Mr. Joseph J. Hagan
Vice President, Operations GGNS
Entergy Operations, Inc.
P. O. Box 756
Port Gibson, MS 39150

exemption granted
w. Memo on
9/18/97

SUBJECT: EXEMPTION FROM CRITICALITY ACCIDENT REQUIREMENTS IN 10 CFR 70.24(a) - GRAND GULF NUCLEAR STATION, UNIT 1 (TAC NO. M96177)

#10

Dear Mr. Hagan:

The enclosed exemption, as requested in your application dated July 15, 1996, (GNRO-96/00082), and supplemented by letters dated March 7 and April 29, 1997, (GNRO-97/00021 and 00035), is from the criticality monitoring requirements of 10 CFR 70.24(a), "Criticality Accident Requirements." The exemption concerns the storage of special nuclear material (SNM) in the form of (1) in-core nuclear instrumentation (e.g., source range monitors) when not in use and (2) unirradiated fuel. For unirradiated fuel, the exemption was requested for unirradiated fuel that is packaged in accordance with 10 CFR Part 71, "Packaging and Transportation of Radioactive Material," while the fuel is taken from the shipping trucks to the spent fuel pool area to be removed from the packaging, and for unirradiated fuel that is stored in the new fuel vault (NFV). For this exemption, you have committed to have (1) the total quantity of SNM present in the nuclear instrumentation less than a critical mass and (2) the unirradiated fuel is only removed from the Part 71 packaging in areas where a criticality accident monitor system is in use. As stated in the letter dated March 7, 1997, you have administrative controls to prevent optimum moderation of the unirradiated fuel in the NFV.

The Commission has granted this Exemption pursuant to 10 CFR 70.14. A copy of the Exemption is being forwarded to the Office of the Federal Register for publication. In granting this exemption, the staff is relying on the above two commitments.

Sincerely, 10/31/97

Jack N. Donohew, Senior Project Manager
Project Directorate IV-1
Division of Reactor Projects III/IV
Office of Nuclear Reactor Regulation

Docket No. 50-416

DISTRIBUTION: See next page

Enclosure: Exemption

cc w/encl: See next page

*See previous concurrence

Document Name: GG96177.EXE

SRXB Memo dated: March 11, 1997

#76

OFFICE	PM/PDIV-1	LA/PDIV-1	OGC*	(A)D/PDIV-1	D/DRPW	SRXB:DSSA
NAME	JDonohew/sp	CHawes CMH	APH	JClifford	JRoe	TCollins
DATE	9/17/97	9/17/97	07/30/97	9/18/97	9/25/97	10/06/97
COPY	YES/NO	YES/NO	YES/NO	YES/NO	YES/NO	

OFFICE	D/NMSS/FCSS	D/ADRP	D/NRR
NAME	ETen Eyck	RZimmerman	SCollins
DATE	/97	10/20/97	10/30/97
COPY	YES/NO	YES/NO KD	YES/NO

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Concurrence not needed JNDonohew 9/26/97

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

October 31, 1997

Mr. Joseph J. Hagan
Vice President, Operations GGNS
Entergy Operations, Inc.
P. O. Box 756
Port Gibson, MS 39150

SUBJECT: EXEMPTION FROM CRITICALITY ACCIDENT REQUIREMENTS IN 10 CFR 70.24(a) - GRAND GULF NUCLEAR STATION, UNIT 1 (TAC NO. M96177)

Dear Mr. Hagan:

The enclosed exemption, as requested in your application dated July 15, 1996, (GNRO-96/00082), and supplemented by letters dated March 7 and April 29, 1997, (GNRO-97/00021 and 00035), is from the criticality monitoring requirements of 10 CFR 70.24(a), "Criticality Accident Requirements." The exemption concerns the storage of special nuclear material (SNM) in the form of (1) in-core nuclear instrumentation (e.g., source range monitors) when not in use and (2) unirradiated fuel. For unirradiated fuel, the exemption was requested for unirradiated fuel that is packaged in accordance with 10 CFR Part 71, "Packaging and Transportation of Radioactive Material," while the fuel is taken from the shipping trucks to the spent fuel pool area to be removed from the packaging, and for unirradiated fuel that is stored in the new fuel vault (NFV). For this exemption, you have committed to have (1) the total quantity of SNM present in the nuclear instrumentation less than a critical mass and (2) the unirradiated fuel is only removed from the Part 71 packaging in areas where a criticality accident monitor system is in use. As stated in the letter dated March 7, 1997, you have administrative controls to prevent optimum moderation of the unirradiated fuel in the NFV.

The Commission has granted this Exemption pursuant to 10 CFR 70.14. A copy of the Exemption is being forwarded to the Office of the Federal Register for publication. In granting this exemption, the staff is relying on the above two commitments.

Sincerely,

Jack N. Donohew, Senior Project Manager
Project Directorate IV-1
Division of Reactor Projects III/IV
Office of Nuclear Reactor Regulation

Docket No. 50-416

Enclosure: Exemption

cc w/encl: See next page

cc:

Executive Vice President
& Chief Operating Officer
Entergy Operations, Inc.
P. O. Box 31995
Jackson, MS 39286-1995

Wise, Carter, Child & Caraway
P. O. Box 651
Jackson, MS 39205

Winston & Strawn
1400 L Street, N.W. - 12th Floor
Washington, DC 20005-3502

Director
Division of Solid Waste Management
Mississippi Department of Natural
Resources
P. O. Box 10385
Jackson, MS 39209

President,
Claiborne County Board of Supervisors
Port Gibson, MS 39150

Regional Administrator, Region IV
U.S. Nuclear Regulatory Commission
611 Ryan Plaza Drive, Suite 1000
Arlington, TX 76011

Senior Resident Inspector
U. S. Nuclear Regulatory Commission
Route 2, Box 399
Port Gibson, MS 39150

Manager of Operations
Bechtel Power Corporation
P.O. Box 2166
Houston, TX 77252-2166

General Manager, GGNS
Entergy Operations, Inc.
P. O. Box 756
Port Gibson, MS 39150

Attorney General
Department of Justice
State of Louisiana
P. O. Box 94005
Baton Rouge, LA 70804-9005

State Health Officer
State Board of Health
P. O. Box 1700
Jackson, MS 39205

Office of the Governor
State of Mississippi
Jackson, MS 39201

Attorney General
Asst. Attorney General
State of Mississippi
P. O. Box 22947
Jackson, MS 39225

Vice President, Operations Support
Entergy Operations, Inc.
P.O. Box 31995
Jackson, MS 39286-1995

Director, Nuclear Safety
and Regulatory Affairs
Entergy Operations, Inc.
P.O. Box 756
Port Gibson, MS 39150

7590-01-P

UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

In the Matter of ENTERGY OPERATIONS, INC. SYSTEM ENERGY RESOURCES, INC. SOUTH MISSISSIPPI ELECTRIC POWER ASSOCIATION ENTERGY MISSISSIPPI, INC. (Grand Gulf Nuclear Station, Unit 1)	)	Docket No. 50-416

EXEMPTION

I.

Entergy Operations, Inc. (the licensee) is the holder of Facility Operating License No. NPF-29, which authorizes operation of Grand Gulf Nuclear Station, Unit 1 (GGNS). The operating license provides, among other things, that the licensee is subject to all rules, regulations, and orders of the Nuclear Regulatory Commission (NRC or the Commission) now and hereafter in effect.

The facility is a General Electric boiling water reactor at the licensee's site in Claiborne County, Mississippi.

II.

Title 10 CFR 70.24, "Criticality Accident Requirements," paragraph (a) states, in part, that "Each licensee authorized to possess special nuclear material [SNM] in a quantity exceeding 700 grams of contained uranium-235, 520 grams of contained uranium-233, 450 grams of plutonium, 1,500 grams of

contained uranium-235 if no uranium enriched to more than 4 percent by weight of uranium-235 is present, 450 grams of any combination thereof, or one-half such quantities if massive moderators or reflectors made of graphite, heavy water or beryllium may be present, shall maintain in each area in which such licensed special nuclear material is handled, used, or stored, a monitoring system meeting the requirements of [10 CFR 70.24](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. This section is not intended to require underwater monitoring when special nuclear material is handled or stored beneath water shielding or to require monitoring systems when special nuclear material is being transported when packaged in accordance with the requirements of Part 71 [(i.e., 10 CFR Part 71, "Packaging and Transportation of Radioactive Material,")] of this chapter."

The licensee exceeds the quantity criteria in 10 CFR 70.24(a) and is, therefore, required to have a criticality accident monitoring system in each area in which SNM in any form is handled, used, or stored. The licensee has proposed an exemption to this requirement for the storage of two forms of SNM at the site: (1) not-in-use in-core nuclear instrumentation (e.g., source range monitors, [illegible]) onsite unirradiated fuel. For the unirradiated fuel, the exemption is requested for the following cases:

- The interval when the fuel, packaged for shipment to the site in accordance with 10 CFR Part 71, is taken from the shipping truck to the plant area where the Part 71 packaging is removed.

- The storage of the unirradiated fuel in the new fuel vault (NFV), instead of the spent fuel pool, after the packaging is removed.

The very small quantity of SNM present in the nuclear instrumentation is in the form of thin coatings within the instrumentation and the unirradiated fuel assemblies would only be removed from the NRC-approved packaging in areas where criticality monitors are in use, and stored in either the NFV or the spent fuel pool. The unirradiated fuel that is stored in the spent fuel pool would be monitored in accordance with 10 CFR 70.24(a), whereas there is not a criticality accident monitor in the NFV.

An exemption from 10 CFR 70.24(a) is required for the licensee to store SNM at the site and not have a criticality accident monitoring system for the storage areas.

III.

Pursuant to 10 CFR 70.14, "Specific exemptions," the Commission may, upon application of any interested person or upon its own initiative, grant such exemptions 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.

Pursuant to 10 CFR 70.24(d), any licensee who believes that good cause exists why it should be granted an exemption in whole or in part from the requirements of this section may apply to the Commission for such an exemption. Such application shall specify the reason for the relief requested.

By letter dated July 15, 1996, as supplemented by letters dated March 7 and April 29, 1997, the licensee requested an exemption from the monitoring requirements of 10 CFR 70.24(a) for the storage of these two forms of SNM at the site. In those letters, the licensee provided the justification and reasons for requesting the exemption. The licensee did not request an exemption to the performance requirements of a criticality accident monitoring system that are specified in 10 CFR 70.24(a)(1) or (a)(2).

A previous exemption from the provisions of 10 CFR 70.24 for the storage of SNM was granted for GGNS in the July 15, 1981, SNM License No. 1882. This exemption expired with the SNM license when the operating license was issued for GGNS because the exemption was not reissued at that time. Therefore, the licensee has requested an exemption from the criticality accident monitoring requirements of 10 CFR 70.24(a) specifically for the areas containing in-core instrumentation detectors (which are not in use) and unirradiated (fresh) fuel. For unirradiated fuel, the exemption is requested for the unirradiated fuel that is in NRC-approved packaging while the fuel is taken from the shipping trucks to the spent fuel pool area to be removed from the packaging, and for the unirradiated fuel that is stored in the NFV, instead of the spent fuel pool.

The principal form of SNM at GGNS is in the form of nuclear fuel. Other quantities of SNM are also used or stored at the facility in the form of fissile material incorporated into in-core nuclear instrumentation (e.g., source range monitors, intermediate range monitors, local power range monitors, and traversing in-core probes). The instrumentation is being stored

at the site within the security fence in different plant areas.

The SNM in the nuclear instrumentation is in small quantities in thin coatings applied to the inside of sealed fission chambers contained within the instruments. The licensee has stated that the total amount of SNM contained in the nuclear instruments meets the "forms not sufficient to form a critical mass" in Section 1.1 of Regulatory Guide 10.3, "Guide for the Preparation of Applications for Special Nuclear Material Licenses of Less Than Critical Mass Quantities," Revision 1, dated April 1977. Thus, the licensee has committed that the total amount of SNM contained within in-core nuclear instrumentation will be less than a critical mass. Therefore, the small quantity of SNM in the nuclear instrumentation precludes inadvertent criticality.

Unirradiated nuclear fuel is received at the site only in NRC-approved Part 71 packaging. The entire Part 71 packaging consists of two right rectangular boxes consisting of an outer wooden container surrounding a inner metal container housing the unirradiated fuel. There is only cushioning material between the two boxes. The containers are designed in accordance with a certificate of compliance for radioactive materials packages issued by the NRC, in this case for the shipment of unirradiated fuel assemblies. It is the inner metal container that ensures that a geometrically safe configuration of the fuel is maintained during transport, handling, storage, and accident conditions, and that the introduction of any moderating agents to the fuel is precluded due to its leak-tight construction. Criticality is precluded due to the construction of the package and the storage configuration of the fuel in the package. This is based on a criticality analysis of the Part 71 packaging which limits the number of such packages on a shipping truck.

The handling of unirradiated fuel at the site is governed by administrative and departmental procedures that specify New Fuel Processing and Criticality Rules to ensure that fuel is not inadvertently removed from the inner metal container until it is positioned in the fuel inspection area near the spent fuel pool of the auxiliary building where a criticality accident monitoring system meeting 70.24(a) is present. It is the metal container that is referred to when the licensee stated that the unirradiated fuel will only be removed from the NRC-approved packaging in the presence of a criticality accident monitoring system meeting 70.24(a).

The unirradiated fuel is brought onsite on shipping trucks. The wooden containers are removed from the inner metal containers, and the unirradiated fuel is lifted in the metal container to the 208-foot level of the auxiliary building, and adjacent to the cask washdown pit and NFV of the spent fuel pool area. Only one metal container is lifted at a time, and the crane and lifting equipment used for the lift are certified. The plant areas that the metal containers would be moved through were inspected during a visit to the site and it was determined that the areas have drains to prevent the possibility of submerging the metal containers under water and creating a possible criticality condition. The only practical plant area where the new fuel could be submerged in water to introduce moderation is the spent fuel pool and there are 70.24(a) monitors in that area.

In the spent fuel pool area, the fuel is removed from the containers, inspected and channeled, and then placed either in the spent fuel pool or the NFV. Currently the unirradiated fuel is placed only in the spent fuel pool and, while the fuel is in the spent fuel pool, it is monitored by a 70.24(a)

monitoring system; however unirradiated fuel may be stored inside the NFV and there is not a criticality accident monitor in the NFV. The design basis criticality margin requirements for the NFV is to maintain the unirradiated fuel in the vault at a subcriticality margin of at least 0.05 (i.e., a k effective no more than 0.95). The new fuel would be stored in racks that are designed to withstand all credible static and dynamic loadings to prevent damage and distortion of the racks, and to maintain the design subcriticality margin of 0.05 whether the vault is dry or flooded with unborated water, because unborated water would moderate the fuel and reduce the subcriticality margin. The racks are constructed in accordance with the quality assurance requirements of Appendix B to 10 CFR Part 50 and are categorized as Safety Class 2 and Seismic Category I. The vault is in a concrete, Seismic Category I building that is designed to Regulatory Guides 1.13 and 1.29 which precludes the deleterious effects on the fuel in the NFV by natural phenomena such as earthquakes, tornados, hurricanes, tornado missiles, and floods. To prevent water moderation, there is a drain at the low point of the vault to remove water in the vault to prevent accumulation of water within the NFV and no fuel is placed in the vault if there is water in the vault. The licensee also has procedures to prevent the introduction of an optimum moderation inside the vault (e.g., using pressurized water fire extinguishers instead of foam for combating fires around fuel) which could decrease the subcriticality margin to a value greater than the design value of 0.05. Although the Technical Specifications for Grand Gulf do not specifically limit the enrichment of the fuel onsite including the NFV, the k-effective for spent fuel or new fuel in the fuel racks and submerged in water is limited to 0.95 by the Technical

Specifications and the enrichment of the fuel onsite is limited because the k-effective for the NFV is not allowed to be greater than 0.95. The fuel enrichment is a contributor to the value of k-effective. Therefore, the design of the NFV will preclude inadvertent criticality of the new fuel in the vault.

