

CATEGORY 1

REGULATORY INFORMATION DISTRIBUTION SYSTEM (RIDS)

ACCESSION NBR: 9705160219 DOC. DATE: 97/04/23 NOTARIZED: NO DOCKET #
 FACIL: 50-261 H.B. Robinson Plant, Unit 2, Carolina Power & Light C 05000261
 AUTH. NAME AUTHOR AFFILIATION
 WILKERSON, T.M. Carolina Power & Light Co.
 RECIP. NAME RECIPIENT AFFILIATION
 Office of Nuclear Material Safety & Safeguards

SUBJECT: Forwards request for exemption from provisions of
 10CFR70.24(a) that require criticality monitoring & alarm
 sys in areas where specified amounts of special nuclear
 materials are stored.

DISTRIBUTION CODE: A001D COPIES RECEIVED: LTR 1 ENCL 1 SIZE: 6
 TITLE: OR Submittal: General Distribution

NOTES:

RECIPIENT ID CODE/NAME	COPIES	RECIPIENT ID CODE/NAME	COPIES
	LTTR ENCL		LTTR ENCL
PD2-1 LA	1 1	PD2-1 PD	1 1
MOZAFARI, B	1 1		
INTERNAL: <u>FILE CENTER-01</u>	1 1	NRR/DE/ECGB/A	1 1
NRR/DE/EMCB	1 1	NRR/DRCH/HICB	1 1
NRR/DSSA/SPLB	1 1	NRR/DSSA/SRXB	1 1
NUDOCS-ABSTRACT	1 1	OGC/HDS3	1 0
EXTERNAL: NOAC	1 1	NRC PDR	1 1

C
A
T
E
G
O
R
Y

1

D
O
C
U
M
E
N
T

NOTE TO ALL "RIDS" RECIPIENTS:

PLEASE HELP US TO REDUCE WASTE. TO HAVE YOUR NAME OR ORGANIZATION REMOVED FROM DISTRIBUTION LISTS
 OR REDUCE THE NUMBER OF COPIES RECEIVED BY YOU OR YOUR ORGANIZATION, CONTACT THE DOCUMENT CONTROL
 DESK (DCD) ON EXTENSION 415-2083

TOTAL NUMBER OF COPIES REQUIRED: LTTR 13 ENCL 12



Carolina Power & Light Company
Robinson Nuclear Plant
3581 West Entrance Road
Hartsville SC 29550

Robinson File No: 13510
Serial: RNP-RA/97-0052

APR 23 1997

Director, Office of Nuclear Material Safety and Safeguards
United States Nuclear Regulatory Commission
Washington, D.C. 20555

H. B. ROBINSON STEAM ELECTRIC PLANT, UNIT NO. 2
DOCKET NO. 50-261/LICENSE NO. DPR-23
REQUEST FOR EXEMPTION FROM THE REQUIREMENTS OF 10 CFR 70.24(a)

Gentlemen:

The purpose of this letter is to transmit the attached request for exemption from the provisions of 10 CFR 70.24(a) that require a criticality monitoring and alarm system and implementation of emergency procedures, including evacuation drills, in areas where specified amounts of special nuclear materials are stored. This exemption request has been prepared in accordance with 10 CFR 10.14(a) and 70.24(d).

If you have any questions concerning this matter, please contact me or Mr. H. K. Chernoff of my staff at (803) 857-1437.

Very truly yours,

Terry M. Wilkerson

T. M. Wilkerson
Manager - Regulatory Affairs

1/1
A001

HKC/hkc
Attachment

c: Mr. L. A. Reyes, Regional Administrator, USNRC, Region II
Ms. B. L. Mozafari, USNRC Project Manager, HBRSEP
Mr. B. B. Desai, USNRC Senior Resident Inspector, HBRSEP

