

NUCLEAR REGULATORY COMMISSION

[Docket Nos. 50-317 and 50-318]

Baltimore Gas and Electric Company; Calvert Cliffs Nuclear Power Plant, (Unit Nos. 1 and 2)

Exemption

I

The Baltimore Gas and Electric Company (BGE) is the holder of Facility Operating License Nos. DPR-53 and DPR-69 for the Calvert Cliffs Nuclear Power Plant, Unit Nos. 1 and 2 (Calvert Cliffs). The licenses provide, among other things, that the licensee is subject to all rules, regulations, and orders of the Commission now or hereafter in effect.

II

Subsection (a) of 10 CFR 70.24, "Criticality Accident Requirements," requires that each licensee authorized to possess special nuclear material shall maintain in each area where such material is handled, used, or stored, an appropriate criticality monitoring system. In accordance with Subsection (a)(1) of 10 CFR 70.24, coverage of all such areas at Calvert Cliffs shall be provided by two criticality detectors. However, exemptions may be requested pursuant to 10 CFR 70.24(d), provided that the licensee believes that good cause exists for the exemption.

By letter dated August 19, 1996, as supplemented February 14, 1997, the licensee requested an exemption from the requirements of 10 CFR 70.24(a). A previous exemption from the provisions of 10 CFR 70.24 for the storage of special nuclear material, including reactor fuel assemblies [maximum amount of 2,440 kg of U-235 in uranium enriched to no more than 3.00 weight percent (w/o)] for Unit 1 and maximum amount of 2450 Kg of U-235 in uranium enriched to no more than 3.05% was granted to Baltimore Gas and Electric Company for Calvert Cliffs Unit 1 in NRC Materials License No. SNM-1364 and for Calvert Cliffs Unit 2 in NRC Materials License No. SNM-1624. The materials licenses were issued on August 23, 1973, for Unit 1 and May 18, 1976, for Unit 2.

The materials licenses expired upon conversion of the construction permits to operating licenses, which was July 31, 1974, for Unit 1 and November 30, 1976, for Unit 2, respectively. The basis for the current exemption request is the same as for the original request. The licensee proposes to handle and store unirradiated fuel without having a

criticality monitoring system as required by 10 CFR 70.24.

The basis for the exemption is that inadvertent or accidental criticality will be precluded, in accordance with General Design Criterion 62 through compliance with the Calvert Cliffs Technical Specifications, the geometric spacing of fuel assemblies in the new fuel storage racks and spent fuel storage pool, and administrative controls imposed on fuel handling procedures.

Special nuclear material, as nuclear fuel, is stored in the spent fuel pool, the new fuel storage racks, and the Independent Spent Fuel Storage Installation. The spent fuel pool is used to store irradiated fuel under water after its discharge from the reactor, and new fuel prior to loading into the reactor. The Independent Spent Fuel Storage Installation utilizes dry canisters to store spent fuel.

Special nuclear material is also present in the form of excore fission chamber detectors and startup neutron sources. The small quantity of special nuclear material present in these latter items precludes an inadvertent criticality.

The spent fuel pool is designed to store the fuel in a geometric array using a solid neutron absorber that precludes criticality. The effective neutron multiplication factor, K_{eff} , is maintained less than or equal to 0.95 by the solid neutron absorber. Although soluble boron is maintained in the spent fuel pool, no credit is taken for it in determining K_{eff} .

The new fuel storage racks may be used to receive and store new fuel in a dry condition upon arrival on site and prior to loading in the reactor or spent fuel pool. The spacing between new fuel assemblies in the storage racks is sufficient to maintain the array in a subcritical condition even under accident conditions assuming the presence of moderator. The maximum enrichment of 5.0 wt% U-235 for the new fuel assemblies results in a maximum K_{eff} of 0.89 at a water density of 1.0 gm/cc (fully flooded), and a K_{eff} of less than 0.89 for aqueous foam at optimum moderation conditions.

Nuclear fuel is moved between the new fuel storage racks, the reactor vessel, the refueling pool, and the spent fuel pool to accommodate refueling operations. In addition, fuel is moved into the facility and within the reactor vessel, or within the spent fuel pool. In all cases, fuel movements are procedurally controlled and designed to preclude conditions involving criticality concerns. These procedural controls include:

1. Plastic bags or other dust covers placed around new core components are removed or rendered incapable of holding water prior to inserting the assemblies into the new fuel storage racks.

2. Only the auxiliary hook of the spent fuel cask handling crane may be used to move new fuel. Therefore, only one fuel assembly can be moved at a time.

3. A maximum of two fuel assemblies are permitted outside of the approved shipping container or new fuel storage rack location at one time, one of which must be located in the new fuel inspection platform. Although two highly enriched assemblies may achieve criticality under close proximity, fully flooded conditions, it is highly improbable that the required water level for neutron moderation could be attained. The spent fuel pool area and new fuel handling areas would have to be flooded to an elevation approximately 17 feet above the floor. Based on the possible sources of water, achieving this fully flooded condition would require blockage of floor drains, sealing of access doors, and numerous procedure violations. In addition, the spent fuel pool high level alarm would alert operators of flooding from any of these sources. Since no fire protection sprinkler system exists in the new fuel handling area, there is no source of low-density aqueous foam moderation.