Therefore, based on the licensee's letters and the staff's evaluation, the Commission concludes that good cause exists for granting an exemption to the criticality monitoring requirements of 10 CFR 70.24(a) in storage areas for (1) in-core instrumentation detectors which are not in use and (2) unirradiated fuel stored in the NFV. Based on the information provided by the licensee, there is reasonable assurance that the nuclear instrumentation and unirradiated fuel will remain subcritical during handling and storage in areas where critically accident monitors required by 10 CFR 70.24(a) are not present. Additionally, all fuel storage and handling areas will continue to be monitored to detect conditions that may result in excessive radiation levels as required by General Design Criterion 63.

IV.

For the foregoing reasons, pursuant to 10 CFR 70.24(d), the NRC staff has determined that good cause has been shown for granting an exemption to the criticality monitoring requirements of 10 CFR 70.24(a).

Accordingly, the Commission has determined that, pursuant to 10 CFR 70.14, an exemption is authorized by law, will not endanger life or property or common defense and security, and is otherwise in the public interest. Therefore, with the total amount of SNM contained in the in-core

nuclear instruments less than a critical mass, as defined by Section 1.1 of Regulatory Guide 10.3 (Revision 1, dated April 1977), with the unirradiated fuel assemblies only removed from the NRC-approved metal containers in areas where criticality monitors are present, and with administrative controls to prevent optimum moderation of the unirradiated fuel in the NFV, the Commission hereby grants Entergy Operations, Inc. an exemption from the criticality monitoring requirements of 10 CFR 70.24(a) for the storage of not-in-use in-core nuclear instrumentation and of unirradiated fuel in the NFV.

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 (62 FR 55837). This exemption is effective upon issuance.

Dated at Rockville, Maryland, this 31st day of October 1997.

FOR THE NUCLEAR REGULATORY COMMISSION

Samuel J. Collins, Director
Office of Nuclear Reactor Regulation

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

January 30, 1998

Mr. George A. Hunger, Jr.
Director-Licensing, MC 62A-1
PECO Energy Company
Nuclear Group Headquarters
Correspondence Control Desk
P.O. Box No. 195
Wayne, PA 19087-0195

SUBJECT: ISSUANCE OF EXEMPTION FROM THE REQUIREMENTS OF 10 CFR 70.24, LIMERICK GENERATING STATION, UNIT 1 (TAC NO. MA0327)

Dear Mr. Hunger:

By letter dated December 23, 1997, the Philadelphia Electric Company requested an exemption from certain requirements of 10 CFR 70.24 concerning criticality monitors.

Based upon the information provided, there is reasonable assurance that irradiated and unirradiated fuel will remain subcritical; furthermore, you maintain radiation monitors in accordance with General Design Criterion (GDC) 63. The low probability of a criticality together with your adherence to GDC 63 constitutes good cause for granting an exemption from 10 CFR 70.24(a).

The U.S. Nuclear Regulatory Commission, pursuant to 10 CFR 70.14, has issued the enclosed exemption for Limerick Generating Station, Unit 1. A copy of the exemption is being forwarded to the Office of Federal Register for publication.

This completes our effort on this issue and we are, therefore, closing out TAC No. MA0327.

Sincerely,

Bartholomew C. Buckley

Bartholomew C. Buckley, Senior Project Manager
Project Directorate I-2
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Docket No. 50-352

Enclosure: Exemption

cc w/encl: See next page

cc:

J. W. Durham, Sr., Esquire
Sr. V.P. & General Counsel
PECO Energy Company
2301 Market Street
Philadelphia, PA 19101

Manager-Limerick Licensing, 62A-1
PECO Energy Company
965 Chesterbrook Boulevard
Wayne, PA 19087-5691

Mr. Walter G. MacFarland, Vice President
Limerick Generating Station
Post Office Box A
Sanatoga, PA 19464

Plant Manager
Limerick Generating Station
P.O. Box A
Sanatoga, PA 19464

Regional Administrator, Region I
U.S. Nuclear Regulatory Commission
475 Allendale Road
King of Prussia, PA 19406

Senior Resident Inspector
U.S. Nuclear Regulatory Commission
Limerick Generating Station
P.O. Box 596
Pottstown, PA 19464

Director-Site Support Services
Limerick Generating Station
P.O. Box A
Sanatoga, PA 19464

Chairman
Board of Supervisors
of Limerick Township
646 West Ridge Pike
Linfield, PA 19468

Chief-Division of Nuclear Safety
PA Dept. of Environmental Resources
P.O. Box 8469
Harrisburg, PA 17105-8469

Director-Site Engineering
Limerick Generating Station
P.O. Box A
Sanatoga, PA 19464

Manager-Experience Assessment
Limerick Generating Station
P.O. Box A
Sanatoga, PA 19464

Library
U.S. Nuclear Regulatory Commission
Region I
475 Allendale Road
King of Prussia, PA 19406

Senior Manager-Operations
Limerick Generating Station
P.O. Box A
Sanatoga, PA 19464

Dr. Judith Johnsrud
National Energy Committee
Sierra Club
433 Orlando Avenue
State College, PA 16803

7590-01-P

UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

In the Matter of	)	
	)	
	)	
PHILADELPHIA ELECTRIC COMPANY	)	Docket No. 50-352
	)	
	)	
(Limerick Generating Station, Unit 1)	)	

EXEMPTION

I.

The Philadelphia Electric Company (the licensee) is the holder of Facility Operating License No. NPF-39, which authorizes operation of the Limerick Generating Station (LGS), Unit 1. 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.

The facility consists of two boiling-water reactors at the licensee's site located in Montgomery and Chester Counties, Pennsylvania.

II.

Section 70.24 of Title 10 of the CODE OF FEDERAL REGULATIONS, "Criticality Accident Requirements," requires that each licensee authorized to possess special nuclear material (SNM) shall maintain a criticality accident monitoring system in each area where such material is handled, used, or stored. Subsections (a)(1) and (a)(2) of 10 CFR 70.24 specify 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 SNM is handled, used, or stored and provides that (1) the procedures ensure that all personnel withdraw to an area of safety upon the sounding of a criticality accident monitor alarm, (2) the procedures must include drills to familiarize personnel with the evacuation plan, and (3) 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 SNM 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 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 SNM that could be assembled into a critical mass at LGS, Unit 1, is in the form of nuclear fuel; the quantity of SNM other than fuel that is stored on site in any given location 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 LGS, Unit 1, and has determined that it is extremely unlikely for such an accident to occur if the licensee meets the following seven criteria:

1. Only three new fuel assemblies are allowed out of a shipping cask or storage rack at one time.
2. The k-effective does not exceed 0.95, at a 95% probability, 95% confidence level in the event that the fresh fuel storage racks are filled with fuel of the maximum permissible U-235 enrichment and flooded with pure water.
3. If optimum moderation occurs at low moderator density, then the k-effective does not exceed 0.98, at a 95% probability, 95% confidence level in the event that the fresh fuel storage racks are filled with fuel of the maximum permissible U-235 enrichment and flooded with a moderator at the density corresponding to optimum moderation.
4. The k-effective does not exceed 0.95, at a 95% probability, 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 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 limited to 5.0 weight percent.

By letter dated December 23, 1997, the licensee requested an exemption from 10 CFR 70.24. In this request the licensee addressed the seven criteria given above. The Commission's technical staff has reviewed the licensee's submittals and has determined that LGS, Unit 1 meets the applicable criteria. Criteria 2 and 3 are not applicable to LGS, Unit 1 since it has no fresh

fuel strorage racks, for prevention of inadvertent criticality; therefore, the staff has determined that it is extremely unlikely for an inadvertent criticality to occur in SNM handling or storage areas at LGS, Unit 1.

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 SNM, personnel would be alerted to that fact and would take appropriate action. The staff has determined that it is extremely unlikely that such an accident could occur; furthermore, the licensee has radiation monitors, as required by General Design Criterion 63, in fuel storage and handling areas. These monitors will 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 General Design Criterion 63, constitutes good cause for granting an exemption to the requirements of 10 CFR 70.24(a).

IV.

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 the Philadelphia Electric Company, an exemption from the requirements of 10 CFR 70.24(a) for Limerick Generating Station, Unit 1.

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 4497).

This exemption is effective upon issuance.

Dated at Rockville, Maryland, this 30th day of January 1998.

FOR THE NUCLEAR REGULATORY COMMISSION

Samuel J. Collins, Director
Office of Nuclear Reactor Regulation

Mr. J.P. O'Hanlon
Senior Vice President - Nuclear
Virginia Electric and Power Company
Innsbrook Technical Center
5000 Dominion Blvd.
Glen Allen, Virginia 23060

August 21, 1997

SUBJECT: ISSUANCE OF EXEMPTION FROM THE REQUIREMENTS OF 10 CFR 70.24(a) - SURRY POWER STATION (TAC NOS. M97904 and M97905)

Dear Mr. O'Hanlon:

By letter dated January 28, 1997, as supplemented March 24, 1997, you requested an exemption from the requirements of 10 CFR 70.24(a) concerning criticality monitors as pertaining to unirradiated fuel and other forms of special nuclear materials.

Based upon the information provided, there is reasonable assurance that irradiated and unirradiated fuel will remain subcritical during handling and storage; furthermore, you maintain radiation monitors in accordance with General Design Criterion (GDC) 63. The low probability of a criticality together with your adherence to GDC 63 constitutes good cause for granting an exemption from 10 CFR 70.24(a).

The Commission, pursuant to 10 CFR 70.14, has issued the enclosed Exemption for Surry Nuclear Power Station, Unit 1 and Unit 2. The enclosed Safety Evaluation documents the NRC staff's review of this issue. The exemption is being forwarded to the Office of the Federal Register for publication.

Sincerely,

Original signed by:

Gordon Edison, Senior Project Manager
Project Directorate I-1
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Docket Nos. 50-280
and 50-281

Enclosures: 1. Exemption
2. Safety Evaluation

cc w/encl: See next page

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DATE	8/12/97		8/14/97		8/7/97		8/15/97	

Official Record Copy

Mr. J. P. O'Hanlon
Virginia Electric and Power Company

Surry Power Station

cc:
Mr. Michael W. Maupin, Esq.
Hunton and Williams
Riverfront Plaza, East Tower
951 E. Byrd Street
Richmond, Virginia 23219

Mr. David Christian, Manager
Surry Power Station
Virginia Electric and Power Company
5570 Hog Island Road
Surry, Virginia 23883

Senior Resident Inspector
Surry Power Station
U. S. Nuclear Regulatory Commission
5850 Hog Island Road
Surry, Virginia 23883

Chairman
Board of Supervisors of Surry County
Surry County Courthouse
Surry, Virginia 23683

Dr. W. T. Lough
Virginia State Corporation
Commission
Division of Energy Regulation
P. O. Box 1197
Richmond, Virginia 23209

Regional Administrator, Region II
U. S. Nuclear Regulatory Commission
Atlanta Federal Center
61 Forsyth Street, SW, Suite 23T85
Atlanta, Georgia 30303

Robert B. Strobe, M.D., M.P.H.
State Health Commissioner
Office of the Commissioner
Virginia Department of Health
P.O. Box 2448
Richmond, Virginia 23218

Office of the Attorney General
Commonwealth of Virginia
900 East Main Street
Richmond, Virginia 23219

Mr. M. L. Bowling, Manager
Nuclear Licensing & Operations
Support
Innsbrook Technical Center
Virginia Electric and Power Company
5000 Dominion Blvd.
Glen Allen, Virginia 23060

Mr. Al Belisle
U.S. Nuclear Regulatory Commission
Atlanta Federal Center
61 Forsyth St., SW, Suite 23T85
Atlanta, Georgia 30303

Mr. W. R. Matthews, Manager
North Anna Power Station
P. O. Box 402
Mineral, Virginia 23117

7590-01-P

UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

In the Matter of	)	
	)	
VIRGINIA ELECTRIC AND POWER COMPANY	)	Docket Nos. 50-280 and 50-281
	)	
	)	
Surry Nuclear Power Station	)	

EXEMPTION

I.

The Virginia Electric and Power Company (VEPCO, the licensee) is the holder of Facility Operating License No. DPR-32 and Facility Operating License No. DPR-37, which authorize operation of the Surry Nuclear Power Station, Units 1 and 2. The licenses provide 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 two pressurized-water reactors at the licensee's site located in Surry County, Virginia.

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(c) 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.

By letter dated January 27, 1997, as supplemented March 24, 1997, VEPCO requested an exemption from 10 CFR 70.24(a). The Commission has reviewed the licensee's submittal and has determined that inadvertent criticality is not likely to occur in special nuclear materials handling or storage areas at Surry Nuclear Station, Units 1 and 2. The quantity of special nuclear material other than fuel that is stored on site is small

enough to preclude achieving a critical mass.

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 such an accident is not likely to occur, the licensee has radiation monitors, as required by General Design Criteria 63, in fuel storage and handling areas. These monitors will 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 General Design Criterion 63 constitute good cause for granting an exemption to the requirements of 10 CFR 70.24(a).

IV.

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 the following exemption:

The Virginia Electric and Power Company is exempt from the requirements of 10 CFR 70.24(a) for the [illegible] Nuclear Power Station, Unit 1 and Unit 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 (62 FR 44495).

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 21st day of August 1997.

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
RELATING TO REQUEST FOR EXEMPTION FROM 10 CFR 70.24(a)
VIRGINIA ELECTRIC AND POWER COMPANY
SURRY POWER STATION UNITS 1 AND 2
DOCKET NO. 50-280 & 50-281

1.0 INTRODUCTION

By letter dated January 28, 1997, as supplemented March 24, 1997, the licensee requested an exemption from the requirements of 10 CFR 70.24(a). The Commission has reviewed the licensee's submittal and has determined that procedures and design features make an inadvertent criticality in special nuclear materials handling or storage at Surry unlikely, in accordance with General Design Criterion 62, as described below.

2.0 EVALUATION

The Code of Federal Regulations at 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, a criticality accident monitoring system "using gamma- or neutron-sensitive radiation detectors which will energize clearly audible alarm signals if accidental criticality occurs." Subsection (a)(1) and (a)(2) of 10 CFR 70.24 specify the detection, sensitivity, and coverage capabilities of the monitors required by 10 CFR 70.24(a). Subsection (a)(3) of 10 CFR 70.24 requires that the licensee shall 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 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. Subsection (d) of 10 CFR 70.24 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.