9705160219 970423
PDR ADOCK 05000261
P PDR

1600



H. B. ROBINSON STEAM ELECTRIC PLANT, UNIT NO. 2 REQUEST FOR EXEMPTION FROM THE PROVISIONS OF 10 CFR 70.24(a)

REGULATORY REQUIREMENT FROM WHICH EXEMPTION IS REQUESTED

Carolina Power & Light (CP&L) Company requests an exemption from the requirements of 10 CFR 70.24(a) for the H. B. Robinson Steam Electric Plant (HBRSEP), Unit No. 2. The provisions of 10 CFR 70.24, "Criticality accident requirements," section (a), require, in part, that licensees authorized to possess special nuclear material (SNM) in excess of specified quantities, shall maintain a monitoring system in areas where the special nuclear material is handled, used, or stored, that will energize a clearly audible alarm if accidental criticality occurs. The regulation further requires that licensees maintain emergency procedures for each area where special nuclear material is handled, used, or stored to ensure that personnel withdraw to an area of safety upon sounding of these alarms. The procedures shall include the conduct of drills to familiarize personnel with the evacuation plan, and designation of responsible individuals for determining the cause of the alarms and placement of radiation survey instruments in accessible locations for use in such an emergency.

The provisions of 10 CFR 70.24(a) are applicable to the new fuel storage structure, spent fuel pool, and areas used for handling SNM in the vicinity of these areas. Special nuclear material is also present at HBRSEP, Unit No. 2 in the form of incore detectors and calibration sources; however, the amount of this material is below the quantities specified in 10 CFR 70.24(a).

REGULATORY PROCESS FOR EXEMPTION

10 CFR 70.24(d) anticipates that relief from the requirements of 10 CFR 70.24(a) may be appropriate in some circumstances and allows licensees to apply for an exemption from 10 CFR 70.24 if good cause is shown. Good cause for exemption from 10 CFR 70.24(a) exists based on the following: (i) the use, storage, and handling of SNM is controlled by a combination of physical and administrative measures, including Technical Specifications requirements, that serve to preclude conditions that could result in accidental criticality; and (ii) compliance with 10 CFR 70.24(a) will not serve the underlying purpose of the regulation.

In addition to the provisions of 10 CFR 70.24(d), this exemption request meets the requirements of 10 CFR 70.14(a). 10 CFR 70.14(a) stipulates that the NRC is authorized to grant an exemption from regulations in 10 CFR 70 provided the proposed exemption: (i) is authorized by law; (ii) does not endanger life or property or the common defense and security; and (iii) is in the public interest.

The following sections provide the basis for the determination that this exemption request meets the criteria stipulated in 10 CFR 70.24(d) and 10 CFR 70.14(a).

GOOD CAUSE EXISTS

This standard is reasonably evaluated with consideration of the guidance provided in Regulatory Guide (RG) 8.12, dated October 1, 1988. RG 8.12 states that the guidance of ANSI/ANS 8.3-1986, "Criticality Accident Alarm Systems," is generally acceptable subject to limitations described in RG 8.12. RG 8.12 Regulatory Position C.1. states in part that if an evaluation has determined that there is not a potential for criticality in areas where SNM is handled, used, or stored then it is appropriate to request an exemption from 10 CFR 70.24. Examples stipulated in RG 8.12 are, "where 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."

The following sections describe the areas where 10 CFR 70.24 quantities of SNM are handled, used, and stored at HBRSEP.

Handling of 10 CFR 70.24 Quantities of SNM

Unirradiated fuel is handled in the vicinity of the new fuel storage structure and the spent fuel pool; within the new fuel storage structure; within the spent fuel pool; and between the spent fuel pool and reactor vessel. Unirradiated fuel handling activities are performed as needed to support fuel receipt inspections and refueling operations. Irradiated fuel is handled within the spent fuel pool; between the spent fuel pool and reactor vessel; and within an NRC licensed cask in the vicinity of the spent fuel pool. Irradiated fuel handling activities are accomplished as necessary to support refueling operations and the transfer of spent fuel to other storage facilities.

Fuel movements are administratively controlled by procedures and Technical Specifications requirements. These controls include but are not limited to the following: (i) detailed instructions for the control of fuel movements; (ii) minimum boron concentration in water filling the spent fuel pool and reactor vessel; (iii) continuous monitoring of subcritical neutron flux during reactor vessel core geometry changes; and (iv) restrictions on the spent fuel cask handling crane. These measures are designed in conjunction with physical controls to preclude conditions that could result in accidental criticality. Additionally, accident analyses have concluded that a credible fuel handling accident will not result in accidental criticality.

