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RBG-47382

July 29, 2013

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

SUBJECT: License Amendment Request 2013-13
Heavy Load Movement Over Fuel Assemblies
River Bend Station – Unit 1
Docket No. 50-458
License No. NPF-47

RBF1-13-0083

Dear Sir or Madam:

In accordance with 10CFR50.59(c) and 10CFR50.90, Entergy Operations, Inc. (Entergy) hereby requests an amendment of Facility Operating License No. NPF-47, for River Bend Station (RBS). This request involves movement of a "heavy load" over fuel assemblies, and requires prior NRC approval.

The proposed change was reviewed against the criteria of 10CFR50.92, and was determined not to involve a significant hazards consideration. Attachment 1 provides a description of the proposed changes and the associated justification (including the determination of no significant hazards consideration). Attachment 2 contains the mark-up of affected pages reflecting the amendment being requested.

Entergy has reviewed this request against the criteria of 10CFR50.22 for environmental considerations. The proposed change does not involve a significant hazards consideration. Also, the type and amount of effluent released from RBS is not changed. Further, the amount of individual or cumulative occupational dose does not increase significantly as a result of this change. Therefore, based on the foregoing, Entergy has concluded that the proposed change meets the criteria given in 10CFR51.22(c)(9) for a categorical exclusion from the requirement for an Environmental Impact Statement. In accordance with 10CFR50.91, Entergy is notifying the State of Louisiana of this LAR by transmitting a copy of this letter and attachments to the designated state official.

Commitments contained in this letter are summarized in Attachment 5.

This request is neither emergency nor exigent, and Entergy requests approval of this change by July 29, 2014. Once approved, the amendment will be implemented within 60 days of issuance. If you have any questions regarding this request or require additional information, please contact Mr. Joey Clark at (225) 381-4177.

A001
NRR

I declare under penalty of perjury that the foregoing is true and correct. Executed on July 29, 2013.

Respectfully,

EWO/JAC/dhw

Attachments:

1. Evaluation of Proposed Change
2. Mark-up of Affected Pages
3. Load Path Sketch
4. Rigging Sketch
5. List of Commitments

cc: U. S. Nuclear Regulatory Commission
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U.S. Nuclear Regulatory Commission
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Attachment 1

RBG-47382

Evaluation of Proposed Changes

1. Summary Description

This amendment request proposes to add a permanent exception to River Bend Station Technical Requirements Manual (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. This exception will also be described by revision to Updated Safety Analysis Report (USAR) section 9.1.2.2.2, "Fuel Building Fuel Storage," and section 9.1.2.3.3, "Protection Features of Spent Fuel Storage Facilities."

2. Description Of Proposed Change

The proposed change would add a permanent exception to TR 3.9.14, allowing travel of loads in excess of 1200 pounds (hereafter referred to as "heavy loads") over fuel assemblies in the spent fuel storage pool. The exception would allow movement of the gates, provided we comply with the defense-in-depth recommendations, or take alternative compensatory measures, given in References 10.c through 10.f.

Corresponding sections of the RBS USAR will be revised to be consistent with the exception and to state that the provisions of References 10.c through 10.f are applicable to this activity. The approximate combined load of a gate and the rigging (approximately 2000 pounds) exceeds the analyzed load for travel over the spent fuel storage racks. In accordance with the guidance in Reference 10.g and 10CFR50.59, these changes are deemed to require prior NRC approval. Therefore, Entergy is submitting this request in accordance with 10CFR50.59(c) and 10CFR50.90.

3. RBS Current Licensing Basis

The fuel building fuel storage facilities consist of three separate but interconnected stainless steel-lined concrete pools (see Attachment 3). The spent fuel storage pool is the largest of these pools. Adjacent to the spent fuel storage pool are the cask pool and the lower inclined fuel transfer system pool. Each of these two pools is separated from the fuel storage pool by a full-height wall broken by a watertight gate. The watertight gates are normally open. These gates are closed to seal their respective pools during cask handling and equipment maintenance operations. The gates are designed as Seismic Category I structures to withstand all loads and loading combinations, as defined in Section 3.8 of the RBS USAR. The gates are equipped with inflatable pneumatic seals to provide the necessary watertight barrier.

Movement of heavy loads is precluded by restrictions in TR 3.9.14 from traveling over spent fuel assemblies in the fuel building spent fuel or upper containment fuel storage pool racks. Administrative controls impose limits on loads weighing more than 1200 pounds. These limits assure that, in the unlikely event of a load drop over fuel assemblies, offsite radiological consequences will not exceed Standard Review Plan section 15.7.4 guidelines.

USAR Section 9.1.2.2.2, "Fuel Building Storage," discusses the use of the 15-ton fuel building bridge crane for the high-density spent fuel rack installation. Subsequent to the installation of these racks, the crane is used only to move light loads over stored spent fuel. Administrative controls exist to prevent transport of heavy loads over stored spent fuel.