The purpose of 10 CFR 70.24(a), (a)(2), and (a)(3) is to ensure that any inadvertent criticality is detected and that action is taken to protect personnel and correct the problem. By letter dated January 28, 1997, as supplemented March 24, 1997, the licensee requested an exemption from the requirements of 10 CFR 70.24(a). The licensee proposes to handle and store the unirradiated fuel and other special nuclear material without having either the criticality monitoring system or the emergency procedures specified in 10 CFR 70.24. The licensee believes that procedures and design features make an inadvertent criticality unlikely, in accordance with General Design Criterion 62.

Special nuclear material, as nuclear fuel, is stored in the spent fuel pool and the new fuel storage area. 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. New fuel is stored dry (in air) in the new fuel storage area.

Special nuclear material is also present in the form of fissile material incorporated into nuclear instrumentation. The small quantity of special nuclear material present in these items precludes an inadvertent criticality.

Consistent with Technical Specification Section 5.4, the spent fuel pool is designed to store the fuel in a geometric array that precludes criticality. The spent fuel racks are designed such that the effective neutron multiplication factor, k_{eff} will remain ≤ 0.95 under all normal and accident conditions for fuel of maximum nominal enrichment of 4.1 wt% U-235. The staff has found this design adequate.

The new fuel storage area is 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 nominal enrichment of 4.1 wt% U-235 for the new fuel assemblies results in a maximum $k_{eff} \leq 0.95$ under conditions of accidental flooding by unborated water, and $k_{eff} \leq 0.98$ under conditions of low-density optimum moderation. The staff has found the design of the licensee's new fuel storage racks to be adequate to store fuel enriched to 4.1 wt% U-235.

Nuclear fuel is moved between the shipping container, the new fuel storage racks, the reactor vessel, and the spent fuel pool to accommodate refueling operations. In all cases, fuel movements are procedurally controlled and designed to preclude conditions involving criticality concerns. The fuel handling equipment used to unload and transfer the new fuel assemblies from the shipping containers to the storage racks precludes handling more than one fuel assembly at a time.

Procedures and controls prevent an inadvertent criticality during fuel handling; nevertheless radiation monitoring, as required by General Design Criterion 63, is provided in the new fuel storage area. An area radiation monitor is provided in the new fuel storage area and a second radiation monitor is provided on the fuel pit bridge crane. These required radiation monitors have associated area alarms and control room annunciators and would detect excessive radiation levels.

Training is required of all nuclear employees prior to receiving a badge to enter the nuclear power station. Nuclear employee retraining is provided annually to nuclear workers thereafter. This training provides those individuals having access to the Radiological Control Area direction regarding their required response upon hearing an alarm associated with an area radiation monitor.

The purpose of 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 reasonable and satisfactory precautions exist to preclude a nuclear criticality accident, thereby meeting the requirements of General Design Criterion 62, the licensee has radiation monitors, as required by General Design Criterion 63, in fuel storage and handling areas. These monitors will 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 General Design Criterion 63 and radiation worker training constitute good cause for granting an exemption to the requirements of 10 CFR 70.24(a).

3.0 CONCLUSION

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(a) are met because criticality is extremely unlikely with the present design configuration, TS requirements, administrative controls, and the fuel handling equipment and procedures. Therefore, the staff concludes that the licensee's request for an exemption from the requirements of 10 CFR 70.24(a) is acceptable and should be granted.

Principal Contributor: L. Kopp

Dated: August 21, 1997

Mr. S. K. Gambhir
Division Manager - Engineering & Operations Support
Omaha Public Power District
Fort Calhoun Station FC-2-4 Adm.
Post Office Box 399
Hwy. 75 - North of Fort Calhoun
Fort Calhoun, Nebraska 68023-0399

SUBJECT: ISSUANCE OF EXEMPTION FROM THE REQUIREMENTS OF 10 CFR 70.24 - FORT CALHOUN STATION, UNIT NO. 1 (TAC NO. M99544)

Dear Mr. Gambhir:

By letter dated August 29, 1997, as supplemented by letter date October 23, 1997, Omaha Public Power District requested an exemption from the requirements of 10 CFR 70.24 concerning criticality monitors.

Based upon the information provided, there is reasonable assurance that irradiated and unirradiated fuel will remain subcritical; furthermore, you maintain radiation monitors in accordance with General Design Criterion (GDC) 63. The low probability of a criticality together with your adherence to GDC 63 constitute good cause for granting an exemption from 10 CFR 70.24.

The U.S. Nuclear Regulatory Commission, pursuant to 10 CFR 70.14, has issued the enclosed exemption for Fort Calhoun Station, Unit No. 1. A copy of the exemption is being forwarded to the Office of Federal Register for publication.

Sincerely,
Original Signed by Mel Fields for
L. Raynard Wharton, Project Manager
Project Directorate IV-2
Division of Reactor Projects - III/IV
Office of Nuclear Reactor Regulation

Docket No. 50-285

Enclosure: Exemption

cc w/encl: See next page

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cc w/encl:
Winston & Strawn
ATTN: Perry D. Robinson, Esq.
1400 L Street, N.W.
Washington, DC 20005-3502

Mr. Jack Jensen, Chairman
Washington County Board
of Supervisors
Blair, Nebraska 68008

Mr. Wayne Walker, Resident Inspector
U.S. Nuclear Regulatory Commission
Post Office Box 309
Fort Calhoun, Nebraska 68023

Regional Administrator, Region IV
U.S. Nuclear Regulatory Commission
611 Ryan Plaza Drive, Suite 1000
Arlington, Texas 76011

Ms. Cheryl Rodgers, LLRW Program Manager
Environmental Protection Section
Nebraska Department of Health
301 Centennial Mall, South
P.O. Box 95007
Lincoln, Nebraska 68509-5007

Mr. James W. Chase, Manager
Fort Calhoun Station
Post Office Box 399
Fort Calhoun, Nebraska 68023

Mr. James [illegible]
Manager - Nuclear Licensing
Omaha Public Power District
Fort Calhoun Station FC-2-4 Adm.
Post Office Box 399
Hwy. 75 - North of Fort Calhoun
Fort Calhoun, Nebraska 68023-0399

7590-01-P

UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

In the Matter of	)	
	)	
OMAHA PUBLIC POWER DISTRICT	)	Docket No. 50-285
	)	
Fort Calhoun Station, Unit No. 1	)	

EXEMPTION

I.

The Omaha Public Power District (OPPD) is the holder of Facility Operating License No. DPR-40 for the Fort Calhoun Station, Unit No. 1 (FCS), which authorizes operation of the Fort Calhoun Station, Unit No. 1. 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.

The facility consists of a one-loop, [illegible] water reactor at the licensee's site located in Washington County, Nebraska.

II.

Section 70.24 of Title 10 of the Code of Federal Regulations, "Criticality Accident Requirements," requires that each licensee authorized to possess special nuclear material (SNM) shall maintain a criticality accident monitoring system in each area where such material is handled, used, or stored. Subsections (a)(1) and (a)(2) of 10 CFR 70.24 specify 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 SNM is handled, used, or stored and provides that (1) the procedures ensure that all personnel withdraw to an area of safety upon the sounding of a criticality accident monitor alarm, (2) the procedures must include drills to familiarize personnel with the evacuation plan, and (3) 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 SNM 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 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 SNM that could be assembled into a critical mass at FCS is in the form of nuclear fuel. In addition, the quantity of SNM other than fuel that is stored on site in any given location is small enough to preclude achieving a critical mass. As set forth below, the Commission's technical staff has evaluated the possibility of an inadvertent criticality of the nuclear fuel at FCS.

By letter dated August 29, 1997, as supplemented by letter dated October 23, 1997, the licensee requested an exemption from the requirements of 10 CFR 70.24 in its entirety for FCS. The licensee proposes to handle and store unirradiated fuel without having a criticality monitoring system with the sensitivity required by 10 CFR 70.24.

The basis for the staff to determine that inadvertent or accidental criticality is extremely unlikely can be established through compliance with the FCS 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.

SNM, as nuclear fuel, is stored in the new fuel storage rack and in the spent fuel pool. The spent fuel pool is used to store irradiated fuel under water after its discharge from the reactor and new (unirradiated) fuel prior to loading into the reactor. New fuel is stored in the new fuel storage rack in a dry condition.

SNM is also present in the form of excore fission chamber detectors and startup neutron sources. The small quantity of SNM 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 for fuel enriched to 4.5 wt% U-235. 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 onsite and prior to loading in the reactor or spent fuel pool. The spacing between new fuel assemblies and the solid neutron absorbers in the storage racks is sufficient to

maintain the dry array in a subcritical condition. The new fuel storage rack is located at an elevation of 18.75 feet above the main floor which provides adequate drainage and precludes flooding. Because no fire protection sprinkler system exists in this area, there is no source of low-density aqueous foam optimum moderation. The current approved maximum enrichment of 4.5 wt% U-235 for the new fuel assemblies results in a maximum k_{eff} of less than 0.90 under dry conditions.

Nuclear fuel is moved between the NRC-approved shipping containers, the new fuel storage racks, the reactor vessel, and the spent fuel pool to accommodate refueling operations. In all cases, fuel movements are procedurally controlled and designed to preclude conditions involving criticality concerns. For example, during new fuel receipt inspection, FCS fuel handling procedures allow a maximum of two fuel assemblies to be in the inspection stands in the receipt area (out of the shipping container and not in the new fuel storage rack). However, when installed in the inspection stands, both assemblies have an edge-to-edge separation distance in excess of 14 feet. This geometric spacing is well in excess of that maintained by the NRC-approved shipping container (approximately 3 inches). There are no sprinklers in the new fuel receipt/storage room and the use of fire fighting equipment is very unlikely since there are no combustible materials permanently stored in this room. Even if fire suppression water were introduced into the room, sufficient drainage exists to preclude potential moderation of new fuel assemblies. Therefore, because of the large physical separation of new fuel assemblies and the extremely unlikely event of any potential moderation, there is sufficient assurance that k_{eff} remains less than 0.95, thus precluding criticality.

FCS was licensed to the 70 General Design Criteria for Nuclear Power Plant Construction published as drafts in the Federal Register (32 FR 10213) on July 11, 1967. Draft

Criterion 18, Monitoring Fuel and Waste Storage, was met. As noted in Section 11.2.3 and Appendix G of the FCS Updated Safety Analysis Report, area monitoring of dose rates is supplied in the containment and auxiliary buildings, including the fuel storage areas. Local and control room alarms and indicators (not necessarily meeting the 10 CFR 70.24 sensitivity requirements) are provided to alert personnel to take appropriate action in the unlikely event of excessive radiation levels due to accidental criticality.

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 SNM, personnel would be alerted to that fact and would take appropriate action. In view of the above information, the staff has determined that it is extremely unlikely for an inadvertent criticality to occur in SNM handling or storage areas at FCS. Criticality is precluded with the present design configuration, Technical Specification requirements, administrative controls, and the fuel handling equipment and procedures. In addition, as described above, the licensee has radiation monitors, as required by General Design Criterion 63, in fuel storage and handling areas. These monitors will 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 General Design Criterion 63, constitutes good cause for granting an exemption to the requirements of 10 CFR 70.24.

IV.

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

Omaha Public Power District an exemption as described in Section II above from 10 CFR 70.24, "Criticality Accident Requirements" for the Fort Calhoun Station.

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 5821).

This exemption is effective upon issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

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

Dated at Rockville, Maryland,
this 6th day of February 1998

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

June 22, 1998

Mr. Garrett D. Edwards
Director-Licensing, MC 62A-1
PECO Energy Company
Nuclear Group Headquarters
Correspondence Control Desk
P.O.Box No. 195
Wayne, PA 19087-0195

SUBJECT: ISSUANCE OF EXEMPTION FROM THE REQUIREMENTS OF 10 CFR 70.24 PEACH BOTTOM ATOMIC POWER STATION, UNITS 2 AND 3 - (TAC NOS. MA1342 AND MA1343)

Dear Mr. Edwards:

By letter dated March 18, 1998, PECO Energy Company requested an exemption from the requirements of 10 CFR 70.24 concerning criticality accident requirements at Peach Bottom Atomic Power Station (PBAPS), Units 2 and 3.

Based upon the review of the information provided, the Commission's technical staff has determined that it is extremely unlikely for the special nuclear material (SNM) at PBAPS Units 2 and 3 to be assembled into a critical mass and it is extremely unlikely for an inadvertent criticality accident to occur in SNM handling and storage areas at PBAPS Units 2 and 3. The low probability of an inadvertent criticality accident constitutes a good cause for granting an exemption from 10 CFR 70.24(a).

The U.S. Nuclear Regulatory Commission, pursuant to 10 CFR 70.14, has issued the enclosed exemption for PBAPS Units 2 and 3. A copy of the exemption is being forwarded to the Office of Federal Register for publication.

Sincerely,

Mohan C. Thadani, Senior Project Manager
Project Directorate I-2
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Docket Nos. 50-277
and 50-278

Enclosure: Exemption

cc w/encl: See next page

June 22, 1998

Mr. Garrett D. Edwards
Director-Licensing, MC 62A-1
PECO Energy Company
Nuclear Group Headquarters
Correspondence Control Desk
P.O.Box No. 195
Wayne, PA 19087-0195

SUBJECT: ISSUANCE OF EXEMPTION FROM THE REQUIREMENTS OF 10 CFR 70.24 PEACH BOTTOM ATOMIC POWER STATION, UNITS 2 AND 3 - (TAC NOS. MA1342 AND MA1343)

Dear Mr. Edwards:

By letter dated March 18, 1998, PECO Energy Company requested an exemption from the requirements of 10 CFR 70.24 concerning criticality accident requirements at Peach Bottom Atomic Power Station (PBAPS), Units 2 and 3.

Based upon the review of the information provided, the Commission's technical staff has determined that it is extremely unlikely for the special nuclear material (SNM) at PBAPS Units 2 and 3 to be assembled into a critical mass and it is extremely unlikely for an inadvertent criticality accident to occur in SNM handling and storage areas at PBAPS Units 2 and 3. The low probability of an inadvertent criticality accident constitutes a good cause for granting an exemption from 10 CFR 70.24(a).

The U.S. Nuclear Regulatory Commission, pursuant to 10 CFR 70.14, has issued the enclosed exemption for PBAPS Units 2 and 3. A copy of the exemption is being forwarded to the Office of Federal Register for publication.