Use of 10 CFR 70.24 Quantities of SNM

As previously described, 10 CFR 70.24 quantities of SNM at HBRSEP exist in the form of irradiated and unirradiated fuel. Criticality control of SNM while in use in the reactor vessel is accomplished by a combination of physical geometry, control rods, chemical shim (i. e., boron concentration), temperature control, and flux monitoring instrumentation. The potential for accidental criticality is precluded by compliance with administrative controls reflecting Technical Specifications requirements on shutdown margin, control rod movement, boron concentration, temperature control, and flux monitoring instrumentation.

Storage of 10 CFR 70.24 Quantities of SNM

Unirradiated fuel is stored in either the new fuel storage structure or the spent fuel pool. The new fuel storage structure may be used to facilitate the receipt and unloading of new fuel assemblies from new fuel shipping containers. This structure is a vault containing racks specifically designed for the storage of new fuel assemblies. The new fuel storage structure is located in the Fuel Handling Building at elevation 226 feet. An area plan drawing illustrating the location of the structure is provided in the Updated Final Safety Analysis Report in Figure 1.2.2-7. The new fuel storage racks within the structure were originally designed to store 105 new fuel assemblies with a maximum enrichment of 3.5 weight percent of Uranium 235 in a vertical array in a dry environment. The design of the racks provided a nominal 21 inch center-to-center distance between fuel assemblies in a 10 x 11 square-pitched array while prohibiting insertion of fuel assemblies in other than prescribed locations. The eleventh row has only 5 storage locations.

As the allowable enrichment of fuel used in the reactor has increased to a nominal maximum of 4.95 weight percent of Uranium 235, additional separation in the new fuel storage racks was required, and is maintained by the use of secured locations. Insertion of fuel into secured locations is prohibited by the use of chains and padlocks installed under administrative control. Thirty-three storage locations are secured in accordance with Technical Specifications Section 5.4.2.1, "New Fuel Storage Racks," reducing the storage capacity to 72 new fuel assemblies. This geometry ensures that the higher enriched fuel maintains a k_{eff} less than 0.95 assuming that the new fuel storage racks are flooded with unborated water; and maintains a k_{eff} less than 0.98 in an optimum moderation event.

The spent fuel pool is used to facilitate unirradiated and irradiated fuel storage; refueling operations; and the loading of NRC licensed casks. This structure is a borated water filled pool containing racks specifically designed for the storage of fuel assemblies. The spent fuel pool is located in the Fuel Handling Building with a bottom elevation of 236.75 feet. An area plan drawing illustrating the location of the spent fuel pool is provided in the Updated Final Safety Analysis Report in Figure 1.2.2-7. The spent fuel pool was originally designed with spent fuel racks that would accommodate 240 fuel assemblies with a center-to-center spacing of 21 inches. The spent fuel pool currently contains a combination of low-density and high-density fuel storage racks to accommodate 544 fuel assemblies in a vertical array in a borated water environment. The storage racks were designed so that it is not possible to insert assemblies in other than designated fuel cell locations. The low-density racks provide storage space for 176 fuel assemblies with a center-to-center distance of 21 inches. The high density racks provide cell locations for 368 assemblies with a center-to-center distance of 10.5 inches. The center-to-center spacing between low-density and high-density cells is either 14.75 or 15.75 inches with a neutron absorbing material between the cells. The effective neutron multiplication factor, k_{eff} , was calculated for the most conservative conditions of temperature, fuel enrichment, geometry, structural poisoning and other parameters. For both the high and low-density spent fuel racks a nominal maximum of 4.95 weight percent of Uranium 235 was assumed. The calculation confirmed that k_{eff} is maintained less than 0.95.

In addition, gamma radiation is continuously monitored in the auxiliary building. A high level signal is alarmed locally and is annunciated in the control room.

Summary

As described above, the handling, use, and storage, of 10 CFR 70.24 quantities of SNM is controlled by a combination of physical and administrative measures, including Technical Specifications requirements, that serve to preclude conditions that could result in accidental criticality.

COMPLIANCE WILL NOT SERVE THE UNDERLYING PURPOSE OF THE REGULATION

The underlying purpose of the regulation can be derived from two sources. First, the Atomic Energy Commission stated in part that 10 CFR 70.24 was, "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" (23 FR 8747). Secondly, the previously cited RG 8.12 states that exemption requests from 10 CFR 70.24 would be appropriate if an evaluation determines that no potential for criticality exists. Additionally, RG 8.12 uses a condition, "where geometric spacing is used to preclude criticality, " as an example of a condition appropriate for an exemption request. From these two sources it can be derived that the regulation was promulgated to ensure that licensees are notified of, and take appropriate actions in response to conditions involving accidental criticality. It also seems clear that the Nuclear Regulatory Commission guidance acknowledges that where physical and/or procedural controls are in place to preclude accidental criticality, the underlying purpose of the regulation is not served by implementation of the additional requirements of the regulation.