USAR Section 9.1.2.3.2.2, "Fuel Building Fuel Storage," describes the storage rack structure as being capable of withstanding the impact resulting from a falling object possessing 3800 foot-pounds kinetic energy. The structural design of the racks is such that under this impact force, no lateral displacement of fuel occurs; therefore, subcritical spacing is maintained.

USAR Section 9.1.4.3, "Safety Evaluation, Fuel Handling System," states that, for the fuel building, the kinetic energy of any dropped object does not exceed that of a channeled fuel assembly as described in USAR Section 15.7.4, with the exception of new fuel when being transported by the fuel building bridge crane.

During the original plant operating licensing process for RBS, the NRC reviewed the RBS program for control of heavy loads. In NUREG-0989, NRC Safety Evaluation Report for RBS, Supplement 2, the NRC Staff concluded that RBS implementation of the guidelines for Phase 1 of NUREG-0612 was acceptable and no further action for Phase 2 was required. RBS' commitment to the guidelines in NUREG-0612 was reiterated in response to NRC Bulletin 96-02, "Movement of Heavy Loads Over Spent Fuel, Fuel in the Reactor Core, or Over Safety Related Equipment." (See letter no. RBG-42916 from Entergy to NRC, dated August 29, 1996.)

RBS performed an assessment of Regulatory Issue Summary 2008-28, "Endorsement of Nuclear Energy Institute Guidance for Reactor Vessel Head Heavy Load Lifts." Gaps identified by that assessment were corrected, such that the station is now in compliance with that guidance.

4. Details of Proposed Changes to RBS Current Licensing Basis

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 seal replacement. Specific changes are as follows (revisions indicated by underline):

(a) TR 3.9.14, "Crane Travel, Spent and New Fuel Storage, Transfer, and Upper Containment Fuel Pools," will be changed as follows:

TLCO 3.9.14: <u>Except for movement of spent fuel pool gates</u>, 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.

TSR 3.9.14.1: The fuel building crane loads shall be verified to weigh less than or equal to 1200 pounds, except for movement of spent fuel pool gates.

(b) USAR Section 9.1.2.2.2, "Fuel Building Fuel Storage," will be changed to state, in part, the following:

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, except for the movement of spent fuel pool gates. Administrative controls exist to prevent the transport of heavy loads other than fuel pool gates over spent fuel.

(c) USAR Section 9.1.2.3.3, "Protection Features of Spent Fuel Storage Facilities," will be changed to state, in part, the following:

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 only heavy objects that will be moved in the vicinity of stored spent fuel are spent fuel pool gates, as required for repair or seal replacement. The load handling of the gates will be performed in accordance with the intent of NUREG-0612, NUREG-0554, RIS-2005-25, and RIS-2005-25 Supplement 1 guidelines for reducing potential for an accidental load drop. The load associated with movement of spent fuel pool gates is approximately 2500 pounds, which accounts for the weight of a gate plus the rigging. 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 that is sealed by a watertight gate. Therefore, the spent fuel cask handling crane, which passes over the cask storage area, cannot traverse over any portion of the fuel pool.

5. Technical Evaluation

The fuel building storage facilities consist of three interconnected stainless steel-lined concrete pools. The spent fuel storage pool is the largest of these pools. Adjacent to the fuel storage pool are the cask pool and the lower inclined fuel transfer system (IFTS) pool. Each of those pools is separated from the fuel storage pool by a full-height wall encompassing a watertight gate. The watertight gates are normally open. These gates are closed to seal their respective pools during dry fuel storage cask loading and equipment maintenance operations. The gates are designed as Seismic Category 1 structures to withstand all loads and loading combinations, as defined in Section 3.8 of the RBS USAR. The gates are equipped with inflatable pneumatic seals to provide the watertight barrier.

The RBS preventive maintenance program requires the gate seals to be replaced on a fourteen-year frequency. The due date for the next scheduled replacement is February 2014, and the late date is August 2017.

The NRC has issued guidance for controlling heavy loads in References 10.c through 10.f. The proposed changes will allow movement of a heavy load over spent fuel using

that guidance. The proposed method for conduct of the movements involves the use of two cranes to provide redundancy for the load. This method is described below. Plan drawing ES-062E (Attachment 3) is marked with the proposed pathway for the movement. The IFTS pool gate is designated on design documents as FNS-GATE1, and the cask pool gate is designated as FNS-GATE2.

