



Entergy Operations, Inc.
River Bend Station
5485 U. S. Highway 61N
St. Francisville, LA 70775
Tel 225 381 4374
Fax 225 381 4872
eolson@entergy.com

Eric W. Olson
Site Vice President

RBG-47530

January 12, 2015

U. S. Nuclear Regulatory Commission
Attn.: Document Control Desk
Washington, DC 20555-0001

SUBJECT: Response to Request for Additional Information on License
Amendment Request 2013-13
River Bend Station – Unit 1
Docket No. 50-458
License No. NPF-47

REFERENCES: 1. Entergy letter to NRC, dated July 29, 2013, License
Amendment Request 2013-13, Heavy Load Movement Over Fuel
Assemblies (Letter No. RBG-47382)
2. NRC letter to Entergy (via email), dated December 16, 2014,
Request for Additional Information

RBF1-15-0001

Dear Sir or Madam:

On July 29, 2013, Entergy Operations, Inc. (Entergy) submitted a request to allow the movement of heavy loads over fuel assemblies (Reference 1). During their review, the NRC staff determined that additional information is needed to complete the processing and approval of Entergy's request. The request for that information was transmitted to Entergy per Reference 2. Attachments 1 and 2 to this letter contain the requested information. A licensee commitment is summarized in Attachment 3.

If you have any questions on this matter, please contact Joey Clark, Manager –
Regulatory Assurance, at 225-381-4177.

I declare under penalty of perjury that the foregoing is true and correct. Executed on
January 12, 2015.

Sincerely,

EWO/dhw

Attachment 1: Response to Request for Additional Information
Attachment 2: Revised Markups
Attachment 3: Licensee Commitment

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will



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cc: U. S. Nuclear Regulatory Commission
Attn: Mr. Alan Wang
MS 8-G14
One White Flint North
11555 Rockville Pike
Rockville, MD 20852

Regional Administrator
U. S. Nuclear Regulatory Commission
Region IV
1600 E. Lamar Blvd.
Arlington, TX 76011-4511

NRC Senior Resident Inspector
River Bend Station

Department of Environmental Quality
Office of Environmental Compliance
Radiological Emergency Planning and Response Section
Ji Young Wiley
P.O. Box 4312
Baton Rouge, LA 70821-4312

Public Utility Commission of Texas
1701 N. Congress Ave.
Austin, TX 78711-3326

Attachment 1
RBG-47530

Response to Request for Additional Information

RAI No. 1:

In your application dated July 29, 2013 (ADAMS Accession No. ML13214A334), it states:

The proposed changes add an exception to the movement of loads over the spent fuel pool. The exception is necessary to allow for movement of the spent fuel pool gates, which weigh more than the currently analyzed load over the spent fuel pool, for gate repair or replacement. The current NRC approved fuel handling accident (FHA) for River Bend station unit 1 accounts for 150 damaged fuel rods from a drop of a channeled spent fuel bundle onto unchanneled spent fuel in the spent fuel racks in the fuel building and includes a decay time of 24 hours. The FHA does not reflect dropping of a heavy load, such as the spent fuel pool gates, onto unchanneled spent fuel in the spent fuel racks in the fuel building.

Entergy is proposing to add a permanent exception to RBS TRM Section 3.9.14, "Crane Travel – Spent and New Fuel Storage, Transfer, and Upper Containment Fuel Pools," to allow for movement of fuel pool gates over fuel assemblies for maintenance. The exception will also be described by revision to UFSAR section 9.1.2.2.2, "Fuel Building Fuel Storage," and section 9.1.2.3.3, "Protection Features of Spent Fuel Storage Facilities." However, the proposed changes to the TRM 3.9.14 and UFSAR sections 9.1.2.2.2 and 9.1.2.3.3 do not reflect that the movement of the spent fuel pool gates is restricted to repair or replacement activities and therefore, would allow movement of the spent fuel pool gates at any time. This contradicts the application statements that say that this amendment is for spent fuel pool gate repair or replacement.

Explain if Entergy is requesting to move the spent fuel pool gates at any time or only for repair and replacement. If the spent fuel pool gates are going to be moved only for repair and replacement then provide the updated TRM and UFSAR sections that reflect this change, similar to those in Amendment Number 108 to RBS 1 Facility Operating License Number NPF-47 (ADAMS Accession Number ML003674610).

RESPONSE:

The only reasonably foreseeable causes for removing a gate from the pool are seal replacement (either as required by the preventative maintenance program, or for corrective maintenance following a seal failure) or emergent repairs to other door mechanisms (e.g., hinge bearings). See Attachment 2 for updated TRM and USAR mark-up pages.