Technical Specifications also preclude certain movements over the spent fuel pool to prevent an inadvertent criticality. Previous accident analyses have demonstrated that a fuel handling accident (i.e., a dropped fuel assembly) will not create conditions which could result in inadvertent criticality. Additionally, the Emergency Response Plan contains provisions for coping with unusual events such as a dropped fuel assembly.

In order to meet the requirements of General Design Criterion 63, three area radiation monitors are provided for detecting high radiation levels in the spent fuel pool area, the spent fuel handling machine, and the new fuel storage area. At the alarm setpoint of these monitors, audible and visual alarms annunciate locally and in the control room. The output of each monitor is also recorded in the control room.

Based upon the information provided, there is reasonable assurance that irradiated and unirradiated fuel will remain subcritical during handling and storage. The circumstances for granting an exemption to 10 CFR 70.24 are met because criticality is precluded with the present design configuration, Technical

Specifications requirements, administrative controls, and the fuel handling equipment and procedures. Therefore, the staff has determined that the Licensee has demonstrated good cause for the granting of the exemption, thus the exemption should be granted.

III

Accordingly, the Commission has determined that, pursuant to 10 CFR 70.14, 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 Baltimore Gas and Electric Company an exemption as described in Section II above from 10 CFR 70.24, "Criticality Accident Requirements" for Calvert Cliffs Nuclear Power Plant, Unit Nos. 1 and 2.

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 (61 FR 52959).

This exemption is effective upon issuance.

Dated at Rockville, Maryland, this 18th day of July 1997.

For the Nuclear Regulatory Commission.

Samuel J. Collins,

Director, Office of Nuclear Reactor Regulation.

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NUCLEAR REGULATORY COMMISSION

[Docket No. 50-244]

Rochester Gas and Electric Corporation, R. E. Ginna Nuclear Power Plant

Exemption

I

The Rochester Gas and Electric Corporation (the licensee) is the holder of Facility Operating License No. DPR-18, which authorizes operation of the R. E. Ginna Nuclear Power Plant. The license provides that the licensee is subject to all rules, regulations, and orders of the U.S. Nuclear Regulatory Commission (NRC or the Commission) now or hereafter in effect.

The facility consists of a pressurized-water reactor at the licensee's site located in Wayne County, New York.

II

The Code of Federal Regulations at 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 in which such material is handled, used, or stored. Sections 70.24 a(1) and a(2) specify detection and sensitivity requirements that these monitors must meet. Section 70.24 a(1) also specifies that all areas subject to criticality accident monitoring must be covered by two detectors. Section 70.24(a)(3) 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. Section 70.24(b)(1) requires licensees to have a means by which to quickly identify personnel who have received a dose of 10 rads or more. Section 70.24(b)(2) 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. Section 70.24(c) exempts Part 50 licensees from the requirements of 10 CFR 70.24(b) for special nuclear material used or to be used in the reactor. Subsection 70.24(d) states that any licensee who believes that there is good cause why he 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.

III

The special nuclear material that could be assembled into a critical mass at the R. E. Ginna Nuclear Power Plant 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 Commission's technical staff has evaluated the possibility of an inadvertent criticality of the nuclear fuel at the R. E. Ginna Nuclear Power Plant and has determined that such an accident is unlikely to occur if the licensee meets the following eight criteria:

1. Plant procedures do not permit more than one PWR fuel assembly or

three BWR fuel assemblies to be in storage or transit between their associated shipping cask or storage rack at one time.

2. The requirement is met that k-effective not exceed 0.95, at a 95% probability, 95% confidence level with the fresh fuel storage racks filled with fuel of maximum permissible U-235 enrichment and flooded with pure water.

3. The requirement is met that k-effective not exceed 0.98, at a 95% probability, 95% confidence level with the fresh fuel storage racks filled with fuel at the maximum permissible U-235 enrichment and flooded with moderator at the (low) density corresponding to optimum moderation.

4. The requirement is met that k-effective not exceed 0.95, at a 95% probability, 95% confidence level with the spent fuel storage racks 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, such as sources or detectors, that are stored onsite in one area, is less than that necessary for a critical mass.

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.

7. The maximum nominal U-235 enrichment is 5 wt%.

8. Training is provided to the appropriate personnel for safely handling fresh fuel.

By letter dated June 5, 1997, Rochester Gas and Electric Corporation requested an exemption from 10 CFR 70.24. In this exemption request, the licensee addressed the eight criteria given above. The NRC staff has reviewed the licensee's submittal and has determined that the R. E. Ginna Nuclear Power Plant meets the criteria for prevention of inadvertent criticality; therefore, the staff has determined that an inadvertent criticality is highly unlikely in special nuclear material handling or storage areas at the R. E. Ginna Nuclear Power Plant.

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. Although the staff has determined that it is highly unlikely that such an accident could occur, the licensee has radiation monitors, as required by General Design Criterion 63 (GDC), in fuel storage and handling areas. These monitors will alert