5.1 Proposed method:

Neither of the two cranes is capable of traversing directly over the spent fuel gates. Based on a dry run of the cranes, the closest the bridge crane hook can be brought over the spent fuel gates is approximately 3'-2", and the closest the auxiliary hook of the spent fuel cask crane can be brought over the spent fuel gate is approximately 6'-0". Therefore, the horizontal distance between the two hooks will be approximately 9'-2".

a. Select all of the rigging equipment (slings, chains, hoists, shackles, etc.) for a minimum rated capacity of 5 tons.

b. Connect the rigging equipment to the lugs on the lifting beam and to the fuel building crane (MHF-CRN1) 15-ton hook and the fuel building cask crane (MHF-CRN2) 15-ton hook. Attachment 4 contains a sketch of the rigging assembly.

c. Move the cranes such that the centerline of the hooks is aligned with the centerline of FNS-GATE1.

d. Gate FNS-GATE1 is to be rigged first. Attach the lifting beam to the top of FNS-GATE1.

e. Using the lower hoist of the rigging mechanism, lift the gate enough to clear the hinges. Do not apply more than 3700 pounds of force for releasing the gate from its hinges.

f. After the initial lift, move the gate westward sufficiently to clear the hinges.

g. Move the gate northwards parallel to the east wall of the spent fuel pool by moving both the cranes simultaneously until the gate reaches the opening for FNS-GATE2.

h. Rotate the gate enough to be able to move it through the gate opening in the wall. Move the gate under the auxiliary hook of the cask crane by using the two upper hoists and ensuring that the bottom of the gate clears the bottom of the opening in the wall. At this position, the full load of the gate will be carried by the auxiliary hook of the cask crane.

i. Move the gate eastward to the center of the cask crane.

j. Raise the pool gate by raising the cask crane hook until the bottom of the gate is approximately 6" above the upper shelf in the cask pool.

k. Move the gate northward and place it on the floor close to the north wall with the upper part of the gate resting against the north wall. As a good practice, tie resting gate to pool handrails.

l. Reduce the length of the rigging above the gate by removing the hoists and dynamometer. Reattach the auxiliary hook of the Fuel Building Cask Crane.

m. Raise the gate to clear the floor or any obstructions by approximately 6" and move it to its laydown area.

n. Follow the above sequence in reverse order for reinstallation of the gate.

o. Perform rigging for FNS-GATE2, when required, in a manner similar to that outlined for FNS-GATE1.

The fuel building crane is seismically qualified for 2500 pounds. The redundant rigging using two cranes meets the requirement of References 10.c through 10.f.

Work instructions for gate maintenance will include the proposed load lift rigging plan and the safe load path for movement. Those steps were successfully executed in the last gate seal replacement, as approved in accordance with Reference 10.a. This LAR seeks to establish the previously approved rigging and movement plan as the normal plan for gate maintenance.

5.2 Justification:

a. Seismic Evaluation for the Fuel Building Bridge Crane

The actual combined weight of a gate plus the rigging components is approximately 2000 pounds. For the purposes of this change, the fuel building bridge crane was seismically evaluated for an increased rigging load of 2500 pounds. In accordance with NUREG-0554, Section 2.5, the maximum critical load (MCL) plus operational and seismically induced pendulum and swinging load effects on the crane should be considered. The crane was therefore qualified for 2500 pounds MCL and other seismically induced loads in order to use the crane for rigging the fuel pool gates.

b. Load Path for the rigging of the gates over the spent fuel pool

The safe load path for movement of the fuel pool gates has been defined.
The spent fuel pool gates weigh approximately 1600 pounds each. Single-failure-proof rigging is provided by lifting the gates using both MHF-CRN1, fuel building bridge crane, (lifting capacity, 15 tons), and the auxiliary hook of MHF-CRN2, spent fuel cask crane (lifting capacity, 15 tons). The fuel building crane has been qualified seismically to lift 2500 pounds. The use of the two cranes for lifting the gate will provide two separate load lift paths meeting the intent of the recommended use of single-failure proof crane. As such, in the event the holding mechanism of one crane fails, the other crane will be able to support the full load of the gate. Furthermore, to

prevent failure of the rigging components, additional redundancy is provided by using redundant load carrying slings and shackles (i.e. doubling each load carrying member of the rigging assembly shown in sketch). The transfer pool gate (FNS-GATE1) will be rigged first. The gate will be initially lifted approximately 12 inches to clear the hinges by applying no more than 3700 pounds in order to overcome friction force. The load will be distributed between the two cranes. The 3700-pound break away load is acceptable as the load is distributed between two cranes. Additionally in the unlikely event of a single failure of one crane, the load at this location could not adversely impact spent fuel. The gate is then moved westward into the spent fuel pool 6 to 12 inches away from the east wall. The gate will than travel a maximum of 11 feet horizontally, parallel to the east wall, by moving both the cranes simultaneously.