RAI No. 2:

NUREG-0800, Standard Review Plan 15.0.1, "Radiological Consequence Analyses Using Alternative Source Terms," dated July 2000 (ADAMS Accession Number ML003734190), states, 2 in part that: The models, assumptions, and parameter inputs used by the licensee should be reviewed to ensure that the conservative design basis assumptions outlined in RG-1.183 have been incorporated. Appendix B of Regulatory Guide (RG) 1.183, "Alternative Radiological Source Terms for Evaluating Design Basis Accidents at Nuclear Power Reactors" (ADAMS Accession Number ML003716792), Regulatory Position 1.1 states, in part that: "The

number of fuel rods damaged during the accident should be based on a conservative analysis that considers the most limiting case.”

Entergy's letter dated September 23, 2014, (ADAMS Accession Number ML14272A185) to the NRC states:

As movement of the gates for the purposes of replacing the seals is typically scheduled to be performed during power operations, the dose analysis is based upon the assumption that the fuel impacted in the spent fuel pool has been subcritical for a minimum of 14 days (336 hours), which represents the minimum realistic refueling outage duration.

After reviewing the information submitted by Entergy, the NRC staff notes that the licensee has not provided an analysis that will provide the NRC Staff reasonable assurance that the FHA doses remain within regulatory limits (if a heavy load is moved over the spent fuel pool). The current FHA analysis accounts for 150 damaged fuel rods from a drop of a channeled spent fuel bundle onto unchanneled spent fuel in the spent fuel racks and includes a decay time of 24 hours. The load drop calculation for spent fuel pool gates predicts 266 damaged fuel rods and has a minimum of 14 days (336 hours) decay time. However, the requirement for a minimum of 14 days for decay prior to movement of the spent fuel pool gate has not been included in the RBS Facility Operating License. Therefore, since the RBS facility operating license does not place a restriction on moving heavy loads, or the minimum amount of decay time for heavy load movement, nor does it account for heavy loads in the current FHA, the NRC staff can not conclude that there is reasonable assurance of adequate protection and that the requested LAR does not create the possibility of a new or different kind of accident from those previously analyzed.

Provide a revised FHA that accounts for 266 damaged fuel rods with a decay time of 24 hours for NRC staff review, or provide a facility operating license restriction that ensures that spent fuel pool fuel assembly decay time of 14 days (336 hours) before a heavy load is allowed to be moved over the spent fuel pool.

RESPONSE:

Since the referenced dose analysis contains the assumption that all fuel in the pools will have undergone a 14-day decay period prior to any rigging of the gates, it is appropriate that such a condition be made a prerequisite for that activity. Prior to any rigging of the spent fuel pool gates, it will be verified that no fuel assembly in the pools has been part of a critical core within the preceding 14 days. (See Attachment 3)

Attachment 2
RBG-47530

Revised Mark-ups
(3 pages)

Technical Requirements Manual Page 3.9-9
Updated Safety Analysis Report Pages 9.1-12 and 9.1-22

(NOTE – New text added as part of this RAI response is underlined)

Except for movement of the spent fuel pool gates for repair or seal replacement,

Crane Travel - Spent and New Fuel Storage, Transfer and Upper Containment Fuel Pools
TR 3.9.14

TR 3.9.14 Crane Travel - Spent and New Fuel Storage, Transfer and Upper Containment Fuel Pools

TLCO 3.9.14 Loads in excess of 1200 pounds shall be prohibited from travel over fuel assemblies in the spent or new fuel storage, transfer or upper containment fuel pool racks and all loads shall be prohibited from travel over irradiated fuel when water level is < 23' over the irradiated fuel.

APPLICABILITY: With fuel assemblies in the spent or new fuel storage, transfer or upper containment fuel pools.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. With the requirements of the above specification not satisfied.	A.1 Place the crane load in a safe condition.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
TSR 3.9.14.1	The fuel building crane loads shall be verified to weigh less than or equal to 1200 pounds.	Before travel over fuel assemblies in the spent or new fuel storage pools and the lower transfer pools
TSR 3.9.14.2	The reactor building polar crane loads shall be verified to weigh less than or equal to 1200 pounds.	Before travel over fuel assemblies in the upper transfer and containment fuel pools

, except for movement of the spent fuel pool gates for repair or seal replacement.

The design of the racks precludes accidental insertion of the fuel assemblies between adjacent racks and ensures the required spacing and mechanical support of the neutron-absorbing material for reactivity control.

