



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

50-458

December 2, 1998

Mr. Randall K. Edington  
Vice President - Operations  
Entergy Operations, Inc.  
River Bend Station  
P. O. Box 220  
St. Francisville, LA 70775

SUBJECT: EXEMPTION FROM CRITICALITY ACCIDENT REQUIREMENTS - RIVER  
BEND STATION, UNIT 1 (TAC NO. M98877)

Dear Mr. Edington:

By letter dated May 15, 1997, Entergy Operations, Inc. (EOI) requested an exemption from the requirements of section 70.24(a) of Title 10 of the Code of Federal Regulations, "Criticality Accident Requirements," for the River Bend Station (RBS). 10 CFR 70.24 requires, in part, 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. The NRC requested on June 11, 1997 that RBS address seven criteria outlined in Information Notice (IN) 97-77, "Exemptions from the Requirements of Section 70.24 of Title 10 of the Code of Federal Regulations" in order to continue with the exemption process. IN 97-77 advised licensees that the staff had determined that it is extremely unlikely for a criticality accident to occur if these seven specific criteria were met, and provided further guidance on potential exemptions to 10 CFR 70.24 requirements.

On August 12, 1998, EOI superseded the original May 15, 1997 letter and requested an exemption from the criticality accident monitoring requirements stipulated in 10 CFR 70.24(a) specifically for the areas containing incore detectors (which are not in use) and unirradiated fuel while it is handled, used, or stored on site. The August 12, 1998 letter provided additional information regarding the seven criteria required for exemptions from the requirements of 10 CFR 70.24.

The staff has reviewed the licensee's submittal and has determined that RBS meets the applicable criteria, except for Criteria 1 and 3, presented below:

- Criterion 1: Plant procedures do not permit more than 3 BWR fuel assemblies to be in storage or in transit between their associated shipping cask and dry storage rack at one time.
- Criterion 3: If optimum moderation of fuel in the fresh fuel storage racks occurs when the fresh fuel storage racks are not flooded, the k-effective corresponding to this optimum moderation does not exceed 0.98, at a 95% probability, 95% confidence level.

The staff further concluded that, based upon the location, physical configuration and administrative controls associated with the movement and storage of fuel assemblies, the licensee will be able to maintain any array of fuel assemblies safely subcritical and that a

1/1  
DFU

9812140182 981202  
PDR ADOCK 05000458  
P PDR

NRC FILE 50-458-1001

CR3

Mr. Randall K. Edington

-2-

k-effective greater than 0.98 will not be attained. Therefore, River Bend's exception to Criteria 1 and 3 is acceptable.

Pursuant to 10 CFR 70.14, the NRC is granting the enclosed exemption for the River Bend Station, Unit 1. A copy of the exemption is being sent to the Office of the Federal Register for publication.

Sincerely,



Robert J. Fretz, Jr., Project Manager  
Project Directorate IV-1  
Division of Reactor Projects III/IV  
Office of Nuclear Reactor Regulation

Docket No. 50-458

Enclosure: Exemption

cc w/encl: See next page

Mr. Randall K. Edington

-2-

k-effective greater than 0.98 will not be attained. Therefore, River Bend's exception to Criteria 1 and 3 is acceptable.

Pursuant to 10 CFR 70.14, the NRC is granting the enclosed exemption for the River Bend Station, Unit 1. A copy of the exemption is being sent to the Office of the Federal Register for publication.

Sincerely,

**ORIGINAL SIGNED BY:**

Robert J. Fretz, Jr., Project Manager  
Project Directorate IV-1  
Division of Reactor Projects III/IV  
Office of Nuclear Reactor Regulation

Docket No. 50-458

Enclosure: Exemption

cc w/encl: See next page

DISTRIBUTION:

<del>██████████</del>	PUBLIC	PD4-1 r/f	
C. Hawes	R. Fretz	T. Gwynn, RIV	
ACRS	OGC (15B18)	E. Adensam (EGA1)	J. Hannon

Document Name: RB98877.LTR

OFC	PM/PD4-1	LA/PD4-1	SRXB/DSSA	OGC	PD/PD4-1
NAME	RFretz <i>RJF</i>	CHawes <i>CMH</i>	LKopp <i>LK</i>	<i>APH</i>	JHannon <i>JH</i>
DATE	10/6/98	10/6/98	10/13/98	10/13/98	11/6/98
COPY	<u>YES</u> /NO	YES/NO	YES/NO	YES/NO	<u>YES</u> /NO

OFFICIAL RECORD COPY

Mr. Randall K. Edington  
Entergy Operations, Inc.

River Bend Station

cc:

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

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

Manager - Licensing  
Entergy Operations, Inc.  
River Bend Station  
P. O. Box 220  
St. Francisville, LA 70775

General Manager - Plant Operations  
Entergy Operations, Inc.  
River Bend Station  
P. O. Box 220  
St. Francisville, LA 70775

Senior Resident Inspector  
P. O. Box 1050  
St. Francisville, LA 70775

Director - Nuclear Safety  
Entergy Operations, Inc.  
River Bend Station  
P. O. Box 220  
St. Francisville, LA 70775

President of West Feliciana  
Police Jury  
P. O. Box 1921  
St. Francisville, LA 70775

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

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

Attorney General  
State of Louisiana  
P. O. Box 94095  
Baton Rouge, LA 70804-9095

Ms. H. Anne Plettinger  
3456 Villa Rose Drive  
Baton Rouge, LA 70806

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

Administrator  
Louisiana Radiation Protection Division  
P. O. Box 82135  
Baton Rouge, LA 70884-2135

UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION

In the Matter of	)	
	)	
ENERGY GULF STATES, INC.	)	Docket No. 50-458
AND	)	
ENERGY OPERATIONS, INC.	)	
	)	
(River Bend Station, Unit 1)	)	

EXEMPTION

I.