Once the gate reaches the opening for FNS-GATE2 (cask pool gate) it will be rotated enough to move through the opening into the cask pool. The gate is then moved under the auxiliary hook of the cask crane by lowering the bridge crane hook and raising the cask crane hook at the same time to ensure the bottom of the gate clears the bottom of the opening in the wall.

FNS-GATE2 will be rigged in the same manner as discussed above and travels a maximum of 4 feet horizontally, parallel to the east wall, until it aligns with the gate opening. When the gate is under the auxiliary hook the full load of the gate will be carried by the auxiliary hook of the cask crane..

The load drop analysis for new fuel indicates that there will be enough available space for the lift of the gate, and the impact on irradiated fuel due to dropping the gate will be minimized.

c. Failure Analysis

If the holding mechanism of the auxiliary hook of the cask crane fails, the gate will swing and finally rest under the bridge crane hook. Considering the worst case initial inclination of the bridge crane hook, the final location of the bottom of the gate will be lowered by no more than 1.5 feet, to an approximate elevation of 88'-6", which is 3'-10" above the top of the fuel racks at elevation 84'-7".

If the holding mechanism of the bridge crane fails, the gate will drop approximately 10" and swing under the auxiliary hook of the cask crane when the gate is aligned to clear the gate opening on the fuel pool wall. However if the holding mechanism failure occurs prior to gate alignment with wall opening, the gate will swing and impact the east wall of the spent fuel pool before its final resting position. Because of the inclination of the crane hook, there will be a horizontal component of the restraining force acting at top of the gate that will tend to move the gate under the hook. The gate will travel a maximum of 12" horizontal before initial impact that is likely to occur near the top of the 4" pool wall curb. The pool curb has a 6" high ½" thick continuous plate on the pool side of the curb. Also there is a 1/2" thick plate on top of the curb and a 4"x3"x1/4" angle on the back side. As such the applied impact load will not adversely affect the structural integrity of the pool wall. The capacity of

the 4" wide concrete curb for a concentrated load is calculated to be 1864 pounds. Therefore, the impact of the gate will not affect the structural integrity of the concrete wall or the curb. The gate will be slowly moved towards the north by moving the auxiliary cask crane hook till the gate reaches the opening for FNS-GATE2. The slow movement is to ensure that no significant damage is caused to the curb/liner plate of the pool or to the gate.

d. Evaluation of Existing Lugs and Gate Rigging Beam

RBS has evaluated the rigging components for 2/3 of the unhinging load. The calculations did not consider dynamic load as required by ASME B14.6. Thus, the lifting devices have been further evaluated for having adequate margin (safety margin of at least 10) by considering the static and dynamic loads.

The lifting beam designed for this task has a safety factor greater than 10.

e. Seismic Qualification Summary

The fuel building bridge crane was provided as primarily a construction crane and was not seismically designed. During the review of the fuel building bridge crane compliance with the guidelines of NUREG-0554 "Single-Failure-Proof Cranes for Nuclear Power Plants," it was discovered that the crane is seismically qualified for a 1200 pound load on the hook. The seismic qualification calculation shows that bolt stress on the end truck girder joints has a margin of 0.062. The calculation considers the calculated stress value to be conservative, because the modeling did not include any of the actual stiffening elements of the main girder.

The calculation assumes an additional 1000 pound load, yielding a bolt interaction ratio of 1.036. Due to the limited margin, the calculation was completed using a computerized analysis of the fuel building crane with limited and sufficient loading on the crane to lift the gates.

Furthermore, per NUREG-0554, Section 2.5 the maximum critical load (MCL), plus operational and seismically induced pendulum and swinging load effects on the crane should be considered. The crane was therefore qualified for 2500 pounds MCL and other seismically induced loads in order to use the crane for rigging the fuel pool gates. Seismic analysis of the fuel building crane for 2500 pounds of load has shown it to be seismically qualified to perform the lift.

f. Fuel Building Crane and the Fuel Building Cask Crane Auxiliary Hook

The fuel building bridge crane and the fuel building cask crane auxiliary hook are both qualified for 15 tons. They are more than technically qualified to lift the gates in the spent fuel pool.

6. Precedence

License Amendment Request 1999-31 (Reference 10.a) was submitted and processed on an exigent basis in support of refueling outage no. 9 following the failure of the IFTS gate seal approximately four months prior to the outage. That request was granted on a one-time basis as documented in Reference 10.b. It is now being requested that the exception for movement of the gates over fuel assemblies for maintenance be made permanent.

7. Regulatory Evaluation

Heavy loads are precluded by TR 3.9.14 from traveling over spent fuel assemblies in the fuel building spent fuel or upper containment fuel storage pool racks. Established administrative controls impose limits on loads weighing more than 1200 pounds. These limits assure that, in the unlikely event of a load drop over fuel assemblies, offsite radiological consequences will not exceed Standard Review Plan section 15.7.4 guidelines. USAR Section 9.1.2.2, "Fuel Building Storage," describes the use of the 15-ton fuel building bridge crane for the high-density spent fuel rack installation. Subsequent to the installation of these racks, the crane is used only to move light loads over stored spent fuel.