As previously described, HBRSEP has established appropriate combinations of physical and administrative controls, including Technical Specifications requirements, to preclude accidental criticality as a result of the handling, use, and storage of 10 CFR 70.24 quantities of SNM. Therefore, it can be concluded that compliance is not necessary to serve the underlying purpose of the rule.

AUTHORIZED BY LAW

The NRC's authority to grant exemptions from its regulations has existed since 1956. The particular authority to grant exemptions from the requirements of 10 CFR 70 was codified in 10 CFR 70.14 in 1972 (37 FR 5745-5749). Further, 10 CFR 70.24(d) states that the NRC has specific authority to exempt licensees from the requirements of 10 CFR 70.24. Therefore, it can be concluded that the NRC clearly has the authority to grant exemptions as stipulated in the referenced regulations.

DOES NOT ENDANGER LIFE OR PROPERTY OR THE COMMON DEFENSE AND SECURITY

The exemption will not change the currently employed means of storage, handling or use of special nuclear material at HBRSEP. The exemption will allow possession of special nuclear material without the installation and maintenance of a criticality monitoring and alarm system and other measures required by 10 CFR 70.24(a). The utilization of the special nuclear material will continue to be accomplished safely with alternative measures in place that serve to preclude accidental criticality, and thus obviate a criticality monitoring and alarm system.

Approval of the exemption request will not result in changes in operations that would endanger life or property or the common defense and security. Existing physical and administrative controls appropriately implement the regulatory requirements for the protection of the health and safety of the public and measures to prevent the loss or diversion of SNM.

OTHERWISE IN THE PUBLIC INTEREST

Although the NRC does not provide specific guidance for measuring this criterion, a 1985 amendment to 10 CFR 50.12(a) (50 FR 50764) which replaced the "public interest" criterion with examples of "special circumstances" provides a reasonable measure of NRC intent in this area. When 10 CFR 50.12(a) was revised, the NRC stated, in part, that it had considered the need to revise other regulations to conform with the criteria in 10 CFR 50.12(a) and concluded that since the majority of exemption requests pertain to 10 CFR 50 revisions to other regulations were not necessary. Therefore it is apparent that use of the "special circumstances" criteria of 10 CFR 50.12(a) is a reasonable measure of the "public interest" criterion in 10 CFR 70.14(a).

The above discussions have delineated that implementation of the requirements of 10 CFR 70.24(a) is not necessary to serve the underlying purpose of the rule. 10 CFR 50.12(a)(2)(ii) states as an example of "special circumstances" that, "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." Further 10 CFR 50.12(a)(2)(iii) states, in part, as another example of "special circumstances" that, "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...". Compliance with 10 CFR 70.24(a) would involve significant capital expenditure for the installation of criticality alarm and monitoring systems, as well as the operation and maintenance costs associated with the installed equipment and implementation of emergency procedures, including periodic drills. In addition the NRC has consistently granted exemptions of this type to other licensees.

Based on the preceding discussion, it can be concluded that the proposed exemption from the requirements of 10 CFR 70.24(a) meets the criterion of "otherwise in the public interest."

CONCLUSION

As delineated in this Attachment, it has been concluded the proposed exemption from the requirements of 10 CFR 70.24(a) meets the standards of both 10 CFR 70.14(a). Specifically, good cause for exemption from 10 CFR 70.24(a) exists based on the following: (i) the use, storage, and handling of SNM is controlled by a combination of physical and administrative measures, including Technical Specifications requirements, that serve to preclude conditions that could result in accidental criticality; and (ii) compliance with 10 CFR 70.24(a) will not serve the underlying purpose of the regulation. Additionally, in accordance with the requirements of 10 CFR 70.14(a) it has been determined that the proposed exemption: (i) is authorized by law; (ii) does not endanger life or property or the common defense and security; and (iii) is in the public interest. Therefore, the requested exemption should be granted by the NRC.