

UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

In the Matter of)
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Niagara Mohawk Power Corporation) Docket No. 50-220
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)
(Nine Mile Point Nuclear Station,)
Unit No. 1))

EXEMPTION

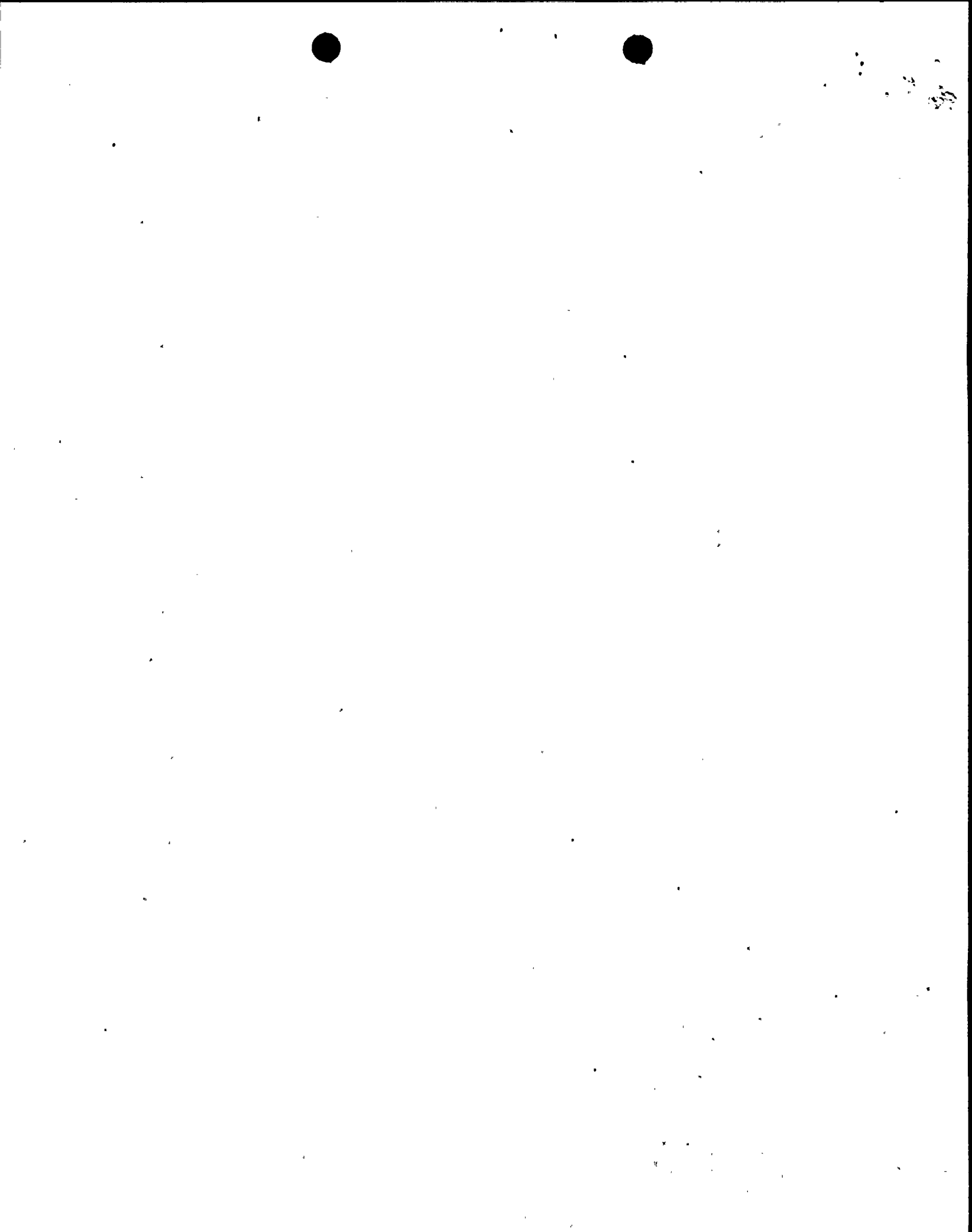
I.

Niagara Mohawk Power Corporation (the licensee) is the holder of Facility Operating License No. DPR-63, which authorizes operation of the Nine Mile Point Nuclear Station, Unit No. 1 (NMP1). The license provides that the licensee is subject to all rules, regulations, and orders of the U.S. Nuclear Regulatory Commission (the NRC or Commission) now or hereafter in effect.

The facility consists of two boiling-water reactors at the licensee's site located in Oswego County, New York. This exemption applies only to NMP1.

II.

The Code of Federal Regulations, 10 CFR 70.24, "Criticality Accident Requirements," requires that each licensee authorized to possess special nuclear material shall maintain a criticality accident monitoring system in each area where such material is handled, used, or stored. Subsection (a)(1) and (a)(2) of 10 CFR 70.24 specifies detection and sensitivity requirements that these monitors must meet. Subsection a(1) also specifies that all areas subject to criticality accident monitoring must be covered by two detectors. Subsection (a)(3) of 10 CFR 70.24 requires licensees to maintain emergency procedures for each area in which