Administrative controls exist to prevent transport of heavy loads over stored spent fuel. USAR Section 9.1.2.3.2.2, "Fuel Building Fuel Storage," discusses the ability of the storage rack structure to withstand the impact resulting from a falling object possessing 3800 foot-pounds kinetic energy. The structural design of the racks is such that, under this impact force, no lateral displacement of fuel occurs; therefore, subcritical spacing is maintained. USAR Section 9.1.4.3, "Safety Evaluation, Fuel Handling System," discusses that, for the fuel building, the kinetic energy of any dropped object does not exceed that of a channeled fuel assembly, with the exception of new fuel when being transported by the fuel building bridge crane.

Entergy proposes to revise the TRM and USAR to allow a permanent exception for movement of the spent fuel pool gates (each of which represents a load greater than the current analyzed load) over fuel assemblies. In accordance with 10CFR50.59(c), Entergy is submitting an application for amendment of the license, pursuant to 10CFR50.90, to request NRC review and approval of the proposed change. Corresponding sections of the RBS USAR will be revised to be consistent with the exception and to state that the provisions of References 10.c through 10.f will be met. .

The Commission has provided standards for determining whether an amendment involves no significant hazards consideration, which are stated in 10CFR50.92(c). A proposed amendment to an operating license involves no significant hazards consideration if operation of the facility in accordance with the proposed amendment would not: (1) involve a significant increase in the probability or consequences of an accident previously evaluated; or (2) create the possibility of a new or different kind of accident from any accident previously evaluated; or (3) involve a significant reduction in a margin of safety.

Entergy has evaluated the proposed license amendment in accordance with 10CFR50.91(a), and provides here the analysis of the issue of no significant hazards consideration using the three standards in 10CFR50.92(c).

a. Involved a significant increase in the probability or consequences of an accident previously evaluated.

The RBS fuel building fuel storage facilities consist of three interconnected stainless steel-lined concrete pools. The spent fuel storage pool is the largest of these pools. Adjacent to the fuel storage pool are the cask pool and the lower IFTS pool. Each of these two pools is separated from the fuel storage pool by a full-height wall encompassing a watertight gate. The watertight gates are normally open, but are closed to seal their respective pools during cask handling and equipment maintenance operations. It is necessary to lift the gates from the pools for maintenance or seal replacement. The total weight of the gate including the rigging equipment is 2000 pounds. This lift is considered as a heavy load lift since it is higher than the current analyzed light load limit of 1200 pounds for movement of loads over fuel assemblies. TRM 3.9.14 prohibits any load in excess of 1200 pounds from travel over fuel assemblies in the storage pool.

Each of the gates is designed with a pneumatic seal that, when pressurized, seals the respective pool from the spent fuel pool, forming a watertight barrier. No provisions for moving the gates over fuel assemblies were included in the current licensing basis for RBS heavy loads. However, the service life qualification of the gate seals necessitates that they be replaced several times over the life of the plant. Therefore, approval of an exception to the current prohibition is required to allow for replacement of the gate seals.

To perform the movement of the gate from its installed position to a position where the seal can be replaced, an engineering plan that meets the intent of the applicable regulatory guidance has been developed. RBS' program for control of heavy load movements complies with that guidance, and this will prevent the gate from dropping onto the spent fuel assemblies during the movement activity. The program features include the design of the lifting devices, design of the cask and fuel bridge cranes, crane operator training, and the use of written procedures. The regulatory guidance will be met in all respects, except that, in lieu of a single failure-proof crane, the method will employ redundant and diverse means to meet the intent of single-failure proof movements.

Entergy proposes to lift the spent fuel pool gate using a rigging method that complies with the intent of the guidance of References 10.c through 10.f. The proposed method will be accomplished through the use of fuel building bridge crane and the cask crane at the same time to provide the redundancy required to make the lift single-failure proof and satisfy single-failure proof criteria.

In the proposed method, the fuel building bridge crane and the cask crane will be used to perform the gate lifting and movement. The intent of the applicable regulatory guidance is that in lieu of providing a single-failure-proof crane system, the

control of heavy loads guidelines can be satisfied by establishing that the potential for a heavy load drop is extremely small. The gate lifting using the bridge crane and cask crane will conform to applicable regulatory guidelines, in that the probability of the gate drop over the spent fuel assemblies is extremely small. Both cranes have a rated capacity of 15 tons. The maximum weight of the gate and rigging is 2000 pounds. Therefore, there is ample safety factor margin for lifting and movements of the subject spent fuel pool gate. Special lifting devices, which have redundancy or ultimate strength of at least ten times the lifted load, will also be utilized during the rigging process. Even though neither the fuel building bridge crane or the cask crane is a single-failure proof crane, rigging the spent fuel pool gate using both cranes will provide the required redundancy that meets the intent of single-failure proof criteria.

