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**New York Power
Authority**

William J. Cahill, Jr.
Chief Nuclear Officer

December 20, 1996
IPN-96-127

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
**Request for Exemption from 10 CFR 70.24
Criticality Accident Requirements**

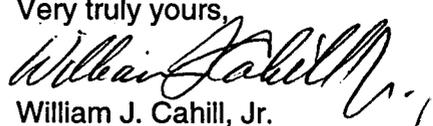
Dear Sir:

Pursuant to 10 CFR 70.14(a), The New York Power Authority (Authority) requests an exemption from the requirements of 10 CFR 70.24, "Criticality Accident Requirements" for Indian Point 3 Nuclear Power Plant. This request addresses the requirements for an exemption under 10 CFR 70.14(a) and 10 CFR 70.24(d), and is an administrative matter that involves no changes to radiation monitoring systems or emergency procedures currently used at Indian Point 3. Attachment I contains the basis for this request.

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). However, this exemption was subsequently omitted from the 10 CFR 50 operating license at the time this license was issued. The Authority is submitting this request for exemption in order to resolve this matter by obtaining formal relief from the requirements of 10 CFR 70.24.

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. A criticality accident monitoring system was not and is not necessary at the Indian Point 3 Nuclear Power Plant.

The Authority is making no new commitments in this letter. If you have any questions contact Mr. K. Peters at (914) 736-8029.

Very truly yours,

William J. Cahill, Jr.
Chief Nuclear Officer

Attachment
cc: See next page

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A001/1

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U.S. Nuclear Regulatory Commission
Resident Inspectors' Office
Indian Point 3 Nuclear Power Plant

ATTACHMENT I TO IPN-96-127

JUSTIFICATION FOR EXEMPTION FROM CRITICALITY ACCIDENT REQUIREMENTS

**NEW YORK POWER AUTHORITY
INDIAN POINT 3 NUCLEAR POWER PLANT
DOCKET NO. 50-286
DPR-64**

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, "Criticality Accident Requirements" for Indian Point 3 Nuclear Power Plant. This request addresses the requirements for an exemption under 10 CFR 70.14(a) and 10 CFR 70.24(d), and is an administrative matter that involves no changes to radiation monitoring systems or emergency procedures currently used at Indian Point 3.

II. DESCRIPTION OF CIRCUMSTANCES

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)¹. However, this exemption was subsequently omitted from the 10 CFR 50 operating license at the time this license was issued.

The Authority believes an exemption is justified based on reasons similar to those for which the exemption was granted for the special nuclear materials license². A criticality accident monitoring system was not and is not necessary at the Indian Point 3 Nuclear Power Plant. Such exemptions from 10 CFR 70.24 are typically granted to 10 CFR 50 operating licenses. The NRC has recently granted an exemption under similar circumstances to other nuclear facilities³. This request is similar to those requests and explains the reasons why the exemption should be granted.

III. REGULATORY REQUIREMENTS

10 CFR 70.24(a) requires licensees who possess certain amounts of special nuclear material to maintain a monitoring system and emergency procedures for detection of and response to accidental criticality. These requirements apply to Indian Point 3. The specific requirements are:

1. "...shall maintain in each area in which such licensed 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."
2. "The licensee shall maintain emergency procedures for each area in which this licensed special nuclear material is handled, used, or stored to ensure that all personnel withdraw to an area of safety upon the sounding of the alarm. These procedures must include the conduct of drills to familiarize personnel with the evacuation plan..."
3. "The licensee shall retain a copy of current procedures for each area as a record for as long as licensed special nuclear material is handled, used, or stored in the area. The licensee shall retain any superseded portion of the procedures for three years after the portion is superseded."

10 CFR 70.24(b) requires licensees authorized to possess special nuclear material in quantities in excess of those in paragraph (a) to:

1. "Provide the means for identifying quickly which individuals have received doses of 10 rads or more."
2. "Maintain facilities and supplies at the site for decontamination of personnel, arrangements for the services of a physician and other medical personnel qualified to handle radiation emergencies, arrangements for transportation of injured or contaminated individuals to treatment facilities, and arrangements for treatment of individuals at treatment facilities outside the site boundary."

IV. JUSTIFICATION FOR REQUEST

As stated in 10 CFR 70.14(a) the NRC has authority to grant exemptions from the requirements of 10 CFR 70. 10 CFR 70.14(a), "Specific Exemptions" states, "The Commission may, upon application of any interested person or upon its own initiative, grant such exemption from the requirements of the regulations in this part as it determines are authorized by law and will not endanger life or property or the common defense and security and are otherwise in the public interest." In addition, 10 CFR 70.24(d) clearly states that licensees may apply to the Commission for exemptions from the requirements of 10 CFR 70.24 for "good cause". The following provide the justification for the exemption request for Indian Point 3.