Sincerely,

/s/
Mohan C. Thadani, Senior Project Manager
Project Directorate I-2
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Docket Nos. 50-277
and 50-278

Enclosure: Exemption

cc w/encl: See next page

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J. W. Durham, Sr., Esquire
Sr. V.P. & General Counsel
PECO Energy Company
2301 Market Street, S26-1
Philadelphia, PA 19101

PECO Energy Company
ATTN: Mr. T. N. Mitchell, Vice President
Peach Bottom Atomic Power Station
1848 Lay Road
Delta, PA 17314

PECO Energy Company
ATTN: Regulatory Engineer, A4-5S
Peach Bottom Atomic Power Station
1848 Lay Road
Delta, PA 17314

Resident Inspector
U.S. Nuclear Regulatory Commission
Peach Bottom Atomic Power Station
P.O. Box 399
Delta, PA 17314

Regional Administrator, Region I
U.S. Nuclear Regulatory Commission
475 Allendale Road
King of Prussia, PA 19406

Mr. Roland Fletcher
Department of Environment
201 West Preston Street
Baltimore, MD 21201

A. F. Kirby, III
External Operations - Nuclear
Delmarva Power & Light Company
P.O. Box 231
Wilmington, DE 19899

PECO Energy Company
Plant Manager
Peach Bottom Atomic Power Station
1848 Lay Road
Delta, PA 17314

Chief-Division of Nuclear Safety
PA Dept. of
Environmental Resources
P.O. Box 8469
Harrisburg, PA 17105-8469

Board of Supervisors
Peach Bottom Township
R. D. #1
Delta, PA 17314

Public Service Commission of Maryland
Engineering Division
Chief Engineer
6 St. Paul Centre
Baltimore, MD 21202-6806

Mr. Richard McLean
Power Plant and Environmental
Review Division
Department of Natural Resources
B-3, Tawes State Office Building
Annapolis, MD 21401

Dr. Judith Johnsrud
National Energy Committee
Sierra Club
433 Orlando Avenue
State College, PA 16803

Manager-Financial Control & Co-Owner
Affairs
Public Service Electric and Gas
Company
P.O. Box 236
Hancocks Bridge, NJ 08038-0236

Manager-Peach Bottom Licensing
PECO Energy Company
Nuclear Group Headquarters
Correspondence Control Desk
P.O. Box No. 195
Wayne, PA 19087-0195

7590-01-P

UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

In the Matter of PECO Energy Company	)	
	)	Docket Nos. 50-277 and 50-278
(Peach Bottom Atomic Power Station, Units 2 and 3)	)	

EXEMPTION

I.

PECO Energy Company (the licensee) is the holder of Facility Operating License Nos. DPR-44 and DPR-56, which authorize operation of Peach Bottom Atomic Power Station (PBAPS), Units 2 and 3. 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.

The facility consists of two boiling-water reactors at the licensee's site located in York County, Pennsylvania.

II.

Section 70.24 of Title 10 of the CODE OF FEDERAL REGULATIONS, "Criticality Accident Requirements," requires that each licensee authorized to possess special nuclear material (SNM) shall maintain a criticality accident monitoring system in each area where such material is handled, used, or stored. Subsections (a)(1) and (a)(2) of 10 CFR 70.24 specify detection and sensitivity requirements that these monitors must meet. Subsection (a)(3) of 10 CFR 70.24 requires licensees to maintain emergency procedures for each area in which this licensed SNM

is handled, used, or stored and provides that (1) the procedures ensure that all personnel withdraw to an area of safety upon the sounding of a criticality accident monitor alarm, (2) the procedures must include drills to familiarize personnel with the evacuation plan, and (3) 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 SNM 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 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 SNM that could be assembled into a critical mass at PBAPS, Units 2 and 3, is in the form of nuclear fuel; the quantity of SNM other than fuel that is stored on site in any given location 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 PBAPS, Units 2 and 3, and has determined that it is extremely unlikely for such an accident to occur if the licensee meets the following seven criteria:

1. Only three new fuel assemblies are allowed out of a shipping cask or storage rack at one time.

2. The k-effective does not exceed 0.95, at a 95% probability, 95% confidence level in the event that the fresh fuel storage racks are filled with fuel of the maximum permissible U-235 enrichment and flooded with pure water.
3. If optimum moderation occurs at low moderator density, then the k-effective does not exceed 0.98, at a 95% probability, 95% confidence level in the event that the fresh fuel storage racks are filled with fuel of the maximum permissible U-235 enrichment and flooded with a moderator at the density corresponding to optimum moderation.
4. The k-effective does not exceed 0.95, at a 95% probability, 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 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 limited to 5.0 weight percent.

By letter dated March 18, 1998, the licensee requested an exemption from 10 CFR 70.24. In this request the licensee addressed the seven criteria given above. The Commission's technical staff has reviewed the licensee's submittal and has determined that PBAPS, Units 2 and 3, meet the applicable criteria. Criteria 2 and 3 are not applicable to PBAPS, Units 2 and 3, since Technical Specification Section 4.3.1.2 specifically states, "The new fuel storage racks shall not be used for fuel storage. The new fuel shall be stored in the spent fuel storage racks." The reference to General Design Criterion (GDC) 63 was initially incorporated to ensure that licensees receiving an exemption to 10 CFR 70.24 would not erroneously view the exemption as

the basis for removing from the spent fuel pool area radiation monitors that were meeting other monitoring requirements, such as those contained in GDC 63. However, Criterion 63 is not applicable to PBAPS because the units were evaluated against the draft GDCs current when PBAPS was licensed rather than the current GDCs proposed in July 1967. Thus, even though PBAPS is not required to meet GDC 63, the staff has determined that it is extremely unlikely for an inadvertent criticality to occur in SNM handling and storage areas at PBAPS, Units 2 and 3. Additionally, PBAPS, Units 2 and 3, have area radiation monitors (ARMs) that meet the requirements of 10 CFR 70.24(a)2, and function as a monitoring system capable of detecting criticality in the only area (the refuel floor) where accidental criticality is possible.

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 SNM, personnel would be alerted to that fact and would take appropriate action. The staff has determined that it is extremely unlikely that such an accident could occur. The low probability of an inadvertent criticality constitutes good cause for granting an exemption from the requirements of 10 CFR 70.24(a).

IV.

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 PECO Energy Company, an exemption from the requirements of 10 CFR 70.24(a) for Peach Bottom Atomic Power Station, Units 2 and 3.

Pursuant to 10 CFR 51.32, the Commission has determined that the granting of this exemption will have no significant impact on the environment

(63 FR 33735).

This exemption is effective upon issuance.

Dated at Rockville, Maryland, this 22nd day of June 1998.

FOR THE NUCLEAR REGULATORY COMMISSION

original signed by

Samuel J. Collins, Director
Office of Nuclear Reactor Regulation

OFFICE	PDI-2/PM	PDI-2/LA	PDI-2/D	OGC	SRXB/BC(A)
NAME	MThadani:mw	MO'Brien	RCapra		TCollins
DATE	5/27/98	5/26/98	6/27/98	6/8/98	6/01/98

OFFICE	DRPE/D(A)	ADPR/AD(A)	NRR/D		
NAME	JZwolinski	BBoger	SCollins		
DATE	6/18/98	6/18/98	6/19/98		

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Pursuant to 10 CFR 51.32, the Commission has determined that the granting of this exemption will have no significant impact on the environment

(63 FR 33735).

This exemption is effective upon issuance.

Dated at Rockville, Maryland, this 22nd day of June 1998.

FOR THE NUCLEAR REGULATORY COMMISSION

Samuel J. Collins, Director
Office of Nuclear Reactor Regulation

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

January 30, 1998

Mr. George A. Hunger, Jr.
Director-Licensing, MC 62A-1
PECO Energy Company
Nuclear Group Headquarters
Correspondence Control Desk
P.O. Box No. 195
Wayne, PA 19087-0195

SUBJECT: ISSUANCE OF EXEMPTION FROM THE REQUIREMENTS OF 10 CFR 70.24, LIMERICK GENERATING STATION, UNIT 1 (TAC NO. MA0327)

Dear Mr. Hunger:

By letter dated December 23, 1997, the Philadelphia Electric Company requested an exemption from certain requirements of 10 CFR 70.24 concerning criticality monitors.

Based upon the information provided, there is reasonable assurance that irradiated and unirradiated fuel will remain subcritical; furthermore, you maintain radiation monitors in accordance with General Design Criterion (GDC) 63. The low probability of a criticality together with your adherence to GDC 63 constitutes good cause for granting an exemption from 10 CFR 70.24(a).

The U.S. Nuclear Regulatory Commission, pursuant to 10 CFR 70.14, has issued the enclosed exemption for Limerick Generating Station, Unit 1. A copy of the exemption is being forwarded to the Office of Federal Register for publication.

This completes our effort on this issue and we are, therefore, closing out TAC No. MA0327.

Sincerely,

Bartholomew C. Buckley

Bartholomew C. Buckley, Senior Project Manager
Project Directorate I-2
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Docket No. 50-352

Enclosure: Exemption

cc w/encl: See next page

cc:

J. W. Durham, Sr., Esquire
Sr. V.P. & General Counsel
PECO Energy Company
2301 Market Street
Philadelphia, PA 19101

Manager-Limerick Licensing, 62A-1
PECO Energy Company
965 Chesterbrook Boulevard
Wayne, PA 19087-5691

Mr. Walter G. MacFarland, Vice President
Limerick Generating Station
Post Office Box A
Sanatoga, PA 19464

Plant Manager
Limerick Generating Station
P.O. Box A
Sanatoga, PA 19464

Regional Administrator, Region I
U.S. Nuclear Regulatory Commission
475 Allendale Road
King of Prussia, PA 19406

Senior Resident Inspector
U.S. Nuclear Regulatory Commission
Limerick Generating Station
P.O. Box 596
Pottstown, PA 19464

Director-Site Support Services
Limerick Generating Station
P.O. Box A
Sanatoga, PA 19464

Chairman
Board of Supervisors
of Limerick Township
646 West Ridge Pike
Linfield, PA 19468

Chief-Division of Nuclear Safety
PA Dept. of Environmental Resources
P.O. Box 8469
Harrisburg, PA 17105-8469

Director-Site Engineering
Limerick Generating Station
P.O. Box A
Sanatoga, PA 19464

Manager-Experience Assessment
Limerick Generating Station
P.O. Box A
Sanatoga, PA 19464

Library
U.S. Nuclear Regulatory Commission
Region I
475 Allendale Road
King of Prussia, PA 19406

Senior Manager-Operations
Limerick Generating Station
P.O. Box A
Sanatoga, PA 19464

Dr. Judith Johnsrud
National Energy Committee
Sierra Club
433 Orlando Avenue
State College, PA 16803

7590-01-P

UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

In the Matter of	)	
	)	
	)	
PHILADELPHIA ELECTRIC COMPANY	)	Docket No. 50-352
	)	
	)	
(Limerick Generating Station, Unit 1)	)	

EXEMPTION

I.

The Philadelphia Electric Company (the licensee) is the holder of Facility Operating License No. NPF-39, which authorizes operation of the Limerick Generating Station (LGS), Unit 1. 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.

The facility consists of two boiling-water reactors at the licensee's site located in Montgomery and Chester Counties, Pennsylvania.

II.

Section 70.24 of Title 10 of the CODE OF FEDERAL REGULATIONS, "Criticality Accident Requirements," requires that each licensee authorized to possess special nuclear material (SNM) shall maintain a criticality accident monitoring system in each area where such material is handled, used, or stored. Subsections (a)(1) and (a)(2) of 10 CFR 70.24 specify 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 SNM is handled, used, or stored and provides that (1) the procedures ensure that all personnel withdraw to an area of safety upon the sounding of a criticality accident monitor alarm, (2) the procedures must include drills to familiarize personnel with the evacuation plan, and (3) 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 SNM 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 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 SNM that could be assembled into a critical mass at LGS, Unit 1, is in the form of nuclear fuel; the quantity of SNM other than fuel that is stored on site in any given location 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 LGS, Unit 1, and has determined that it is extremely unlikely for such an accident to occur if the licensee meets the following seven criteria:

1. Only three new fuel assemblies are allowed out of a shipping cask or storage rack at one time.
2. The k-effective does not exceed 0.95, at a 95% probability, 95% confidence level in the event that the fresh fuel storage racks are filled with fuel of the maximum permissible U-235 enrichment and flooded with pure water.
3. If optimum moderation occurs at low moderator density, then the k-effective does not exceed 0.98, at a 95% probability, 95% confidence level in the event that the fresh fuel storage racks are filled with fuel of the maximum permissible U-235 enrichment and flooded with a moderator at the density corresponding to optimum moderation.
4. The k-effective does not exceed 0.95, at a 95% probability, 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 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 limited to 5.0 weight percent.

By letter dated December 23, 1997, the licensee requested an exemption from 10 CFR 70.24. In this request the licensee addressed the seven criteria given above. The Commission's technical staff has reviewed the licensee's submittals and has determined that LGS, Unit 1 meets the applicable criteria. Criteria 2 and 3 are not applicable to LGS, Unit 1 since it has no fresh

fuel strorage racks, for prevention of inadvertent criticality; therefore, the staff has determined that it is extremely unlikely for an inadvertent criticality to occur in SNM handling or storage areas at LGS, Unit 1.

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 SNM, personnel would be alerted to that fact and would take appropriate action. The staff has determined that it is extremely unlikely that such an accident could occur; furthermore, the licensee has radiation monitors, as required by General Design Criterion 63, in fuel storage and handling areas. These monitors will 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 General Design Criterion 63, constitutes good cause for granting an exemption to the requirements of 10 CFR 70.24(a).

IV.

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 the Philadelphia Electric Company, an exemption from the requirements of 10 CFR 70.24(a) for Limerick Generating Station, Unit 1.

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 4497).

This exemption is effective upon issuance.

Dated at Rockville, Maryland, this 30th day of January 1998.

FOR THE NUCLEAR REGULATORY COMMISSION

Samuel J. Collins, Director
Office of Nuclear Reactor Regulation

Mr. George A. Hunger, Jr.
Director-Licensing, MC 62A-1
PECO Energy Company
Nuclear Group Headquarters
Correspondence Control Desk
P.O. Box No. 195
Wayne, PA 19087-0195

January 23, 1998

SUBJECT: ENVIRONMENTAL ASSESSMENT OF REQUEST FOR EXEMPTION FROM 10 CFR 70.24 CRITICALITY ACCIDENT REQUIREMENTS - LIMERICK GENERATING STATION (LSG), UNIT 1 (TAC NO. MA0327)

Dear Mr. Hunger:

Enclosed for your information is a copy of an "Environmental Assessment and Finding of No Significant Impact." This assessment relates to your application dated December 23, 1997, which requested an exemption from certain requirements of 10 CFR 70.24, "Criticality Accident Requirements," for the LGS, Unit 1.

The assessment is being forwarded to the Office of the Federal Register for publication.