The proposed load lift of the fuel pool gate for replacement of the seal conforms to all of the applicable regulatory guidelines. The design of the lifting lugs and associated rigging (e.g., chains, slings, shackles, hoists, etc.) conforms to the guidelines of NUREG-0612, Section 5.1.6, and "Single-Failure Proof Handling System," and References 10.d through 10.f. The auxiliary hook of the cask crane has a rated capacity of 15 tons. The cask crane is not a single-failure-proof crane. However, it meets NUREG-0612 criteria of Section 5.1.1(6) and is designed for seismic loading. As discussed above, the cask crane, alone, will handle the gate only after the gate is located inside the cask pool where drop of the gate above the spent fuel rack is no longer a concern. The cask pool area has been evaluated for an accidental drop of the spent fuel cask. There is no safety-related equipment inside the cask pool. The analyzed maximum weight of the gate and rigging is 2500 pounds. Therefore, there is ample safety factor margin for lifting the gate with the cask crane.

The probability and consequences of a seismic event are not affected by the proposed gate lift. The consequences of a seismic event during the gate lifting are insignificant since both cranes, the fuel building bridge crane and the cask crane, are seismically qualified for the lifted load. In addition, the design of all rigging conforms to NUREG-0612 guidelines, with a safety factor of 10 for the weight of the load.

Consistent with the defense-in-depth approach outlined in the guidance, the movement will be conducted according to load handling instructions. Operator training will be conducted on the activity prior to the movement, and the equipment will be inspected before the movement will be performed. NUREG-0612 gives guidance that when a particular heavy load must be brought over spent fuel, alternative measures may be used. The combination of preventative measures, as proposed, minimizes the risks inherent in hauling large loads over spent fuel to permissible levels. Considering these provisions and the applicable regulatory guidance, the increase in probability of a load drop is negligible.

It is therefore concluded that the proposed gate lifting and movement does not involve a significant increase in the probability or consequences of an accident previously evaluated.

b. Create the possibility of a new or different kind of accident from any accident previously evaluated.

The lifting of the fuel pool gate in the spent fuel pool as described above minimizes the possibility of a heavy load drop onto spent fuel assemblies as not credible in accordance with single-failure-proof criteria. In addition, movement of the gate in the cask pool using the cask crane does not create the possibility of a new or different kind of accident. The cask drop accident scenario in the current RBS licensing basis (since the cask crane is not a single-failure-proof crane) envelops the accidental drop of the gate in the cask pool during handling by the cask crane. The analyzed weight of a cask is 125 tons, as compared to the 1 ton combined weight of the gate and the rigging.

It is therefore concluded that the proposed gate lifting does not create the possibility of a new or different kind of accident from any previously analyzed.

c. Invoke a significant reduction in a margin of safety.

By following the guidance of References 10.c through 10.f, the movement of the spent fuel pool gates will have no impact on the analyses of postulated design basis events for RBS. The NRC guidance provides an acceptable means of ensuring the appropriate level of safety and protection against load drop accidents. Therefore, there is no reduction in the margin of safety associated with postulated design basis events at RBS in allowing the proposed change to the RBS licensing basis. RBS will continue to meet its commitment to comply with the applicable guidance.

9. Environmental Evaluation

A review has determined that the proposed amendment would change a requirement with respect to installation or use of a facility component located within the restricted area, as defined in 10CFR20, or would change an inspection or surveillance requirement. However, the proposed amendment does not involve (i) a significant hazards consideration, (ii) a significant change in the types or significant increase in the amounts of any effluent that may be released offsite, or (iii) a significant increase in individual or cumulative occupational radiation exposure. Accordingly, the proposed amendment meets the eligibility criterion for categorical exclusion set forth in 10CFR51.22(c)(9). Therefore, pursuant to 10CFR51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the proposed amendment.