this licensed special nuclear material is handled, used, or stored and provides (1) that the procedures ensure that all personnel withdraw to an area of safety upon the sounding of a criticality accident monitor alarm, (2) that the procedures must include drills to familiarize personnel with the evacuation plan, and (3) that the procedures designate responsible individuals for determining the cause of the alarm and placement of radiation survey instruments in accessible locations for use in such an emergency. Subsection (b)(1) of 10 CFR 70.24 requires licensees to have a means to identify quickly personnel who have received a dose of 10 rads or more. Subsection (b)(2) of 10 CFR 70.24 requires licensees to maintain personnel decontamination facilities, to maintain arrangements for a physician and other medical personnel qualified to handle radiation emergencies, and to maintain arrangements for the transportation of contaminated individuals to treatment facilities outside the site boundary. Paragraph (c) of 10 CFR 70.24 exempts Part 50 licensees from the requirements of paragraph (b) of 10 CFR 70.24 for special nuclear material used or to be used in the reactor. Paragraph (d) of 10 CFR 70.24 states that any licensee who believes that there is good cause why it should be granted an exemption from all or part of 10 CFR 70.24 may apply to the Commission for such an exemption and shall specify the reasons for the relief requested. Paragraph (a) of 10 CFR 70.14 states that the Commission may, upon application of any interested person or upon its own initiative, grant such exemption from 10 CFR Part 70 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.

III.

The special nuclear material that could be assembled into a critical mass at NMP1 is in the form of nuclear fuel; the quantity of special nuclear material other than fuel that is stored on site is small enough to preclude achieving a critical mass. The NRC staff has evaluated the



possibility of an inadvertent criticality of the nuclear fuel at NMP1 and has determined that such an accident cannot occur if the licensee meets the following seven criteria:

1. Plant procedures do not permit more than 3 new assemblies to be in transit between the associated shipping cask and dry storage rack at one time.
2. The k-effective of the fresh fuel storage racks filled with fuel of the maximum permissible Uranium (U)-235 enrichment and flooded with pure water does not exceed 0.95 at a 95% probability with a 95% confidence level.
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% probability with a 95% confidence level.
4. The k-effective does not exceed 0.95 at a 95% probability with a 95% confidence level in the event that the spent fuel storage racks are filled with fuel of the maximum permissible U-235 enrichment and flooded with pure water.
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.
6. Radiation monitors, as required by General Design Criterion (GDC) 63 of Appendix A to 10 CFR 50, are provided in fuel storage and handling areas to detect excessive radiation levels and to initiate appropriate safety actions.
7. The maximum nominal U-235 enrichment is limited to 5 weight percent.

By letter dated November 6, 1998, the licensee requested an exemption from 10 CFR 70.24. In this exemption request, the licensee addressed the seven criteria given above and indicated how each criterion is satisfied at NMP1. The licensee stated that it does not analyze for the optimum moderation condition as addressed in Criterion 3 above, but has used a standard industry practice by implementing administrative and physical controls in accordance



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with General Electric's Service Information Letter 152, "Criticality Margins for the Storage of New Fuel," dated March 31, 1976. To preclude the existence of an optimum moderation condition in the new fuel vault area, the licensee uses the following controls or design features: the new fuel vault is equipped with a drain to prevent flooding; the pre-fire plans will be revised before any more new fuel is received to ensure that fire fighting foam or water will not be directed towards the new fuel vault during dry storage of new fuel; and only one new fuel vault (non-combustible) cover is removed at a time and, if the vault is left unattended, either the new fuel vault cover will be reinstalled or a solid fireproof cover installed. The NRC staff has found these practices and features acceptable.

Regarding Criterion 4 above, the licensee states that there are two types of spent fuel storage racks in the NMP1 spent fuel storage pool—those of the poison type incorporating a neutron absorbing material and those of a non-poison type without special neutron absorbers. Both types are designed to maintain k-effective less than or equal to 0.95 under all storage conditions. As required by NMP1 Technical Specification (TS) 5.5, fuel assemblies stored in the spent fuel storage locations of the non-poison flux trap design are limited to 3.0 weight percent of U-235 per axial centimeters of assembly. Since all fuel assemblies used at NMP1 since the 1980's exceed 3.0 weight percent of U-235, the non-poison racks are not used for unirradiated fuel. Spent fuel storage racks of the poison type incorporating a neutron absorber are analyzed and designed consistent with Criterion 4. Thus, the NRC staff concludes that the storage of new fuel in spent fuel racks at NMP1 is consistent with Criterion 4 above.

The NRC staff has reviewed the licensee's submittal and has determined that NMP1 meets the criteria for prevention of inadvertent criticality; therefore, the NRC staff has



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determined that there is no credible way in which an inadvertent criticality could occur in special nuclear materials handling or storage areas at NMP1.

The purpose of the criticality monitors required by 10 CFR 70.24 is to ensure that if a criticality were to occur during the handling of special nuclear material, personnel would be alerted to that fact and would take appropriate action. The NRC staff has determined that there is no credible way in which such an accident could occur. The licensee has radiation monitors consistent with GDC 63 in fuel storage and handling areas. These monitors would alert personnel to excessive radiation levels and allow them to initiate appropriate safety actions. The low probability of an inadvertent criticality, together with the licensee's adherence to GDC 63, constitute good cause for granting an exemption to the requirements of 10 CFR 70.24.


IV.

The Commission has determined that, pursuant to 10 CFR 70.14(a), this exemption is authorized by law, will not endanger life or property or the common defense and security, and is otherwise in the public interest. Therefore, the Commission hereby grants the licensee an exemption from the requirements of 10 CFR 70.24 for NMP1.

Pursuant to 10 CFR 51.32, the Commission has determined that the granting of this exemption will have no significant impact on the quality of the human environment [63 FR 67944].

This exemption is effective upon issuance.

FOR THE NUCLEAR REGULATORY COMMISSION


Samuel J. Collins, Director
Office of Nuclear Reactor Regulation

Dated at Rockville, Maryland,
this 10th day of December

1998.

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