Sincerely,

/S/

Bartholomew C. Buckley, Senior Project Manager
Project Directorate I-2
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Docket No. 50-352

Enclosure: Environmental Assessment

cc w/encl: See next page

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Mr. George A. Hunger, Jr.
PECO Energy Company

Limerick Generating Station,
Units 1 & 2

cc:

J. W. Durham, Sr., Esquire
Sr. V.P. & General Counsel
PECO Energy Company
2301 Market Street
Philadelphia, PA 19101

Chief-Division of Nuclear Safety
PA Dept. of Environmental Resources
P.O. Box 8469
Harrisburg, PA 17105-8469

Manager-Limerick Licensing, 62A-1.
PECO Energy Company
965 Chesterbrook Boulevard
Wayne, PA 19087-5691

Director-Site Engineering
Limerick Generating Station
P.O. Box A
Sanatoga, PA 19464

Mr. Walter G. MacFarland, Vice President
Limerick Generating Station
Post Office Box A
Sanatoga, PA 19464

Manager-Experience Assessment
Limerick Generating Station
P.O. Box A
Sanatoga, PA 19464

Plant Manager
Limerick Generating Station
P.O. Box A
Sanatoga, PA 19464

Library
U.S. Nuclear Regulatory Commission
Region I
475 Allendale Road
King of Prussia, PA 19406

Regional Administrator, Region I
U.S. Nuclear Regulatory Commission
475 Allendale Road
King of Prussia, PA 19406

Senior Manager-Operations
Limerick Generating Station
P.O. Box A
Sanatoga, PA 19464

Senior Resident Inspector
U.S. Nuclear Regulatory Commission
Limerick Generating Station
P.O. Box 596
Pottstown, PA 19464

Dr. Judith Johnsrud
National Energy Committee
Sierra Club
433 Orlando Avenue
State College, PA 16803

Director-Site Support Services
Limerick Generating Station
P.O. Box A
Sanatoga, PA 19464

Mr. Roy Denmark
Environmental Review Coordinator
841 Chestnut Street
Philadelphia, PA 19107

Chairman
Board of Supervisors
of Limerick Township
646 West Ridge Pike
Linfield, PA 19468

7590-01-P

UNITED STATES NUCLEAR REGULATORY COMMISSION

PHILADELPHIA ELECTRIC COMPANY

DOCKET NO. 50-352

LIMERICK GENERATING STATION, UNIT 1

ENVIRONMENTAL ASSESSMENT AND FINDING OF

NO SIGNIFICANT IMPACT

The U.S. Nuclear Regulatory Commission (the Commission) is considering issuance of an exemption from certain requirements of its regulations for Facility Operating License No. NPF-39 issued to Philadelphia Electric Company (the licensee), for operation of the Limerick Generating Station (LGS), Unit 1, located in Montgomery and Chester Counties, Pennsylvania.

ENVIRONMENTAL ASSESSMENT

Identification of the Proposed Action:

The proposed action would exempt Philadelphia Electric Company from the requirements of 10 CFR 70.24(a), which requires in each area in which special nuclear material is handled, used, or stored, a monitoring system that will energize clear audible alarms if accidental criticality occurs. The proposed action would also exempt the licensee from the requirements to 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, to familiarize personnel with the evacuation plan, and to designate responsible individuals for determining the cause of the alarm, and to place radiation survey instruments in accessible locations for use in such an emergency.

The proposed action is in accordance with the licensee's application for exemption dated December 23, 1997.

The Need for the Proposed Action:

The purpose of 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. At a commerical nuclear power plant the inadvertent criticality with which 10 CFR 70.24 is concerned could occur during fuel handling operations. The special nuclear material that could be assembled into a critical mass at a commercial nuclear power plant is in the form of nuclear fuel; the quantity of other forms of special nuclear material that is stored on site in any given location is small enough to preclude achieving a critical mass. Because the fuel is not enriched beyond 5.0 weight percent Uranium-235 and because commercial nuclear plant licensees have procedures and design features that prevent inadvertent criticality, the staff has determined that it is unlikely that an inadvertent criticality could occur due to the handling of special nuclear material at a commercial power reactor. The requirements of 10 CFR 70.24(a), therefore, are not necesssary to ensure the safety of personnel during the handling of special nuclear materials at commercial power reactors. However, an exemption to 10 CFR 70.24(a) is needed to permit deviation from these requirements.

Environmental Impacts of the Proposed Action:

The Commission has completed its evaluation of the proposed action and concludes that the proposed action involves features located entirely within the protected area as defined in 10 CFR Part 20.

The proposed action will not result in an increase in the probability or consequences of accidents or result in a change in occupational or offsite dose. Therefore, there are no radiological impacts associated with the proposed action.

The proposed action will not result in a change in nonradiological plant effluents and will have no other nonradiological environmental impact.

Accordingly, the Commission concludes that there are no environmental impacts associated with this action.

Alternatives to the Proposed Action:

Since the Commission has concluded there is no measurable environmental impact associated with the proposed action, any alternatives with equal or greater environmental impact need not be evaluated. As an alternative to the proposed exemption, the staff considered denial of the requested exemption. Denial of the request would result in no change in current environmental impacts. The environmental impacts of the proposed action and the alternative action are similar.

Alternative Use of Resources:

This action does not involve the use of any resources not previously considered in the "Final Environmental Statement Related to the Operation of Limerick Generating Station, Units 1 and 2," dated November 1973.

Agencies and Persons Consulted:

In accordance with its stated policy, on January 23, 1998, the staff consulted with the Pennsylvania State official, Mr. David Ney of the Bureau of Radiation Protection, Department of Environmental Protection, regarding the environmental impact of the proposed action. The State official had no comments.

FINDING OF NO SIGNIFICANT IMPACT

Based upon the environmental assessment, the Commission concludes that the proposed action will not have a significant effect on the quality of the human environment.

Accordingly, the Commission has determined not to prepare an environmental impact statement for the proposed action.

For further details with respect to the proposed action, see the licensee's letter dated December 23, 1997, which is available for public inspection at the Commission's Public Document Room, The Gelman Building, 2120 L Street, NW., Washington, DC, and at the local public document room located at the Pottstown Public Library, 500 High Street, Pottstown, PA 19464.

Dated at Rockville, Maryland, this 23rd day of January 1998.

FOR THE NUCLEAR REGULATORY COMMISSION

Bartholomew C. Buckley, Senior Project Manager
Project Directorate I-2
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Mr. Joseph J. Hagan
Vice President, Operations GGNS
Entergy Operations, Inc.
P. O. Box 756
Port Gibson, MS 39150

SUBJECT: EXEMPTION FROM CRITICALITY ACCIDENT REQUIREMENTS IN 10 CFR 70.24(a) - GRAND GULF NUCLEAR STATION, UNIT 1 (TAC NO. M96177)

Dear Mr. Hagan:

The enclosed exemption, as requested in your application dated July 15, 1996, (GNRO-96/00082), and supplemented by letters dated March 7 and April 29, 1997, (GNRO-97/00021 and 00035), is from the criticality monitoring requirements of 10 CFR 70.24(a), "Criticality Accident Requirements." The exemption concerns the storage of special nuclear material (SNM) in the form of (1) in-core nuclear instrumentation (e.g., source range monitors) when not in use and (2) unirradiated fuel. For unirradiated fuel, the exemption was requested for unirradiated fuel that is packaged in accordance with 10 CFR Part 71, "Packaging and Transportation of Radioactive Material," while the fuel is taken from the shipping trucks to the spent fuel pool area to be removed from the packaging, and for unirradiated fuel that is stored in the new fuel vault (NFV). For this exemption, you have committed to have (1) the total quantity of SNM present in the nuclear instrumentation less than a critical mass and (2) the unirradiated fuel is only removed from the Part 71 packaging in areas where a criticality accident monitor system is in use. As stated in the letter dated March 7, 1997, you have administrative controls to prevent optimum moderation of the unirradiated fuel in the NFV.

The Commission has granted this Exemption pursuant to 10 CFR 70.14. A copy of the Exemption is being forwarded to the Office of the Federal Register for publication. In granting this exemption, the staff is relying on the above two commitments.

Sincerely, 10/31/97

Jack N. Donohew, Senior Project Manager
Project Directorate IV-1
Division of Reactor Projects III/IV
Office of Nuclear Reactor Regulation

Docket No. 50-416

DISTRIBUTION: See next page

Enclosure: Exemption

cc w/encl: See next page

*See previous concurrence
Document Name: GG96177.EXE
SRXB Memo dated: March 11, 1997

#76

OFFICE	PM/PDIV-1	LA/PDIV-1	OGC*	(A)D/PDIV-1	D/DRPW	SRXB:DSSA
NAME	JDonohew/sp	CHawes CMH	APH	JClifford	JRoe	TCollins
DATE	9/17/97	9/17/97	07/30/97	9/18/97	9/25/97	10/06/97
COPY	YES/NO	YES/NO	YES/NO	YES/NO	YES/NO	

OFFICE	D/NMSS/FCSS	D/ADRP	D/NRR
NAME	ETen Eyck	RZimmerman	SCollins
DATE	/97	10/20/97	10/30/97
COPY	YES/NO	YES/NO KD	YES/NO

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Concurrence not needed JNDonohew 9/24/97

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

October 31, 1997

Mr. Joseph J. Hagan
Vice President, Operations GGNS
Entergy Operations, Inc.
P. O. Box 756
Port Gibson, MS 39150

SUBJECT: EXEMPTION FROM CRITICALITY ACCIDENT REQUIREMENTS IN 10 CFR 70.24(a) - GRAND GULF NUCLEAR STATION, UNIT 1 (TAC NO. M96177)

Dear Mr. Hagan:

The enclosed exemption, as requested in your application dated July 15, 1996, (GNRO-96/00082), and supplemented by letters dated March 7 and April 29, 1997, (GNRO-97/00021 and 00035), is from the criticality monitoring requirements of 10 CFR 70.24(a), "Criticality Accident Requirements." The exemption concerns the storage of special nuclear material (SNM) in the form of (1) in-core nuclear instrumentation (e.g., source range monitors) when not in use and (2) unirradiated fuel. For unirradiated fuel, the exemption was requested for unirradiated fuel that is packaged in accordance with 10 CFR Part 71, "Packaging and Transportation of Radioactive Material," while the fuel is taken from the shipping trucks to the spent fuel pool area to be removed from the packaging, and for unirradiated fuel that is stored in the new fuel vault (NFV). For this exemption, you have committed to have (1) the total quantity of SNM present in the nuclear instrumentation less than a critical mass and (2) the unirradiated fuel is only removed from the Part 71 packaging in areas where a criticality accident monitor system is in use. As stated in the letter dated March 7, 1997, you have administrative controls to prevent optimum moderation of the unirradiated fuel in the NFV.

The Commission has granted this Exemption pursuant to 10 CFR 70.14. A copy of the Exemption is being forwarded to the Office of the Federal Register for publication. In granting this exemption, the staff is relying on the above two commitments.

Sincerely,

Jack N. Donohew, Senior Project Manager
Project Directorate IV-1
Division of Reactor Projects III/IV
Office of Nuclear Reactor Regulation

Docket No. 50-416

Enclosure: Exemption

cc w/encl: See next page

cc:

Executive Vice President
& Chief Operating Officer
Entergy Operations, Inc.
P. O. Box 31995
Jackson, MS 39286-1995

Wise, Carter, Child & Caraway
P. O. Box 651
Jackson, MS 39205

Winston & Strawn
1400 L Street, N.W. - 12th Floor
Washington, DC 20005-3502

Director
Division of Solid Waste Management
Mississippi Department of Natural
Resources
P. O. Box 10385
Jackson, MS 39209

President,
Claiborne County Board of Supervisors
Port Gibson, MS 39150

Regional Administrator, Region IV
U.S. Nuclear Regulatory Commission
611 Ryan Plaza Drive, Suite 1000
Arlington, TX 76011

Senior Resident Inspector
U. S. Nuclear Regulatory Commission
Route 2, Box 399
Port Gibson, MS 39150

Manager of Operations
Bechtel Power Corporation
P.O. Box 2166
Houston, TX 77252-2166

General Manager, GGNS
Entergy Operations, Inc.
P. O. Box 756
Port Gibson, MS 39150

Attorney General
Department of Justice
State of Louisiana
P. O. Box 94005
Baton Rouge, LA 70804-9005

State Health Officer
State Board of Health
P. O. Box 1700
Jackson, MS 39205

Office of the Governor
State of Mississippi
Jackson, MS 39201

Attorney General
Asst. Attorney General
State of Mississippi
P. O. Box 22947
Jackson, MS 39225

Vice President, Operations Support
Entergy Operations, Inc.
P.O. Box 31995
Jackson, MS 39286-1995

Director, Nuclear Safety
and Regulatory Affairs
Entergy Operations, Inc.
P.O. Box 756
Port Gibson, MS 39150

7590-01-P

UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

In the Matter of	)	
	)	Docket No. 50-416
ENTERGY OPERATIONS, INC.	)	
SYSTEM ENERGY RESOURCES, INC.	)	
SOUTH MISSISSIPPI ELECTRIC POWER ASSOCIATION	)	
ENTERGY MISSISSIPPI, INC.	)	
	)	
(Grand Gulf Nuclear Station, Unit 1)	)	
	)	

EXEMPTION

I.

Entergy Operations, Inc. (the licensee) is the holder of Facility Operating License No. NPF-29, which authorizes operation of Grand Gulf Nuclear Station, Unit 1 (GGNS). The operating license provides, among other things, that the licensee is subject to all rules, regulations, and orders of the Nuclear Regulatory Commission (NRC or the Commission) now and hereafter in effect.

The facility is a General Electric boiling water reactor at the licensee's site in Claiborne County, Mississippi.

II.

Title 10 CFR 70.24, "Criticality Accident Requirements," paragraph (a) states, in part, that "Each licensee authorized to possess special nuclear material [SNM] in a quantity exceeding 700 grams of contained uranium-235, 520 grams of contained uranium-233, 450 grams of plutonium, 1,500 grams of

contained uranium-235 if no uranium enriched to more than 4 percent by weight of uranium-235 is present, 450 grams of any combination thereof, or one-half such quantities if massive moderators or reflectors made of graphite, heavy water or beryllium may be present, shall maintain in each area in which such licensed special nuclear material is handled, used, or stored, a monitoring system meeting the requirements of [10 CFR 70.24](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. This section is not intended to require underwater monitoring when special nuclear material is handled or stored beneath water shielding or to require monitoring systems when special nuclear material is being transported when packaged in accordance with the requirements of Part 71 [(i.e., 10 CFR Part 71, "Packaging and Transportation of Radioactive Material,")] of this chapter."

The licensee meets the quantity criteria in 10 CFR 70.24(a) and is, therefore, required to have a criticality accident monitoring system in each area in which SNM in any form is handled, used, or stored. The licensee has proposed an exemption to this requirement for the storage of two forms of SNM at the site: (1) not-in-use in-core nuclear instrumentation (e.g., source range monitors) and (2) onsite unirradiated fuel. For the unirradiated fuel, the exemption is requested for the following cases:

- The interval when the fuel, packaged for shipment to the site in accordance with 10 CFR Part 71, is taken from the shipping truck to the plant area where the Part 71 packaging is removed.

- The storage of the unirradiated fuel in the new fuel vault (NFV), instead of the spent fuel pool, after the packaging is removed.

The very small quantity of SNM present in the nuclear instrumentation is in the form of thin coatings within the instrumentation and the unirradiated fuel assemblies would only be removed from the NRC-approved packaging in areas where criticality monitors are in use, and stored in either the NFV or the spent fuel pool. The unirradiated fuel that is stored in the spent fuel pool would be monitored in accordance with 10 CFR 70.24(a), whereas there is not a criticality accident monitor in the NFV.

An exemption from 10 CFR 70.24(a) is required for the licensee to store SNM at the site and not have a criticality accident monitoring system for the storage areas.

