

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

In the Matter of)
)
WOLF CREEK NUCLEAR OPERATING CORPORATION) Docket No. 50-482
)
(Wolf Creek Generating Station, Unit 1))

EXEMPTION

I.

On June 4, 1985, the Commission issued Facility Operating License No. NPF-42 to Wolf Creek Nuclear Operating Corporation (the licensee) for the Wolf Creek Generating Station, Unit 1 (WCGS). The license provides, 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 (SNM) 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 WCGS 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. In particular, Regulatory Guide 8.12, Revision 2, "Criticality Accident Alarm System," states that it is appropriate to request an exemption from 10 CFR 70.24 if an evaluation determines that a

potential for criticality does not exist, as for example where geometric spacing is used to preclude criticality.

By letter dated September 19, 1995, and supplement dated March 21, 1997, the licensee requested an exemption from the requirements of 10 CFR 70.24. A previous exemption from the provisions of 10 CFR Part 70.24 for the storage of SNM, including reactor fuel assemblies [maximum amount of 2,400 kg of U-235 in uranium enriched to no more than 3.50 weight percent (w/o)], was granted to Wolf Creek Nuclear Operating Corporation (WCNOC) in NRC Materials License No. SNM-1929. The materials license was issued on May 9, 1984, and expired upon conversion of the construction permit to an operating license on June 4, 1985. In this request the licensee proposes to handle and store unirradiated fuel in the fuel handling building and in the new fuel section of the spent fuel pool without having a criticality monitoring system with two separate criticality detectors or performing the emergency drills as required by 10 CFR 70.24.

The basis for the exemption is that the potential for accidental criticality is precluded because of the geometric spacing of fuel in the new fuel storage facility and spent fuel pool and administrative controls imposed on fuel handling procedures from the time the fuel is removed from approved shipping containers, until it is placed in specially designed storage racks.

SNM is present at WCGS principally in the form of nuclear fuel, although other quantities of SNM are present in the incore nuclear instrumentation, health physics sources, and in quality control radiography sources. However, the small quantity of SNM present in these latter items precludes any criticality concerns.

A new fuel storage facility (NFSF) is located within the fuel building, and provides onsite dry storage for 66 new fuel assemblies (approximately one-third core), arranged in three double rows (2x11) of ports. Each port will hold just one fuel assembly. The ports within each double row are on 21-inch centers and there is a nominal 28-inch aisle between each pair of rows. The spacing between new fuel assemblies in the storage racks is sufficient to maintain the array in a subcritical condition even under accident conditions where unborated water is assumed present. For the flooded condition, assuming new fuel with a maximum enrichment of 4.5 w/o U-235 in place, the effective multiplication factor (k_{eff}) does not exceed 0.95. The effective multiplication factor does not exceed 0.98 assuming optimum moderation by low-density sources of moderator such as aqueous foam or mist. The NFSF is protected from the effects of natural phenomena, including earthquakes, tornadoes, hurricanes, floods, and external missiles. The NFSF is designed to perform its intended function and maintain structural integrity after a safe shutdown earthquake (SSE) or following a postulated hazard, such as fire, internal missiles, or pipe break. The new fuel storage racks are designed for the following loads and combinations thereof: dead loads, live loads (fuel assemblies), crane uplift load (up to 5000 pounds), SSE loads and operating basis earthquake (OBE) loads. The new fuel storage racks are designed to seismic Category I criteria, and are anchored to the seismic Category I floor and walls of the NFSF.

The new fuel is stored in an enclosed vault with reinforced concrete walls and a steel plate top. Hinged covers are provided directly over each fuel storage position. The covers and fuel racks are sized to prevent

insertion of a fuel assembly into other than its prescribed location. The steel protective cover protects the storage racks from possible dropped objects and has been determined capable of sustaining the maximum fuel assembly drop. The new fuel storage racks, loaded with fuel, are designed to resist distortion or buckling. Drainage is provided to prevent accumulation of water within the NFSF.