1. An exemption request will not endanger life or property or the common defense and security if the request meets the statutory standard of adequate protection to the health and safety of the public. To further ensure the common defense and security are not endangered, the exemption request must demonstrate that the loss or diversion of special nuclear material is precluded. As described below, the use, storage, and handling of special nuclear material at Indian Point 3 provides adequate protection to the health and safety of the public, and precludes loss or diversion of special nuclear material. In particular, this discussion focuses on the following points: design, characteristics, Technical Specifications requirements, procedural controls, and existing accident analyses.

a) Use of Special Nuclear Material and Storage and Handling of Non-Nuclear Fuel Special Nuclear Material

Special nuclear material is principally present at Indian Point 3 in the form of nuclear fuel. However, other quantities of special nuclear material are used, or may be used (and stored) at Indian Point 3 in the form of fissile material incorporated into, fission chambers for nuclear instrumentation, primary source assemblies, and Health Physics calibration sources. The total amount of special nuclear material used in non-fuel capacities is small, significantly less than the quantity specified in 10 CFR 70.24(a). The small quantity of non-fuel special nuclear material present, and the form in which the special nuclear material is used and stored, precludes an inadvertent criticality.

Inadvertent or accidental criticality of special nuclear material while in use in the reactor vessel is precluded through compliance with the facility technical specifications, including reactivity requirements (e.g., shutdown margins, limits on control rod movement), instrumentation requirements (e.g., reactor power and radiation monitors), and controls on refueling operations (e.g., interlocks and source range monitor requirements). In addition, the operators' duties include observing instruments that monitor the behavior of the nuclear fuel in the reactor, this assures the facility is operated in such a manner as to preclude inadvertent criticality. Since access to the fuel in the reactor vessel is not physically possible while in use and is procedurally controlled during refueling, there are no concerns associated with loss or diversion of the fuel.

Indian Point 3 maintains radiation controls and a health physics program in accordance with the requirements of 10 CFR 20, the Technical Specifications and the updated Final Safety Analysis Report, and provides for dose assessment, decontamination and treatment in accordance with those requirements and the requirements of the Emergency Plan.

Based on the above, the requirements of 10 CFR 70.24 are not necessary for the use of special nuclear material or the storage and handling of special nuclear material not in the form of fuel; and thus, granting this exemption will not endanger life or property or the common defense and security.

b) Storage of Special Nuclear Material as Nuclear Fuel

Special nuclear material as nuclear fuel is stored in one of two locations; the spent fuel pool or the new fuel racks. The spent fuel pool is used to store irradiated fuel under water after its removal from the reactor and new fuel prior to placement in the reactor vessel. The pool is designed to store fuel in a geometric array that precludes criticality. Analysis has shown that K_{eff} in all areas of the spent fuel pool is maintained less than or equal to 0.95, even in the event of a design basis fuel handling accident. In addition, the Technical Specification requirement for boron concentration in the spent fuel pool provides further assurance against criticality.

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 safety evaluations demonstrate 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 unborated water or in the event of a design basis fuel handling accident.

New fuel is shipped in a plastic wrap. This plastic wrap is removed from the fuel prior to being placed in the new fuel racks. Therefore, there is no concern that the plastic wrap used for shipment of fuel will be in place to retain water from flooding of overhead sources.

Therefore, the requirements of 10 CFR 70.24 are not necessary for special nuclear material in the form of nuclear fuel while being stored in the spent fuel pool or new fuel racks; and thus, granting this exemption will not endanger life or property or the common defense and security.

c) Handling of Special Nuclear Material as Nuclear Fuel

Both irradiated and unirradiated fuel is moved to and from, the reactor, the spent fuel pool, and the new fuel racks (unirradiated fuel only) to accommodate refueling operations. Fuel movement into the facility and within the reactor vessel or the spent fuel pool also occurs. In all cases, fuel movement is procedurally controlled and designed to preclude conditions involving criticality concerns. Moreover, previous accident analyses demonstrate that a design basis fuel handling accident (i.e., a dropped fuel element) will not create conditions that exceed design specifications. In addition, the Technical Specifications address refueling Operations and limit the handling of fuel to ensure against an accidental criticality and preclude certain movements over the spent fuel pool and the reactor vessel.

Procedural controls require nuclear fuel handling to be authorized and monitored, thereby minimizing the potential opportunity for loss or diversion. Similarly, the absence of an accidental criticality monitoring system would not affect the capability of the Authority to ensure nuclear fuel is safeguarded during handling. Relative to the special nuclear material the previous exemption from the requirements of 10 CFR 70.24 was based upon similar information provided to the NRC.

Therefore, the requirements of 10 CFR 70.24 are not necessary for the handling of nuclear fuel. Granting this exemption relative to nuclear fuel handling will not endanger life or property or the common defense and security.

2. There is no specific detailed guidance on how to apply the "public interest" standard of 10 CFR 70.14(a). However, in a 1985 amendment to 10 CFR 50.12(a) the NRC deleted the public interest standard from that section in favor of defining "special circumstances" that justify requesting an exemption from the NRC regulations⁴. It further discussed that since most exemption requests were in the context of 10 CFR 50 that revisions to other regulations, to be consistent with this rule change, was not necessary at this time. It seems reasonable to use the "special circumstances" articulated in 10 CFR 50.12(a) as guidance in addressing the "public interest" criterion of 10 CFR 70.14(a).