III.

Pursuant to 10 CFR 70.14, "Specific exemptions," the Commission may, upon application of any interested person or upon its own initiative, grant such exemptions 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.

Pursuant to 10 CFR 70.24(d), any licensee who believes that good cause exists why it should be granted an exemption in whole or in part from the requirements of this section may apply to the Commission for such an exemption. Such application shall specify the reason for the relief requested.

By letter dated July 15, 1996, as supplemented by letters dated March 7 and April 29, 1997, the licensee requested an exemption from the monitoring requirements of 10 CFR 70.24(a) for the storage of these two forms of SNM at the site. In those letters, the licensee provided the justification and reasons for requesting the exemption. The licensee did not request an exemption to the performance requirements of a criticality accident monitoring system that are specified in 10 CFR 70.24(a)(1) or (a)(2).

A previous exemption from the provisions of 10 CFR 70.24 for the storage of SNM was granted for GGNS in the July 15, 1981, SNM License No. 1882. This exemption expired with the SNM license when the operating license was issued for GGNS because the exemption was not reissued at that time. Therefore, the licensee has requested an exemption from the criticality accident monitoring requirements of 10 CFR 70.24(a) specifically for the areas containing in-core instrumentation detectors (which are not in use) and unirradiated (fresh) fuel. For unirradiated fuel, the exemption is requested for the unirradiated fuel that is in NRC-approved packaging while the fuel is taken from the shipping trucks to the spent fuel pool area to be removed from the packaging, and for the unirradiated fuel that is stored in the NFV, instead of the spent fuel pool.

The principal form of SNM at GGNS is in the form of nuclear fuel. Other quantities of SNM are also used or stored at the facility in the form of fissile material incorporated into in-core nuclear instrumentation (e.g., source range monitors, intermediate range monitors, local power range monitors, and traversing in-core probes). The instrumentation is being stored

at the site within the security fence in different plant areas.

The SNM in the nuclear instrumentation is in small quantities in thin coatings applied to the inside of sealed fission chambers contained within the instruments. The licensee has stated that the total amount of SNM contained in the nuclear instruments meets the "forms not sufficient to form a critical mass" in Section 1.1 of Regulatory Guide 10.3, "Guide for the Preparation of Applications for Special Nuclear Material Licenses of Less Than Critical Mass Quantities," Revision 1, dated April 1977. Thus, the licensee has committed that the total amount of SNM contained within in-core nuclear instrumentation will be less than a critical mass. Therefore, the small quantity of SNM in the nuclear instrumentation precludes inadvertent criticality.

Unirradiated nuclear fuel is received at the site only in NRC-approved Part 71 packaging. The entire Part 71 packaging consists of two right rectangular boxes consisting of an outer wooden container surrounding a inner metal container housing the unirradiated fuel. There is only cushioning material between the two boxes. The containers are designed in accordance with a certificate of compliance for radioactive materials packages issued by the NRC, in this case for the shipment of unirradiated fuel assemblies. It is the inner metal container that ensures that a geometrically safe configuration of the fuel is maintained during transport, handling, storage, and accident conditions, and that the introduction of any moderating agents to the fuel is precluded due to its leak-tight construction. Criticality is precluded due to the construction of the package and the storage configuration of the fuel in the package. This is based on a criticality analysis of the Part 71 packaging which limits the number of such packages on a shipping truck.

The handling of unirradiated fuel at the site is governed by administrative and departmental procedures that specify New Fuel Processing and Criticality Rules to ensure that fuel is not inadvertently removed from the inner metal container until it is positioned in the fuel inspection area near the spent fuel pool of the auxiliary building where a criticality accident monitoring system meeting 70.24(a) is present. It is the metal container that is referred to when the licensee stated that the unirradiated fuel will only be removed from the NRC-approved packaging in the presence of a criticality accident monitoring system meeting 70.24(a).

The unirradiated fuel is brought onsite on shipping trucks. The wooden containers are removed from the inner metal containers, and the unirradiated fuel is lifted in the metal container to the 208-foot level of the auxiliary building, and adjacent to the cask washdown pit and NFV of the spent fuel pool area. Only one metal container is lifted at a time, and the crane and lifting equipment used for the lift are certified. The plant areas that the metal containers would be moved through were inspected during a visit to the site and it was determined that the areas have drains to prevent the possibility of submerging the metal containers under water and creating a possible criticality condition. The only practical plant area where the new fuel could be submerged in water to introduce moderation is the spent fuel pool and there are 70.24(a) monitors in that area.

In the spent fuel pool area, the fuel is removed from the containers, inspected and channeled, and then placed either in the spent fuel pool or the NFV. Currently the unirradiated fuel is placed only in the spent fuel pool and, while the fuel is in the spent fuel pool, it is monitored by a 70.24(a)

monitoring system; however unirradiated fuel may be stored inside the NFV and there is not a criticality accident monitor in the NFV. The design basis criticality margin requirements for the NFV is to maintain the unirradiated fuel in the vault at a subcriticality margin of at least 0.05 (i.e., a k effective no more than 0.95). The new fuel would be stored in racks that are designed to withstand all credible static and dynamic loadings to prevent damage and distortion of the racks, and to maintain the design subcriticality margin of 0.05 whether the vault is dry or flooded with unborated water, because unborated water would moderate the fuel and reduce the subcriticality margin. The racks are constructed in accordance with the quality assurance requirements of Appendix B to 10 CFR Part 50 and are categorized as Safety Class 2 and Seismic Category I. The vault is in a concrete, Seismic Category I building that is designed to Regulatory Guides 1.13 and 1.29 which precludes the deleterious effects on the fuel in the NFV by natural phenomena such as earthquakes, tornados, hurricanes, tornado missiles, and floods. To prevent water moderation, there is a drain at the low point of the vault to remove water in the vault to prevent accumulation of water within the NFV and no fuel is placed in the vault if there is water in the vault. The licensee also has procedures to prevent the introduction of an optimum moderation inside the vault (e.g., using pressurized water fire extinguishers instead of foam for combating fires around fuel) which could decrease the subcriticality margin to a value greater than the design value of 0.05. Although the Technical Specifications for Grand Gulf do not specifically limit the enrichment of the fuel onsite including the NFV, the k-effective for spent fuel or new fuel in the fuel racks and submerged in water is limited to 0.95 by the Technical

Specifications and the enrichment of the fuel onsite is limited because the k-effective for the NFV is not allowed to be greater than 0.95. The fuel enrichment is a contributor to the value of k-effective. Therefore, the design of the NFV will preclude inadvertent criticality of the new fuel in the vault.

Therefore, based on the licensee's letters and the staff's evaluation, the Commission concludes that good cause exists for granting an exemption to the criticality monitoring requirements of 10 CFR 70.24(a) in storage areas for (1) in-core instrumentation detectors which are not in use and (2) unirradiated fuel stored in the NFV. Based on the information provided by the licensee, there is reasonable assurance that the nuclear instrumentation and unirradiated fuel will remain subcritical during handling and storage in areas where critically accident monitors required by 10 CFR 70.24(a) are not present. Additionally, all fuel storage and handling areas will continue to be monitored to detect conditions that may result in excessive radiation levels as required by General Design Criterion 63.

IV.

For the foregoing reasons, pursuant to 10 CFR 70.24(d), the NRC staff has determined that good cause has been shown for granting an exemption to the criticality monitoring requirements of 10 CFR 70.24(a).

Accordingly, the Commission has determined that, pursuant to 10 CFR 70.14, an exemption is authorized by law, will not endanger life or property or common defense and security, and is otherwise in the public interest. Therefore, with the total amount of SNM contained in the in-core

nuclear instruments less than a critical mass, as defined by Section 1.1 of Regulatory Guide 10.3 (Revision 1, dated April 1977), with the unirradiated fuel assemblies only removed from the NRC-approved metal containers in areas where criticality monitors are present, and with administrative controls to prevent optimum moderation of the unirradiated fuel in the NFV, the Commission hereby grants Entergy Operations, Inc. an exemption from the criticality monitoring requirements of 10 CFR 70.24(a) for the storage of not-in-use in-core nuclear instrumentation and of unirradiated fuel in the NFV.

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 (62 FR 55837). This exemption is effective upon issuance.

Dated at Rockville, Maryland, this 31st day of October 1997.

FOR THE NUCLEAR REGULATORY COMMISSION

Samuel J. Collins, Director
Office of Nuclear Reactor Regulation

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

January 30, 1998

Mr. George A. Hunger, Jr.
Director-Licensing, MC 62A-1
PECO Energy Company
Nuclear Group Headquarters
Correspondence Control Desk
P.O. Box No. 195
Wayne, PA 19087-0195

SUBJECT: ISSUANCE OF EXEMPTION FROM THE REQUIREMENTS OF 10 CFR 70.24, LIMERICK GENERATING STATION, UNIT 1 (TAC NO. MA0327)

Dear Mr. Hunger:

By letter dated December 23, 1997, the Philadelphia Electric Company requested an exemption from certain requirements of 10 CFR 70.24 concerning criticality monitors.

Based upon the information provided, there is reasonable assurance that irradiated and unirradiated fuel will remain subcritical; furthermore, you maintain radiation monitors in accordance with General Design Criterion (GDC) 63. The low probability of a criticality together with your adherence to GDC 63 constitutes good cause for granting an exemption from 10 CFR 70.24(a).

The U.S. Nuclear Regulatory Commission, pursuant to 10 CFR 70.14, has issued the enclosed exemption for Limerick Generating Station, Unit 1. A copy of the exemption is being forwarded to the Office of Federal Register for publication.

This completes our effort on this issue and we are, therefore, closing out TAC No. MA0327.

Sincerely,

Bartholomew C. Buckley

Bartholomew C. Buckley, Senior Project Manager
Project Directorate I-2
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Docket No. 50-352

Enclosure: Exemption

cc w/encl: See next page

cc:

J. W. Durham, Sr., Esquire
Sr. V.P. & General Counsel
PECO Energy Company
2301 Market Street
Philadelphia, PA 19101

Manager-Limerick Licensing, 62A-1
PECO Energy Company
965 Chesterbrook Boulevard
Wayne, PA 19087-5691

Mr. Walter G. MacFarland, Vice President
Limerick Generating Station
Post Office Box A
Sanatoga, PA 19464

Plant Manager
Limerick Generating Station
P.O. Box A
Sanatoga, PA 19464

Regional Administrator, Region I
U.S. Nuclear Regulatory Commission
475 Allendale Road
King of Prussia, PA 19406

Senior Resident Inspector
U.S. Nuclear Regulatory Commission
Limerick Generating Station
P.O. Box 596
Pottstown, PA 19464

Director-Site Support Services
Limerick Generating Station
P.O. Box A
Sanatoga, PA 19464

Chairman
Board of Supervisors
of Limerick Township
646 West Ridge Pike
Linfield, PA 19468

Chief-Division of Nuclear Safety
PA Dept. of Environmental Resources
P.O. Box 8469
Harrisburg, PA 17105-8469

Director-Site Engineering
Limerick Generating Station
P.O. Box A
Sanatoga, PA 19464

Manager-Experience Assessment
Limerick Generating Station
P.O. Box A
Sanatoga, PA 19464

Library
U.S. Nuclear Regulatory Commission
Region I
475 Allendale Road
King of Prussia, PA 19406

Senior Manager-Operations
Limerick Generating Station
P.O. Box A
Sanatoga, PA 19464

Dr. Judith Johnsrud
National Energy Committee
Sierra Club
433 Orlando Avenue
State College, PA 16803

7590-01-P

UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

In the Matter of	)	
	)	
PHILADELPHIA ELECTRIC COMPANY	)	Docket No. 50-352
	)	
(Limerick Generating Station, Unit 1)	)	

EXEMPTION

I.

The Philadelphia Electric Company (the licensee) is the holder of Facility Operating License No. NPF-39, which authorizes operation of the Limerick Generating Station (LGS), Unit 1. 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.

The facility consists of two boiling-water reactors at the licensee's site located in Montgomery and Chester Counties, Pennsylvania.

II.

Section 70.24 of Title 10 of the CODE OF FEDERAL REGULATIONS, "Criticality Accident Requirements," requires that each licensee authorized to possess special nuclear material (SNM) shall maintain a criticality accident monitoring system in each area where such material is handled, used, or stored. Subsections (a)(1) and (a)(2) of 10 CFR 70.24 specify 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 SNM is handled, used, or stored and provides that (1) the procedures ensure that all personnel withdraw to an area of safety upon the sounding of a criticality accident monitor alarm, (2) the procedures must include drills to familiarize personnel with the evacuation plan, and (3) 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 SNM 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 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 SNM that could be assembled into a critical mass at LGS, Unit 1, is in the form of nuclear fuel; the quantity of SNM other than fuel that is stored on site in any given location 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 LGS, Unit 1, and has determined that it is extremely unlikely for such an accident to occur if the licensee meets the following seven criteria:

1. Only three new fuel assemblies are allowed out of a shipping cask or storage rack at one time.
2. The k-effective does not exceed 0.95, at a 95% probability, 95% confidence level in the event that the fresh fuel storage racks are filled with fuel of the maximum permissible U-235 enrichment and flooded with pure water.
3. If optimum moderation occurs at low moderator density, then the k-effective does not exceed 0.98, at a 95% probability, 95% confidence level in the event that the fresh fuel storage racks are filled with fuel of the maximum permissible U-235 enrichment and flooded with a moderator at the density corresponding to optimum moderation.
4. The k-effective does not exceed 0.95, at a 95% probability, 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 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 limited to 5.0 weight percent.

By letter dated December 23, 1997, the licensee requested an exemption from 10 CFR 70.24. In this request the licensee addressed the seven criteria given above. The Commission's technical staff has reviewed the licensee's submittals and has determined that LGS, Unit 1 meets the applicable criteria. Criteria 2 and 3 are not applicable to LGS, Unit 1 since it has no fresh

fuel strorage racks, for prevention of inadvertent criticality; therefore, the staff has determined that it is extremely unlikely for an inadvertent criticality to occur in SNM handling or storage areas at LGS, Unit 1.

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 SNM, personnel would be alerted to that fact and would take appropriate action. The staff has determined that it is extremely unlikely that such an accident could occur; furthermore, the licensee has radiation monitors, as required by General Design Criterion 63, in fuel storage and handling areas. These monitors will 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 General Design Criterion 63, constitutes good cause for granting an exemption to the requirements of 10 CFR 70.24(a).

IV.

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 the Philadelphia Electric Company, an exemption from the requirements of 10 CFR 70.24(a) for Limerick Generating Station, Unit 1.

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 4497).

This exemption is effective upon issuance.

Dated at Rockville, Maryland, this 30th day of January 1998.

FOR THE NUCLEAR REGULATORY COMMISSION

Samuel J. Collins, Director
Office of Nuclear Reactor Regulation

Mr. J.P. O'Hanlon
Senior Vice President - Nuclear
Virginia Electric and Power Company
Innsbrook Technical Center
5000 Dominion Blvd.
Glen Allen, Virginia 23060

August 21, 1997

SUBJECT: ISSUANCE OF EXEMPTION FROM THE REQUIREMENTS OF 10 CFR 70.24(a) - SURRY POWER STATION (TAC NOS. M97904 and M97905)

Dear Mr. O'Hanlon:

By letter dated January 28, 1997, as supplemented March 24, 1997, you requested an exemption from the requirements of 10 CFR 70.24(a) concerning criticality monitors as pertaining to unirradiated fuel and other forms of special nuclear materials.