New fuel shipping containers only carry two new fuel assemblies. The procedure used for new fuel receipt requires the use of the monorail auxiliary hoist on the cask handling crane for lifting operations. A special new fuel handling tool is required to be attached to the monorail auxiliary hoist to lift each fuel assembly from the shipping container. This new fuel handling tool can only be attached to the top nozzle of one fuel assembly at a time. The attached fuel assembly is moved to either the new fuel storage racks or the new fuel elevator if the assembly is going to be stored in the spent fuel facility. Both of these storage positions will only accommodate one fuel assembly in a designed location. Therefore, the design of the new fuel storage rack, the fuel handling equipment, and the administrative controls are such that subcriticality is assured under normal and accident conditions.

The spent fuel pool is divided into two separate and distinct regions, which for the purpose of criticality considerations may be considered as separate pools. Region I, reserved for core offloading and new fuel storage, has the capacity for a minimum of 200 assemblies. Wolf Creek Technical Specification 5.6.1.1.a limits the enrichment of new fuel to 4.45 w/o U-235. The spent fuel pool is designed to store fuel in a geometric array that precludes criticality (k_{eff} no greater than 0.95), even in the event of

complete loss of the soluble boron in the pool water. Fuel movements are procedurally controlled and designed to preclude conditions involving criticality concerns. Moreover, previous accident analyses have demonstrated that a fuel handling accident (i.e., a dropped fuel element) will not create conditions which exceed design specifications. In addition, the Technical Specifications and the Wolf Creek Final Safety Analysis Report specifically address the new fuel enrichment limits (4.45 w/o uranium-235), refueling operations and limit the handling of fuel to ensure against an accidental criticality and to preclude certain movements over the spent fuel pool and the reactor vessel.

Notwithstanding the fact that procedures and controls prevent an inadvertent criticality during fuel handling, area radiation monitors, as described in Section 12.3.4 of the Wolf Creek UFSAR, are located near the spent fuel pool, new fuel storage vault, and cask handling area. These monitors are provided in accordance with GDC 63 and 10 CFR 70.24 to serve as criticality alarm monitors, and they conform to the requirements of 10 CFR Part 70, Regulatory Guides 8.5 and 8.12, and Standards ANSI/ANS-8.3-1979 and USAS N2.3-1967. These monitors will remain in place and will continue to provide prompt warning of high radiation in the unlikely event of an inadvertent criticality accident.

Workers qualified to work in radiologically-controlled areas are trained, as part of Plant Access Training, to immediately evacuate an area in which an area radiation monitor is alarming and to notify the control room following evacuation. Personnel currently qualified to respond to potential fuel handling accidents receive additional training, which directs them to identify

the affected area, place fuel in a safe location, evacuate the affected area, and minimize the spread of airborne radiation.

In summary, the training provided to personnel involved in fuel handling operations, the design of the fuel handling equipment, the administrative controls, the technical specifications on new and spent fuel handling and storage and the design of the new and spent fuel storage racks preclude inadvertent or accidental criticality.

Based upon the information provided, there is reasonable assurance that irradiated and unirradiated fuel will remain subcritical. Furthermore, there is reasonable assurance that, should an inadvertent criticality occur, the licensee will detect such a criticality and workers will respond properly. Procedures, monitors, and training constitute good cause for granting an exemption to 10 CFR 70.24. In addition, the licensee has verified that a separate radiation monitoring system remains available to meet the requirements of 10 CFR Part 50, Appendix A, General Design Criterion 63, to detect excessive radiation levels and to initiate appropriate safety actions in fuel storage and handling areas. Therefore, the staff concludes that the licensee's request for an exemption from the requirements of 10 CFR 70.24 is acceptable and should be granted.

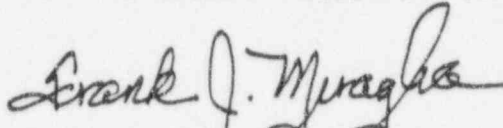
III.

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 Wolf Creek Nuclear Operating Corporation an exemption as described in Section II above from 10 CFR 70.24, "Criticality Accident Requirements."

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 9207).

This exemption is effective upon issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

A handwritten signature in cursive script, reading "Frank J. Miraglia".

Frank J. Miraglia, Acting Director
Office of Nuclear Reactor Regulation

Dated at Rockville, Maryland,
this 24th day of June 1997