Among the several special circumstances identified in 10 CFR 50.12(a)(2), there are two that are relevant to this exemption request:

- (a)(2)(ii) Application of the regulation in the particular circumstances would not serve the underlying purpose of the rule or is not necessary to achieve the underlying purpose of the rule; or

(a)(2)(iii) Compliance would result in undue hardship or other costs that are significantly in excess of those contemplated when the regulation was adopted, or that are significantly in excess of those incurred by others similarly situated..."

a) The explicit language of 10 CFR 70.24 does not identify the purpose(s) for requiring an accidental criticality monitoring system and the associated emergency operating procedures. Furthermore, the regulatory history underlying this requirement indicates that:

"The following amendments to these regulations is designed to assure that all licensees who are authorized to possess special nuclear material in amounts which may produce conditions of accidental criticality have in operation adequate alarm systems and emergency plans to evacuate personnel."⁵

Based on this language, the NRC apparently promulgated 10 CFR 70.24 to ensure that licensees are aware of, and take appropriate response to, conditions of accidental criticality.

It can be concluded, from this language, that where design and/or procedural safeguards ensure against conditions of accidental criticality that compliance with 10 CFR 70.24 would not serve the underlying purpose of the law.

Exemption from the requirements of 10 CFR 70.24 is also appropriate in some instances in accordance with 10 CFR 70.24(d) if good cause exists. The Authority believes that good cause exists for the following reasons:

- The design of areas used for fuel storage and the procedures used for handling, using and storing fuel preclude accidental criticality.
- Changes in the handling, use and storage of special nuclear material that have occurred, since the original exemption was granted, do not make the requirements of 10 CFR 70.24 necessary.
- As noted in section C.1 of Regulatory Guide 8.12, "Criticality Accident Alarm Systems", Revision 2, October 1988, "Section 70.24 of 10 CFR Part 70 requires, alarm coverage "in each area in which such licensed special nuclear material is handled, used or stored...", whereas paragraph 4.2.1 of the standard states that the need for criticality alarms must be evaluated for such areas. If such an evaluation does not determine that a potential for criticality exists, as for example where the quantities or form of special nuclear material make criticality practically impossible or where geometric spacing is used to preclude criticality, such as in some storage spaces for unirradiated nuclear power plant fuel, it is appropriate to request an exemption from section 70.24".

As discussed above, the design of and safety analyses for the spent fuel pool and new fuel racks, as well as the associated procedural control and Technical Specification requirements, ensure conditions of criticality are precluded. Therefore, the application of 10 CFR 70.24 to Indian Point 3 would not serve, and is not necessary to achieve, the underlying purpose of the law.

- b) Because the criticality monitoring system is not necessary to meet the underlying purpose of the law, the expenditures for purchasing such a system is not necessary and could otherwise be put to use improving operation and material condition of the plant. Accordingly, the Authority believes, compliance with 10 CFR 70.24 would result in an undue hardship and other costs that are significantly in excess of those likely contemplated when this regulation was adopted.

It is the Authority's understanding that exemptions from the requirements of 10 CFR 70.24 are typically granted to Part 50 Licensees. As a recent example, Southern Nuclear Company was granted exemptions from the requirements of 10 CFR 70.24 for several of its facilities. Moreover, this exemption was previously granted to Indian Point 3. Therefore since Indian Point 3 is not dissimilar from other facilities that have received such an exemption, compliance with 10 CFR 70.24 would create an undue hardship and costs significantly in excess of those incurred by others who were granted exemptions.

Based on these special circumstances which would justify the granting of this exemption application using the guidance of 10 CFR 50.12(a), the exemption request is in the public interest for the purposes of 10 CFR 70.14(a).

V. CONCLUSION

In summary, the exemption from the requirements of 10 CFR 70.24 for Indian Point 3 is authorized by law, will not endanger life or property or the common defense and security, is in the public interest due to the presence of special circumstances and is requested for good cause, we respectfully request that, in accordance with 10 CFR 70.14(a), the NRC grant the exemption in whole from 10 CFR 70.24.

End Notes

1. Special Nuclear Material License No. SNM-1502, Dated November 29, 1974
2. Letter from Consolidated Edison Company of New York to Mr. Edson G. Case of the Atomic Energy Commission, Application for special nuclear materials license, Dated November 4, 1974
3. Letters from the NRC dated July 31, 1996 granting exemptions from 10 CFR 70.24 to the Joseph M. Farley Nuclear Plant Units 1 and 2, and Edwin I. Hatch Nuclear Plant Units 1 and 2.
4. 50784 Federal Register / Vol. 50, No.239 / Thursday, December 12, 1985
5. Tuesday, November 11, 1958, Federal Register, 8747