Entergy Operations, Incorporated<sup>1</sup> (the Licensee), is the holder of Facility Operating License No. NPF-47, which authorizes operation of the River Bend Station, Unit 1 (RBS) (the facility). The license provides, among other things, that the facility is subject to all the rules, regulations, and orders of the U. S. Nuclear Regulatory Commission now or hereafter in effect.

The RBS, is a boiling-water nuclear reactor located approximately 2 miles east of the Mississippi River in West Feliciana Parish, Louisiana, approximately 2.7 miles southeast of St. Francisville, Louisiana and approximately 18 miles northwest of the city limits of Baton Rouge, Louisiana.

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

---

<sup>1</sup> Entergy Operations, Incorporated is authorized to act as agent for Entergy Gulf States, Inc. and has exclusive responsibility and control over the physical construction, operation and maintenance of the facility.

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 Commission's technical staff has evaluated the possibility of an inadvertent criticality of the nuclear fuel at River Bend Station (RBS), and has determined that it is extremely unlikely for such an accident to occur if the licensee meets the following seven criteria:

1. Plant procedures do not permit more than 3 BWR fuel assemblies to be in storage or in transit between their associated shipping cask and dry storage rack at one time.

2. The k-effective of the fresh fuel storage racks filled with fuel of the maximum permissible U-235 enrichment and flooded with pure water does not exceed 0.95, at a 95% probability, 95% confidence level.
3. If optimum moderation of fuel in the fresh fuel storage racks occurs when the fresh fuel storage racks are not flooded, the k-effective corresponding to this optimum moderation does not exceed 0.98, at a 95% probability, 95% confidence level.
4. The k-effective of spent fuel storage racks filled with fuel of the maximum permissible U-235 enrichment and flooded with pure water does not exceed 0.95, at a 95% probability, 95% confidence level.
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 May 15, 1997, Entergy Operations, Inc. (EOI) requested an exemption from the requirements of section 70.24(a) of Title 10 of the Code of Federal Regulations, "Criticality Accident Requirements," for the River Bend Station (RBS). On June 11, 1997, the NRC requested that RBS address the seven criteria published in Information Notice 97-77, "Exemptions from the Requirements of Section 70.24 of Title 10 of the Code of Federal Regulations" in order to continue with the exemption process.

On August 12, 1998, EOI superseded its original May 15, 1997, letter and requested an exemption from the criticality accident monitoring requirements stipulated in 10 CFR 70.24(a)

specifically for the areas containing incore detectors (which are not in use) and unirradiated fuel while it is handled, used, or stored on site.

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, except for Criteria 1 and 3 discussed below, RBS meets the applicable criteria.

RBS does not restrict fuel movement and storage of fuel assemblies that are out of their associated shipping cask to 3 assemblies. However, based on the elevation and configuration of the area where the assemblies are placed before storage into the new or spent fuel racks, the possibility of flooding is highly improbable. In addition, administrative controls are provided to restrict the fire-fighting practices employed in the fuel building to prevent low-density optimum moderation conditions. Fire-fighting foam is not permitted in the area and hose stations are equipped with straight-stream nozzles while handling fuel in the fuel building or storing fuel in the new fuel vault so that the array will not be covered with mist. Therefore, the staff concludes that any array of fuel assemblies in storage or in transit while outside of their associated shipping cask will be safely subcritical under the most adverse moderation conditions feasible, and the exception to Criterion 1 is acceptable.

Although the RBS new fuel racks are designed to maintain  $k$ -effective less than 0.95 when either dry or completely flooded with water, the new fuel racks cannot meet the 0.98  $k$ -effective limit under accident conditions of low-density optimum moderation (e.g., foam or mist). Therefore, solid, noncombustible, gasketed covers are provided over the new fuel vault to preclude the entrance of optimum moderation media. When these covers are removed for fuel handling, the fuel is covered by a fire retardant material to ensure that the storage array is not moderated by low-density moderation. As previously mentioned, administrative controls are also provided to prevent optimum moderation conditions in the new fuel vault so that the array



will not be covered with mist. Therefore, the staff concludes that a k-effective greater than 0.98 will not be attained in the new fuel storage racks and the exception to Criterion 3 is acceptable.

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 to the requirements of 10 CFR 70.24(a).

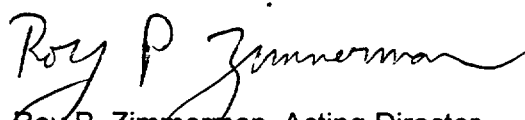
#### IV.

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 licensee an exemption from the requirements of 10 CFR 70.24 for the RBS.

Pursuant to 10 CFR 51.32, the Commission has determined that the granting of this exemption will not result in any significant adverse environmental impact (63 FR 63755).

This exemption is effective upon issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

  
Roy P. Zimmerman, Acting Director  
Office of Nuclear Reactor Regulation

Dated at Rockville, Maryland, this  
2nd day of December 1998.