitments made to the NRC

Number	Commitment	Due
IPN-98-101-01	Upon receipt of exemption request, void the following NRC commitment: IPN-97-041 (97-006-A): Revise applicable procedures to ensure that criticality monitoring (at least one detector, may be portable) is available and in use in the fuel storage building when handling dry fuel assemblies (i.e. movement from shipping canisters to storage racks, movement from storage racks to the Spent Fuel Pool). This monitoring capability will meet the detection (neutron to gamma ratio of 0.3) and sensitivity requirements of Section 5.6 and 5.7 of ANSI/ANS-8.3-1986, "American Nation Standard Criticality Alarm System."	As soon as exemption is granted
IPN-98-101-02	Upon receipt of exemption request, void the following NRC commitment: IPN-97-041 (97-006-B): Provide training on responding to a criticality monitor alarm to Radworkers accessing the Fuel Storage Building, during periods of dry fuel handling, as an interim measure. This training will be provided, as necessary, until dry fuel handling operation in 1997 is complete and the subject material has been incorporated into the Radworker portion of General Employee Training.	As soon as exemption is granted
IPN-98-101-03	Upon receipt of exemption request, void the following NRC commitment: IPN-97-041 (97-006-C): Upgrade the Radworker portion of General portion of General Employee Training to include responding to a criticality alarm, for initial training and retraining.	As soon as exemption is granted