10. References

a. River Bend Station License Amendment Request 1999-31, "Heavy Load Exception to Allow Movement of Spent Fuel Pool Gates to Replace Gate Seal," dated December 16, 1999

b. Issuance of Amendment No. 108 to River Bend Station Operating License, dated January 13, 2000 (TAC No. MA7365)

c. NUREG-0612, "Control of Heavy Loads at Nuclear Power Plants"

d. NUREG-0554, "Single-Failure-Proof Cranes for Nuclear Power Plants"

e. Regulatory Issue Summary (RIS) 2005-25, "Clarification of NRC Guidelines for Control of Heavy Loads"

f. RIS-2005-25, Supplement 1, "Clarification of NRC Guidelines for Control of Heavy Loads"

g. NRC Bulletin 96-02, "Movement of Heavy Loads Over Spent Fuel, Over Fuel in the Reactor Core, or Over Safety-Related Equipment," issued April 11, 1996

Attachment 2

RBG-47382

Mark-up of Affected Pages

Technical Requirements Manual page TR 3.9-9
USAR Pages 9.1-12 and 9.1-22

Except for movement of spent fuel pool gates,

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, except for movement of spent fuel pool gates	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

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←•

, except for movement of spent fuel pool gates.

other than spent fuel pool gates

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.

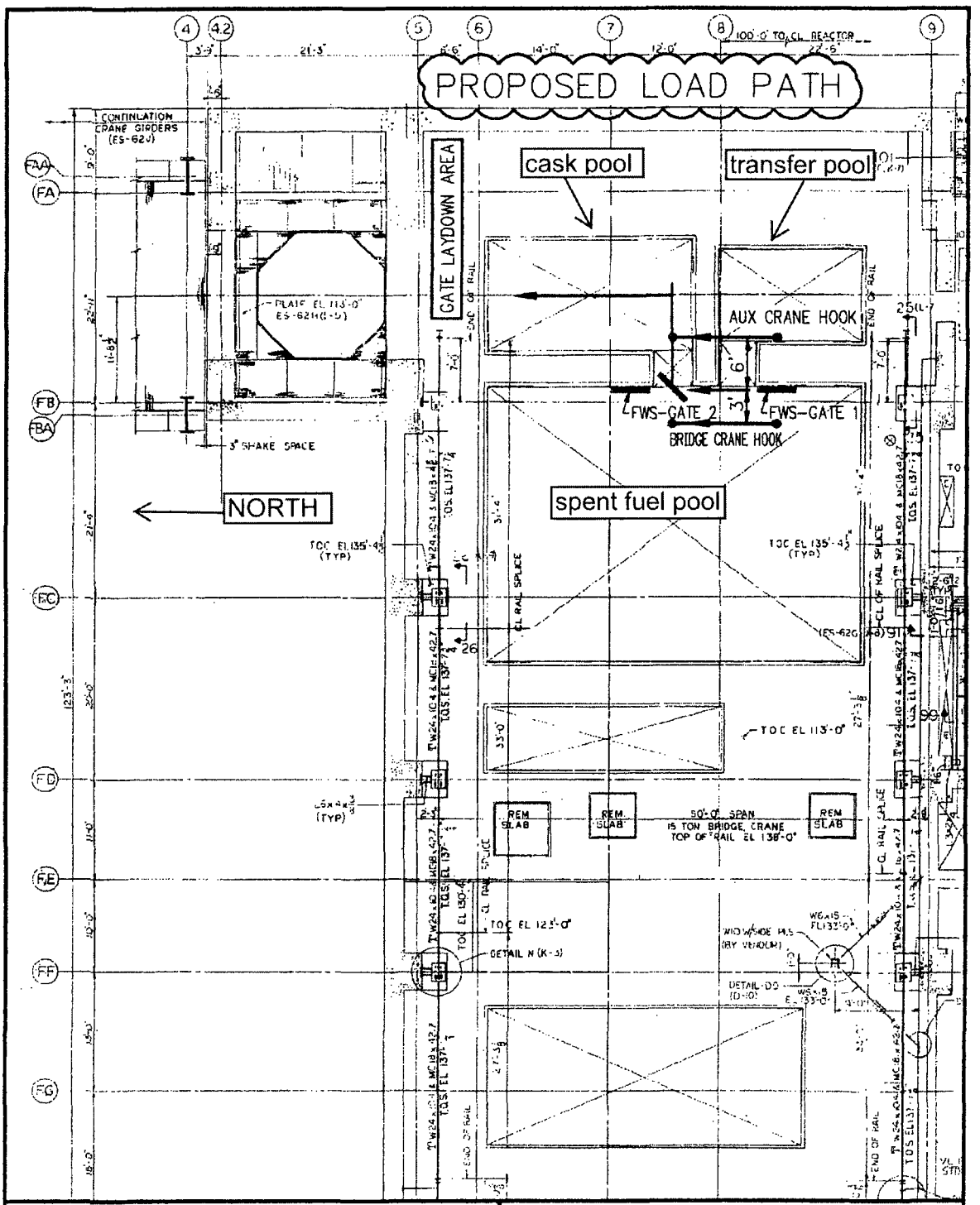
•←8

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.