Based upon the information provided, there is reasonable assurance that irradiated and unirradiated fuel will remain subcritical during handling and storage; furthermore, you maintain radiation monitors in accordance with General Design Criterion (GDC) 63. The low probability of a criticality together with your adherence to GDC 63 constitutes good cause for granting an exemption from 10 CFR 70.24(a).

The Commission, pursuant to 10 CFR 70.14, has issued the enclosed Exemption for Surry Nuclear Power Station, Unit 1 and Unit 2. The enclosed Safety Evaluation documents the NRC staff's review of this issue. The exemption is being forwarded to the Office of the Federal Register for publication.

Sincerely,

Original signed by:

Gordon Edison, Senior Project Manager
Project Directorate I-1
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Docket Nos. 50-280
and 50-281

Enclosures: 1. Exemption
2. Safety Evaluation

cc w/encl: See next page

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cc:
Mr. Michael W. Maupin, Esq.
Hunton and Williams
Riverfront Plaza, East Tower
951 E. Byrd Street
Richmond, Virginia 23219

Mr. David Christian, Manager
Surry Power Station
Virginia Electric and Power Company
5570 Hog Island Road
Surry, Virginia 23883

Senior Resident Inspector
Surry Power Station
U. S. Nuclear Regulatory Commission
5850 Hog Island Road
Surry, Virginia 23883

Chairman
Board of Supervisors of Surry County
Surry County Courthouse
Surry, Virginia 23683

Dr. W. T. Lough
Virginia State Corporation
Commission
Division of Energy Regulation
P. O. Box 1197
Richmond, Virginia 23209

Regional Administrator, Region II
U. S. Nuclear Regulatory Commission
Atlanta Federal Center
61 Forsyth Street, SW, Suite 23T85
Atlanta, Georgia 30303

Robert B. Strobe, M.D., M.P.H.
State Health Commissioner
Office of the Commissioner
Virginia Department of Health
P.O. Box 2448
Richmond, Virginia 23218

Office of the Attorney General
Commonwealth of Virginia
900 East Main Street
Richmond, Virginia 23219

Mr. M. L. Bowling, Manager
Nuclear Licensing & Operations
Support
Innsbrook Technical Center
Virginia Electric and Power Company
5000 Dominion Blvd.
Glen Allen, Virginia 23060

Mr. Al Belisle
U.S. Nuclear Regulatory Commission
Atlanta Federal Center
61 Forsyth St., SW, Suite 23T85
Atlanta, Georgia 30303

Mr. W. R. Matthews, Manager
North Anna Power Station
P. O. Box 402
Mineral, Virginia 23117

7590-01-P

UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

In the Matter of	)	
	)	
VIRGINIA ELECTRIC AND POWER COMPANY	)	Docket Nos. 50-280 and 50-281
	)	
	)	
Surry Nuclear Power Station	)	

EXEMPTION

I.

The Virginia Electric and Power Company (VEPCO, the licensee) is the holder of Facility Operating License No. DPR-32 and Facility Operating License No. DPR-37, which authorize operation of the Surry Nuclear Power Station, Units 1 and 2. The licenses provide 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 two pressurized-water reactors at the licensee's site located in Surry County, Virginia.

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(c) 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.

By letter dated January 27, 1997, as supplemented March 24, 1997, VEPCO requested an exemption from 10 CFR 70.24(a). The Commission has reviewed the licensee's submittal and has determined that inadvertent criticality is not likely to occur in special nuclear materials handling or storage areas at Surry Nuclear Station, Units 1 and 2. The quantity of special nuclear material other than fuel that is stored on site is small

enough to preclude achieving a critical mass.

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 such an accident is not likely to occur, the licensee has radiation monitors, as required by General Design Criteria 63, in fuel storage and handling areas. These monitors will 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 General Design Criterion 63 constitute good cause for granting an exemption to the requirements of 10 CFR 70.24(a).

IV.

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 the following exemption:

The Virginia Electric and Power Company is exempt from the requirements of 10 CFR 70.24(a) for the Surry Nuclear Power Station, Unit 1 and Unit 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 (62 FR 44495).

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 21st day of August 1997.

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
RELATING TO REQUEST FOR EXEMPTION FROM 10 CFR 70.24(a)
VIRGINIA ELECTRIC AND POWER COMPANY
SURRY POWER STATION UNITS 1 AND 2
DOCKET NO. 50-280 & 50-281

1.0 INTRODUCTION

By letter dated January 28, 1997, as supplemented March 24, 1997, the licensee requested an exemption from the requirements of 10 CFR 70.24(a). The Commission has reviewed the licensee's submittal and has determined that procedures and design features make an inadvertent criticality in special nuclear materials handling or storage at Surry unlikely, in accordance with General Design Criterion 62, as described below.

2.0 EVALUATION

The Code of Federal Regulations at 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, a criticality accident monitoring system "using gamma- or neutron-sensitive radiation detectors which will energize clearly audible alarm signals if accidental criticality occurs." Subsection (a)(1) and (a)(2) of 10 CFR 70.24 specify the detection, sensitivity, and coverage capabilities of the monitors required by 10 CFR 70.24(a). Subsection (a)(3) of 10 CFR 70.24 requires that the licensee shall 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 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. Subsection (d) of 10 CFR 70.24 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.

The purpose of 10 CFR 70.24(a), (a)(2), and (a)(3) is to ensure that any inadvertent criticality is detected and that action is taken to protect personnel and correct the problem. By letter dated January 28, 1997, as supplemented March 24, 1997, the licensee requested an exemption from the requirements of 10 CFR 70.24(a). The licensee proposes to handle and store the unirradiated fuel and other special nuclear material without having either the criticality monitoring system or the emergency procedures specified in 10 CFR 70.24. The licensee believes that procedures and design features make an inadvertent criticality unlikely, in accordance with General Design Criterion 62.

Special nuclear material, as nuclear fuel, is stored in the spent fuel pool and the new fuel storage area. 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. New fuel is stored dry (in air) in the new fuel storage area.

Special nuclear material is also present in the form of fissile material incorporated into nuclear instrumentation. The small quantity of special nuclear material present in these items precludes an inadvertent criticality.

Consistent with Technical Specification Section 5.4, the spent fuel pool is designed to store the fuel in a geometric array that precludes criticality. The spent fuel racks are designed such that the effective neutron multiplication factor, k_{eff}, will remain ≤ 0.95 under all normal and accident conditions for fuel of maximum nominal enrichment of 4.1 wt% U-235. The staff has found this design adequate.

The new fuel storage area is 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 nominal enrichment of 4.1 wt% U-235 for the new fuel assemblies results in a maximum $k_{eff} \leq 0.95$ under conditions of accidental flooding by unborated water, and $k_{eff} \leq 0.98$ under conditions of low-density optimum moderation. The staff has found the design of the licensee's new fuel storage racks to be adequate to store fuel enriched to 4.1 wt% U-235.

Nuclear fuel is moved between the shipping container, the new fuel storage racks, the reactor vessel, and the spent fuel pool to accommodate refueling operations. In all cases, fuel movements are procedurally controlled and designed to preclude conditions involving criticality concerns. The fuel handling equipment used to unload and transfer the new fuel assemblies from the shipping containers to the storage racks precludes handling more than one fuel assembly at a time.

Procedures and controls prevent an inadvertent criticality during fuel handling; nevertheless radiation monitoring, as required by General Design Criterion 63, is provided in the new fuel storage area. An area radiation monitor is provided in the new fuel storage area and a second radiation monitor is provided on the fuel pit bridge crane. These required radiation monitors have associated area alarms and control room annunciators and would detect excessive radiation levels.

Training is required of all nuclear employees prior to receiving a badge to enter the nuclear power station. Nuclear employee retraining is provided annually to nuclear workers thereafter. This training provides those individuals having access to the Radiological Control Area direction regarding their required response upon hearing an alarm associated with an area radiation monitor.

The purpose of 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 reasonable and satisfactory precautions exist to preclude a nuclear criticality accident, thereby meeting the requirements of General Design Criterion 62, the licensee has radiation monitors, as required by General Design Criterion 63, in fuel storage and handling areas. These monitors will 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 General Design Criterion 63 and radiation worker training constitute good cause for granting an exemption to the requirements of 10 CFR 70.24(a).

3.0 CONCLUSION

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(a) are met because criticality is extremely unlikely with the present design configuration, TS requirements, administrative controls, and the fuel handling equipment and procedures. Therefore, the staff concludes that the licensee's request for an exemption from the requirements of 10 CFR 70.24(a) is acceptable and should be granted.

Principal Contributor: L. Kopp

Dated: August 21, 1997

Mr. S. K. Gambhir
Division Manager - Engineering & Operations Support
Omaha Public Power District
Fort Calhoun Station FC-2-4 Adm.
Post Office Box 399
Hwy. 75 - North of Fort Calhoun
Fort Calhoun, Nebraska 68023-0399

SUBJECT: ISSUANCE OF EXEMPTION FROM THE REQUIREMENTS OF 10 CFR 70.24 - FORT CALHOUN STATION, UNIT NO. 1 (TAC NO. M99544)

Dear Mr. Gambhir:

By letter dated August 29, 1997, as supplemented by letter date October 23, 1997, Omaha Public Power District requested an exemption from the requirements of 10 CFR 70.24 concerning criticality monitors.

Based upon the information provided, there is reasonable assurance that irradiated and unirradiated fuel will remain subcritical; furthermore, you maintain radiation monitors in accordance with General Design Criterion (GDC) 63. The low probability of a criticality together with your adherence to GDC 63 constitute good cause for granting an exemption from 10 CFR 70.24.

The U.S. Nuclear Regulatory Commission, pursuant to 10 CFR 70.14, has issued the enclosed exemption for Fort Calhoun Station, Unit No. 1. A copy of the exemption is being forwarded to the Office of Federal Register for publication.

Sincerely,
Original Signed by Mel Fields for
L. Raynard Wharton, Project Manager
Project Directorate IV-2
Division of Reactor Projects - III/IV
Office of Nuclear Reactor Regulation

Docket No. 50-285

Enclosure: Exemption

cc w/encl: See next page

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cc w/encl:
Winston & Strawn
ATTN: Perry D. Robinson, Esq.
1400 L Street, N.W.
Washington, DC 20005-3502

Mr. Jack Jensen, Chairman
Washington County Board
of Supervisors
Blair, Nebraska 68008

Mr. Wayne Walker, Resident Inspector
U.S. Nuclear Regulatory Commission
Post Office Box 309
Fort Calhoun, Nebraska 68023

Regional Administrator, Region IV
U.S. Nuclear Regulatory Commission
611 Ryan Plaza Drive, Suite 1000
Arlington, Texas 76011

Ms. Cheryl Rodgers, LLRW Program Manager
Environmental Protection Section
Nebraska Department of Health
301 Centennial Mall, South
P.O. Box 95007
Lincoln, Nebraska 68509-5007

Mr. James W. Chase, Manager
Fort Calhoun Station
Post Office Box 399
Fort Calhoun, Nebraska 68023

Mr. James W. Tills
Manager - Nuclear Licensing
Omaha Public Power District
Fort Calhoun Station FC-2-4 Adm.
Post Office Box 399
Hwy. 75 - North of Fort Calhoun
Fort Calhoun, Nebraska 68023-0399

7590-01-P

UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

In the Matter of	)	
	)	
OMAHA PUBLIC POWER DISTRICT	)	Docket No. 50-285
	)	
Fort Calhoun Station, Unit No. 1	)	

EXEMPTION

I.

The Omaha Public Power District (OPPD) is the holder of Facility Operating License No. DPR-40 for the Fort Calhoun Station, Unit No. 1 (FCS), which authorizes operation of the Fort Calhoun Station, Unit No. 1. 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.

The facility consists of a pressurized water reactor at the licensee's site located in Washington County, Nebraska.

II.

Section 70.24 of Title 10 of the Code of Federal Regulations, "Criticality Accident requirements," requires that each licensee authorized to possess special nuclear material (SNM) shall maintain a criticality accident monitoring system in each area where such material is handled, used, or stored. Subsections (a)(1) and (a)(2) of 10 CFR 70.24 specify 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 SNM is handled, used, or stored and provides that (1) the procedures ensure that all personnel withdraw to an area of safety upon the sounding of a criticality accident monitor alarm, (2) the procedures must include drills to familiarize personnel with the evacuation plan, and (3) 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 SNM 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 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 SNM that could be assembled into a critical mass at FCS is in the form of nuclear fuel. In addition, the quantity of SNM other than fuel that is stored on site in any given location is small enough to preclude achieving a critical mass. As set forth below, the Commission's technical staff has evaluated the possibility of an inadvertent criticality of the nuclear fuel at FCS.

By letter dated August 29, 1997, as supplemented by letter dated October 23, 1997, the licensee requested an exemption from the requirements of 10 CFR 70.24 in its entirety for FCS. The licensee proposes to handle and store unirradiated fuel without having a criticality monitoring system with the sensitivity required by 10 CFR 70.24.

The basis for the staff to determine that inadvertent or accidental criticality is extremely unlikely can be established through compliance with the FCS 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.

SNM, as nuclear fuel, is stored in the new fuel storage rack and in the spent fuel pool. The spent fuel pool is used to store irradiated fuel under water after its discharge from the reactor and new (unirradiated) fuel prior to loading into the reactor. New fuel is stored in the new fuel storage rack in a dry condition.

SNM is also present in the form of excore fission chamber detectors and startup neutron sources. The small quantity of SNM 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 for fuel enriched to 4.5 wt% U-235. 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 onsite and prior to loading in the reactor or spent fuel pool. The spacing between new fuel assemblies and the solid neutron absorbers in the storage racks is sufficient to

maintain the dry array in a subcritical condition. The new fuel storage rack is located at an elevation of 18.75 feet above the main floor which provides adequate drainage and precludes flooding. Because no fire protection sprinkler system exists in this area, there is no source of low-density aqueous foam optimum moderation. The current approved maximum enrichment of 4.5 wt% U-235 for the new fuel assemblies results in a maximum k_{eff} of less than 0.90 under dry conditions.

Nuclear fuel is moved between the NRC-approved shipping containers, the new fuel storage racks, the reactor vessel, and the spent fuel pool to accommodate refueling operations. In all cases, fuel movements are procedurally controlled and designed to preclude conditions involving criticality concerns. For example, during new fuel receipt inspection, FCS fuel handling procedures allow a maximum of two fuel assemblies to be in the inspection stands in the receipt area (out of the shipping container and not in the new fuel storage rack). However, when installed in the inspection stands, both assemblies have an edge-to-edge separation distance in excess of 14 feet. This geometric spacing is well in excess of that maintained by the NRC-approved shipping container (approximately 3 inches). There are no sprinklers in the new fuel receipt/storage room and the use of fire fighting equipment is very unlikely since there are no combustible materials permanently stored in this room. Even if fire suppression water were introduced into the room, sufficient drainage exists to preclude potential moderation of new fuel assemblies. Therefore, because of the large physical separation of new fuel assemblies and the extremely unlikely event of any potential moderation, there is sufficient assurance that k_{eff} remains less than 0.95, thus precluding criticality.