The fuel building spent fuel racks employ a fixed neutron absorber or poison material for criticality control. Boraflex II, manufactured by Brand Industrial Services, is used. This material has been tested in a fuel pool-like environment to $10^{(11)}$ rad and found to behave acceptably. Alteration in physical properties and off gassing due to irradiation and material chemical or galvanic interaction with the rack structure have been considered in the design of the racks.

The installation of the high density spent fuel storage racks is accomplished in two stages. The first stage includes the installation of 30 adapter plates welded to the floor embedment plates. These plates serve as supports for the racks providing both horizontal and vertical downward restraints. The second stage to be accomplished prior to the first refueling outage includes the installation of all 20 racks. Special tools are used for the initial alignment of adapter plates and leveling of racks. After installation is complete, pool can be flooded in preparation for storage of spent fuel assemblies.

•→10 •→8

Spent control rod blades are stored on permanently installed control rod blade storage racks, two to a hanger, on hooks at the 101' elevation of the spent fuel pool. Additional storage locations for control rod blades are also available via removable control rod blade storage racks mounted on the curb of the spent fuel pool. During control blade transit, the minimum required submergence is maintained at no less than 6 feet 9 inches. Once the spent control blade is resting on the hanger, the tops of the highest spent control blades in underwater storage are covered by a minimum of 10 feet of water.

8←• 10←•

•→8A •→2

•→1 •→13

The 15-ton fuel building bridge crane is used for the rack installation. Subsequent to the installation of the racks, the crane will be utilized for transporting only light loads over stored spent fuel. Administrative controls exist to prevent the transport of heavy loads over stored spent fuel.

1←• 13←•

2←• 8←• 8A←•

other than spent fuel pool gates.

, except for movement of the spent fuel pool gates for repair or seal replacement.

Since the fuel storage racks are made of noncombustible material and are stored under water, there is no potential fire hazard. The large water volume also protects the spent fuel storage racks from potential pipe breaks and associated jet impingement loads.

9.1.2.3.3 Protection Features of Spent Fuel Storage Facilities

•→13

1. The layout of the fuel handling areas around the fuel pool in the fuel building (Fig. 1.2-20 and 1.2-22) is designed such that the traversing of any heavy objects over stored spent fuel is precluded. The spent fuel cask pool and the spent fuel cask trolley are physically outside the boundaries of the fuel pool, with the only interconnection being a fuel transfer slot which is sealed by a watertight gate. Therefore, the spent fuel cask handling crane, which passes over the cask storage area, cannot in any way be traversed over any portion of the fuel pool.

13←•

In addition, the spent fuel cask trolley has a fixed main hoist, i.e., the hoist centerline is fixed between the runway rails with no capability for traversing between the runways. This arrangement precludes an off-center lowering of the spent fuel cask, and a vertical cask drop cannot impinge upon spent fuel racks.

The fixed main hoist arrangement also makes a cask drop at an angle unlikely. The consequences of a cask drop, at an angle or vertically, may result in local yielding and possible rupture of the cask pool liner. The watertight gate which is in the sealing position during cask transfer operations prevents loss of water from the spent fuel pool and no damage to the spent fuel results. No safety-related equipment is located near the spent fuel cask pool or near the spent fuel cask handling area.

•→8

During all cask handling operations, the watertight gate is closed, thus restricting any water loss resulting from the consequences of a cask drop accident and postulated damage to the cask storage area.

•←8

The only heavy objects that will be moved in the vicinity of stored spent fuel are the fuel pool gates, as required for repair or seal replacement. The load handling of the pool gates will be performed in accordance with the intent of NUREG-0612, NUREG-0554, RIS-2005-25, and RIS-2005-25, Supplement 1, for reducing the potential for an accidental load drop. The load associated with movement of pool gates is approximately 2500 pounds, which accounts for the weight of a gate plus the rigging. Prior to movement of the fuel pool gates, it will be verified that no fuel assembly in the pools has been part of a critical core within the previous 14 days.

Attachment 3
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Licensee Commitment

This table identifies actions discussed in this letter for which Entergy commits to perform. Any other actions discussed in this submittal are described for the NRC's information and are not commitments.

COMMITMENT	TYPE		Scheduled completion date
	One-time action	Continuing compliance	
Prior to any rigging of the spent fuel pool gates, it will be verified that no fuel assembly in the pools has been part of a critical core within the preceding 14 days.		x	Prior to any rigging of the spent fuel pool gates.