Attachment 3

RBG-47382

Load Path Sketch



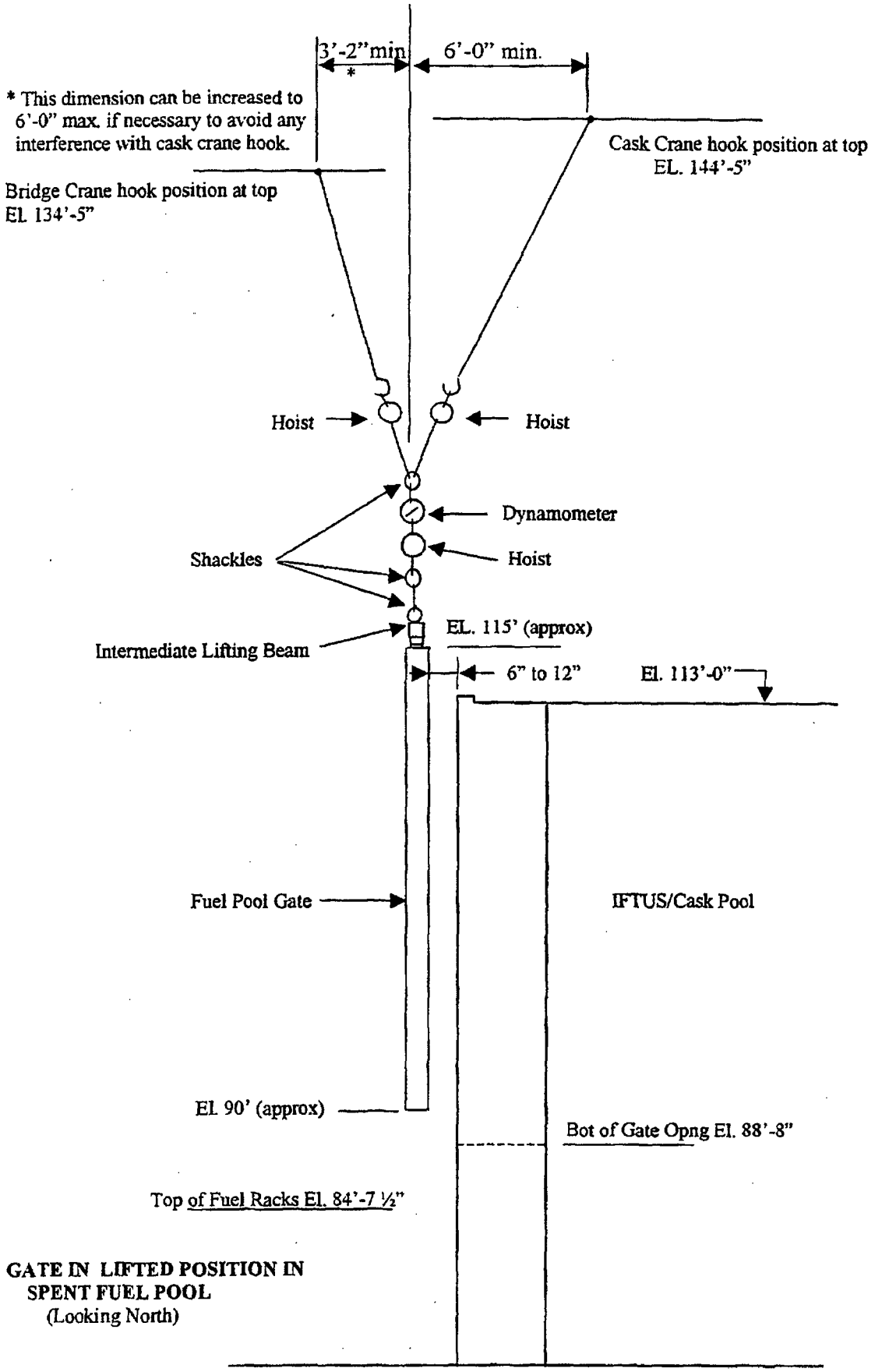
Entergy Operations, Inc.

DRAWING DETAIL
ES-062E (REV 6)

Attachment 4

RBG-47382

Rigging Sketch



GATE IN LIFTED POSITION IN SPENT FUEL POOL
(Looking North)

Attachment 5

RBG-47382

List of Commitments

This table identifies actions discussed in this letter that 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	
1. Work instructions for gate maintenance will include the proposed load lift rigging plan and the safe load path for movement.		X	Prior to any movement of the gates over fuel assemblies.
2. Crane operator training will be conducted prior to performing the move.		X	Prior to any movement of the gates over fuel assemblies.
3. Lifting and rigging equipment will be inspected prior to the movement.		X	Prior to any movement of the gates over fuel assemblies.
4. Corresponding sections of the RBS USAR will be revised to be consistent with the exception and to state that the provisions of References 10.c through 10.f will be met.		X	Prior to any movement of the gates over fuel assemblies.