FCS was licensed to the 70 General Design Criteria for Nuclear Power Plant Construction published as drafts in the Federal Register (32 FR 10213) on July 11, 1967. Draft

Criterion 18, Monitoring Fuel and Waste Storage, was met. As noted in Section 11.2.3 and Appendix G of the FCS Updated Safety Analysis Report, area monitoring of dose rates is supplied in the containment and auxiliary buildings, including the fuel storage areas. Local and control room alarms and indicators (not necessarily meeting the 10 CFR 70.24 sensitivity requirements) are provided to alert personnel to take appropriate action in the unlikely event of excessive radiation levels due to accidental criticality.

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 SNM, personnel would be alerted to that fact and would take appropriate action. In view of the above information, the staff has determined that it is extremely unlikely for an inadvertent criticality to occur in SNM handling or storage areas at FCS. Criticality is precluded with the present design configuration, Technical Specification requirements, administrative controls, and the fuel handling equipment and procedures. In addition, as described above, the licensee has radiation monitors, as required by General Design Criterion 63, in fuel storage and handling areas. These monitors will 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 General Design Criterion 63, constitutes good cause for granting an exemption to the requirements of 10 CFR 70.24.

IV.

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

Omaha Public Power District an exemption as described in Section II above from 10 CFR 70.24, "Criticality Accident Requirements" for the Fort Calhoun Station.

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 5821).

This exemption is effective upon issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

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

Dated at Rockville, Maryland,
this 6th day of February 1998

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

October 31, 1997

Mr. Joseph J. Hagan
Vice President, Operations GGNS
Entergy Operations, Inc.
P. O. Box 756
Port Gibson, MS 39150

SUBJECT: EXEMPTION FROM CRITICALITY ACCIDENT REQUIREMENTS IN 10 CFR 70.24(a) - GRAND GULF NUCLEAR STATION, UNIT 1 (TAC NO. M96177)

Dear Mr. Hagan:

The enclosed exemption, as requested in your application dated July 15, 1996, (GNRO-96/00082), and supplemented by letters dated March 7 and April 29, 1997, (GNRO-97/00021 and 00035), is from the criticality monitoring requirements of 10 CFR 70.24(a), "Criticality Accident Requirements." The exemption concerns the storage of special nuclear material (SNM) in the form of (1) in-core nuclear instrumentation (e.g., source range monitors) when not in use and (2) unirradiated fuel. For unirradiated fuel, the exemption was requested for unirradiated fuel that is packaged in accordance with 10 CFR Part 71, "Packaging and Transportation of Radioactive Material," while the fuel is taken from the shipping trucks to the spent fuel pool area to be removed from the packaging, and for unirradiated fuel that is stored in the new fuel vault (NFV). For this exemption, you have committed to have (1) the total quantity of SNM present in the nuclear instrumentation less than a critical mass and (2) the unirradiated fuel is only removed from the Part 71 packaging in areas where a criticality accident monitor system is in use. As stated in the letter dated March 7, 1997, you have administrative controls to prevent optimum moderation of the unirradiated fuel in the NFV.

The Commission has granted this Exemption pursuant to 10 CFR 70.14. A copy of the Exemption is being forwarded to the Office of the Federal Register for publication. In granting this exemption, the staff is relying on the above two commitments.

Sincerely,

Jack N. Donohew, Senior Project Manager
Project Directorate IV-1
Division of Reactor Projects III/IV
Office of Nuclear Reactor Regulation

Docket No. 50-416

Enclosure: Exemption

cc w/encl: See next page

7590-01-P

UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

In the Matter of ENTERGY OPERATIONS, INC. SYSTEM ENERGY RESOURCES, INC. SOUTH MISSISSIPPI ELECTRIC POWER ASSOCIATION ENTERGY MISSISSIPPI, INC. (Grand Gulf Nuclear Station, Unit 1)	)	Docket No. 50-416

EXEMPTION

I.

Entergy Operations, Inc. (the licensee) is the holder of Facility Operating License No. NPF-29, which authorizes operation of Grand Gulf Nuclear Station, Unit 1 (GGNS). The operating license provides, among other things, that the licensee is subject to all rules, regulations, and orders of the Nuclear Regulatory Commission (NRC or the Commission) now and hereafter in effect.

The facility is a General Electric boiling water reactor at the licensee's site in Claiborne County, Mississippi.

II.

Title 10 CFR 70.24, "Criticality Accident Requirements," paragraph (a) states, in part, that "Each licensee authorized to possess special nuclear material [SNM] in a quantity exceeding 700 grams of contained uranium-235, 520 grams of contained uranium-233, 450 grams of plutonium, 1,500 grams of

contained uranium-235 if no uranium enriched to more than 4 percent by weight of uranium-235 is present, 450 grams of any combination thereof, or one-half such quantities if massive moderators or reflectors made of graphite, heavy water or beryllium may be present, shall maintain in each area in which such licensed special nuclear material is handled, used, or stored, a monitoring system meeting the requirements of [10 CFR 70.24](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. This section is not intended to require underwater monitoring when special nuclear material is handled or stored beneath water shielding or to require monitoring systems when special nuclear material is being transported when packaged in accordance with the requirements of Part 71 [(i.e., 10 CFR Part 71, "Packaging and Transportation of Radioactive Material,")] of this chapter."

The licensee meets the quantity criteria in 10 CFR 70.24(a) and is, therefore, required to have a criticality accident monitoring system in each area in which SNM in any form is handled, used, or stored. The licensee has proposed an exemption to this requirement for the storage of two forms of SNM at the site: (1) not-in-use in-core nuclear instrumentation (e.g., source range monitors) and (2) onsite unirradiated fuel. For the unirradiated fuel, the exemption is requested for the following cases:

- The interval when the fuel, packaged for shipment to the site in accordance with 10 CFR Part 71, is taken from the shipping truck to the plant area where the Part 71 packaging is removed.

- The storage of the unirradiated fuel in the new fuel vault (NFV), instead of the spent fuel pool, after the packaging is removed.

The very small quantity of SNM present in the nuclear instrumentation is in the form of thin coatings within the instrumentation and the unirradiated fuel assemblies would only be removed from the NRC-approved packaging in areas where criticality monitors are in use, and stored in either the NFV or the spent fuel pool. The unirradiated fuel that is stored in the spent fuel pool would be monitored in accordance with 10 CFR 70.24(a), whereas there is not a criticality accident monitor in the NFV.

An exemption from 10 CFR 70.24(a) is required for the licensee to store SNM at the site and not have a criticality accident monitoring system for the storage areas.

III.

Pursuant to 10 CFR 70.14, "Specific exemptions," the Commission may, upon application of any interested person or upon its own initiative, grant such exemptions 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.

Pursuant to 10 CFR 70.24(d), any licensee who believes that good cause exists why it should be granted an exemption in whole or in part from the requirements of this section may apply to the Commission for such an exemption. Such application shall specify the reason for the relief requested.

By letter dated July 15, 1996, as supplemented by letters dated March 7 and April 29, 1997, the licensee requested an exemption from the monitoring requirements of 10 CFR 70.24(a) for the storage of these two forms of SNM at the site. In those letters, the licensee provided the justification and reasons for requesting the exemption. The licensee did not request an exemption to the performance requirements of a criticality accident monitoring system that are specified in 10 CFR 70.24(a)(1) or (a)(2).

A previous exemption from the provisions of 10 CFR 70.24 for the storage of SNM was granted for GGNS in the July 15, 1981, SNM License No. 1882. This exemption expired with the SNM license when the operating license was issued for GGNS because the exemption was not reissued at that time. Therefore, the licensee has requested an exemption from the criticality accident monitoring requirements of 10 CFR 70.24(a) specifically for the areas containing in-core instrumentation detectors (which are not in use) and unirradiated (fresh) fuel. For unirradiated fuel, the exemption is requested for the unirradiated fuel that is in NRC-approved packaging while the fuel is taken from the shipping trucks to the spent fuel pool area to be removed from the packaging, and for the unirradiated fuel that is stored in the NFV, instead of the spent fuel pool.

The principal form of SNM at GGNS is in the form of nuclear fuel. Other quantities of SNM are also used or stored at the facility in the form of fissile material incorporated into in-core nuclear instrumentation (e.g., source range monitors, intermediate range monitors, local power range monitors, and traversing in-core probes). The instrumentation is being stored

at the site within the security fence in different plant areas.

The SNM in the nuclear instrumentation is in small quantities in thin coatings applied to the inside of sealed fission chambers contained within the instruments. The licensee has stated that the total amount of SNM contained in the nuclear instruments meets the "forms not sufficient to form a critical mass" in Section 1.1 of Regulatory Guide 10.3, "Guide for the Preparation of Applications for Special Nuclear Material Licenses of Less Than Critical Mass Quantities," Revision 1, dated April 1977. Thus, the licensee has committed that the total amount of SNM contained within in-core nuclear instrumentation will be less than a critical mass. Therefore, the small quantity of SNM in the nuclear instrumentation precludes inadvertent criticality.

Unirradiated nuclear fuel is received at the site only in NRC-approved Part 71 packaging. The entire Part 71 packaging consists of two right rectangular boxes consisting of an outer wooden container surrounding a inner metal container housing the unirradiated fuel. There is only cushioning material between the two boxes. The containers are designed in accordance with a certificate of compliance for radioactive materials packages issued by the NRC, in this case for the shipment of unirradiated fuel assemblies. It is the inner metal container that ensures that a geometrically safe configuration of the fuel is maintained during transport, handling, storage, and accident conditions, and that the introduction of any moderating agents to the fuel is precluded due to its leak-tight construction. Criticality is precluded due to the construction of the package and the storage configuration of the fuel in the package. This is based on a criticality analysis of the Part 71 packaging which limits the number of such packages on a shipping truck.

The handling of unirradiated fuel at the site is governed by administrative and departmental procedures that specify New Fuel Processing and Criticality Rules to ensure that fuel is not inadvertently removed from the inner metal container until it is positioned in the fuel inspection area near the spent fuel pool of the auxiliary building where a criticality accident monitoring system meeting 70.24(a) is present. It is the metal container that is referred to when the licensee stated that the unirradiated fuel will only be removed from the NRC-approved packaging in the presence of a criticality accident monitoring system meeting 70.24(a).

The unirradiated fuel is brought onsite on shipping trucks. The wooden containers are removed from the inner metal containers, and the unirradiated fuel is lifted in the metal container to the 208-foot level of the auxiliary building, and adjacent to the cask washdown pit and NFV of the spent fuel pool area. Only one metal container is lifted at a time, and the crane and lifting equipment used for the lift are certified. The plant areas that the metal containers would be moved through were inspected during a visit to the site and it was determined that the areas have drains to prevent the possibility of submerging the metal containers under water and creating a possible criticality condition. The only practical plant area where the new fuel could be submerged in water to introduce moderation is the spent fuel pool and there are 70.24(a) monitors in that area.

In the spent fuel pool area, the fuel is removed from the containers, inspected and channeled, and then placed either in the spent fuel pool or the NFV. Currently the unirradiated fuel is placed only in the spent fuel pool and, while the fuel is in the spent fuel pool, it is monitored by a 70.24(a)

monitoring system; however unirradiated fuel may be stored inside the NFV and there is not a criticality accident monitor in the NFV. The design basis criticality margin requirements for the NFV is to maintain the unirradiated fuel in the vault at a subcriticality margin of at least 0.05 (i.e., a k effective no more than 0.95). The new fuel would be stored in racks that are designed to withstand all credible static and dynamic loadings to prevent damage and distortion of the racks, and to maintain the design subcriticality margin of 0.05 whether the vault is dry or flooded with unborated water, because unborated water would moderate the fuel and reduce the subcriticality margin. The racks are constructed in accordance with the quality assurance requirements of Appendix B to 10 CFR Part 50 and are categorized as Safety Class 2 and Seismic Category I. The vault is in a concrete, Seismic Category I building that is designed to Regulatory Guides 1.13 and 1.29 which precludes the deleterious effects on the fuel in the NFV by natural phenomena such as earthquakes, tornados, hurricanes, tornado missiles, and floods. To prevent water moderation, there is a drain at the low point of the vault to remove water in the vault to prevent accumulation of water within the NFV and no fuel is placed in the vault if there is water in the vault. The licensee also has procedures to prevent the introduction of an optimum moderation inside the vault (e.g., using pressurized water fire extinguishers instead of foam for combating fires around fuel) which could decrease the subcriticality margin to a value greater than the design value of 0.05. Although the Technical Specifications for Grand Gulf do not specifically limit the enrichment of the fuel onsite including the NFV, the k-effective for spent fuel or new fuel in the fuel racks and submerged in water is limited to 0.95 by the Technical

Specifications and the enrichment of the fuel onsite is limited because the k-effective for the NFV is not allowed to be greater than 0.95. The fuel enrichment is a contributor to the value of k-effective. Therefore, the design of the NFV will preclude inadvertent criticality of the new fuel in the vault.

Therefore, based on the licensee's letters and the staff's evaluation, the Commission concludes that good cause exists for granting an exemption to the criticality monitoring requirements of 10 CFR 70.24(a) in storage areas for (1) in-core instrumentation detectors which are not in use and (2) unirradiated fuel stored in the NFV. Based on the information provided by the licensee, there is reasonable assurance that the nuclear instrumentation and unirradiated fuel will remain subcritical during handling and storage in areas where critically accident monitors required by 10 CFR 70.24(a) are not present. Additionally, all fuel storage and handling areas will continue to be monitored to detect conditions that may result in excessive radiation levels as required by General Design Criterion 63.

IV.

For the foregoing reasons, pursuant to 10 CFR 70.24(d), the NRC staff has determined that good cause has been shown for granting an exemption to the criticality monitoring requirements of 10 CFR 70.24(a).

Accordingly, the Commission has determined that, pursuant to 10 CFR 70.14, an exemption is authorized by law, will not endanger life or property or common defense and security, and is otherwise in the public interest. Therefore, with the total amount of SNM contained in the in-core

nuclear instruments less than a critical mass, as defined by Section 1.1 of Regulatory Guide 10.3 (Revision 1, dated April 1977), with the unirradiated fuel assemblies only removed from the NRC-approved metal containers in areas where criticality monitors are present, and with administrative controls to prevent optimum moderation of the unirradiated fuel in the NFV, the Commission hereby grants Entergy Operations, Inc. an exemption from the criticality monitoring requirements of 10 CFR 70.24(a) for the storage of not-in-use in-core nuclear instrumentation and of unirradiated fuel in the NFV.

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 (62 FR 55837). This exemption is effective upon issuance.

Dated at Rockville, Maryland, this 31st day of October 1997.

FOR THE NUCLEAR REGULATORY COMMISSION

Samuel J. Collins, Director
Office of Nuclear Reactor Regulation