August 16, 2001

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

SUBJECT: RIVER BEND STATION, UNIT 1 - ISSUANCE OF AMENDMENT RE: INCLINED FUEL TRANSFER SYSTEM OPERATION IN MODES 1, 2 AND 3 (TAC NO. MB1116)

Dear Mr. Edington:

The Commission has issued the enclosed Amendment No. 117 to Facility Operating License No. NPF-47 for the River Bend Station, Unit 1. The amendment consists of changes to the Technical Specifications (TSs) in response to your application dated January 24, 2001, as supplemented by letters dated July 18, and August 3, 2001.

The amendment proposes a change to TS 3.6.1.3, "Primary Containment Isolation Valves (PCIVs)," to allow operation of the inclined fuel transfer system (IFTS) bottom valve after removal of the IFTS primary containment isolation blind flange when primary containment operability is required in Modes 1, 2, and 3. The proposed change allows the full operation of the IFTS for a limited time while the plant is operating.

A copy of our related Safety Evaluation is enclosed. The Notice of Issuance will be included in the Commission's next biweekly *Federal Register* notice.

Sincerely,

/RA/

Robert E. Moody, Project Manager, Section 1
Project Directorate IV
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket No. 50-458

Enclosures: 1. Amendment No. 117 to NPF-47
2. Safety Evaluation

cc w/encls: See next page

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L.Hurley, RIV	D. Bujol, RIV	

*Provided Apr 6, 2001, letter is characterized as supp. to this application or AM.116 application
Accession No.: ML012200299 *No significant change from original SE input

OFFICE	PDIV-1/PM	PDIV-1/LA	IOLB/SC	SPLB/SC	SPSB/SC
NAME	RMoody	DJohnson	DTrimble*	GHubbard*	MReinhart*
DATE	08/10/01	08/10/01			

OFFICE	OGC/NLO with Comments*	PDIV-1/SC
NAME	RWeisman	RGramm
DATE	08/15/01	08/16/01

OFFICIAL RECORD COPY

ENTERGY GULF STATES, INC. **

AND

ENTERGY OPERATIONS, INC.

DOCKET NO. 50-458

RIVER BEND STATION, UNIT 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 117
License No. NPF-47

1. The Nuclear Regulatory Commission (the Commission) has found that:

   A. The application for amendment by Entergy Gulf States, Inc.* (the licensee) dated January 24, 2001, as supplemented by letters dated July 18 and August 3, 2001, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations set forth in 10 CFR Chapter I;

   B. The facility will operate in conformity with the application, as amended, the provisions of the Act, and the rules and regulations of the Commission;

   C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;

   D. The issuance of this license amendment will not be inimical to the common defense and security or to the health and safety of the public; and

---

* Entergy Operations, Inc. 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.

**Entergy Gulf States, Inc., has merged with a wholly owned subsidiary of Entergy Corporation. Entergy Gulf States, Inc. was the surviving company in the merger.

E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment; and Paragraph 2.C.(2) of Facility Operating License No. NPF-47 is hereby amended to read as follows:

(2) Technical Specifications and Environmental Protection Plan

The Technical Specifications contained in Appendix A, as revised through Amendment No. 117 and the Environmental Protection Plan contained in Appendix B, are hereby incorporated in the license. EOI shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.

3. The license amendment is effective as of its date of issuance and shall be implemented within 30 days from the date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

/RA/

Robert A. Gramm, Chief, Section 1
Project Directorate IV
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Attachment: Changes to the Technical Specifications

Date of Issuance: August 16, 2001

ATTACHMENT TO LICENSE AMENDMENT NO. 117

FACILITY OPERATING LICENSE NO. NPF-47

DOCKET NO. 50-458

Replace the following pages of the Appendix A Technical Specifications with the attached revised pages. The revised pages are identified by Amendment number and contain marginal lines indicating the areas of change.

Remove	Insert
3.6-16a	3.6-16a

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 117 TO FACILITY OPERATING LICENSE NO. NPF-47

ENTERGY OPERATIONS, INC.

RIVER BEND STATION, UNIT 1

DOCKET NO. 50-458

1.0 INTRODUCTION

By application dated January 24, 2001, (License Amendment Request (LAR) 2000-27), as supplemented by letters dated July 18 and August 3, 2001, Entergy Operations, Inc. (EOI or the licensee) requested changes to the Technical Specifications (TSs) for the River Bend Station, Unit 1 (RBS). The proposed changes would revise TS 3.6.1.3, "Primary Containment Isolation Valves (PCIVs)," to allow operation of the inclined fuel transfer system (IFTS) bottom valve after removal of the IFTS primary containment isolation blind flange when primary containment operability is required in Modes 1, 2, and 3. The proposed change allows full operation of the IFTS for a limited time while the plant is operating. The supplemental letters dated July 18 and August 3, 2001, provided additional information that did not expand the scope of the application as originally noticed, and did not change the Nuclear Regulatory Commission (NRC or the Commission) staff's proposed no significant hazards consideration determination as published in the *Federal Register* on March 21, 2001 (66 FR 15921).

2.0 BACKGROUND

By letter dated December 20, 1999, as supplemented by letters dated November 29, 2000, April 6, 2000 and May 7, 2001, EOI requested a change to RBS TS 3.6.1.3 to permit removal of the IFTS blind flange for a period of up to 60 days per fuel cycle during Modes 1, 2, or 3. This enabled limited testing and exercising of the IFTS prior to a refueling outage. In accordance with the request, the IFTS bottom gate valve was to remain closed during this period. By letter dated July 3, 2001, the NRC staff provided the results of its safety evaluation, and approved the request as license amendment 116.

By letter dated January 24, 2001, the licensee requested a further change that would allow operation of the IFTS bottom valve while the blind flange is removed during Modes 1, 2, or 3. This additional change is the subject of the present evaluation. Operation of the bottom valve would permit EOI to fully test and exercise the IFTS during power operations. EOI has indicated that, following an evaluation in accordance with 10 CFR 50.59, they intend to use this TS change to transfer new fuel into the containment prior to the start of refueling outages.

In the review of license amendment 116, the NRC staff considered the risk implications of blind flange removal and limited IFTS operation. This included an assessment of the impact of the change on: (1) suppression pool makeup capability, (2) containment isolation reliability,

(3) containment ultimate pressure capacity, and (4) containment integrity in beyond-design-basis seismic events. The NRC staff found the impact in each of these areas to be very small and consistent with guidance provided in Regulatory Guide 1.174, “An Approach for Using Probabilistic Risk Assessment in Risk-Informed Decisions on Plant-Specific Changes to the Licensing Basis,” and Regulatory Guide 1.177, “An Approach for Plant-Specific, Risk-Informed Decisionmaking: Technical Specifications.” The present license amendment request does not change any of the assumptions or licensee commitments associated with the prior review, with the exception of the IFTS bottom gate valve. The licensee previously committed to maintain the bottom gate valve closed when the blind flange is removed during Modes 1, 2, or 3, and is now requesting that the valve be permitted to be opened during this period. The NRC staff has assessed the impact of this change on containment isolation reliability and releases via the IFTS bottom valve, as described below. Previous NRC staff findings in all other areas remain valid, and are provided in the safety evaluation report for license amendment 116.

3.0 DETERMINISTIC EVALUATION

With the IFTS blind flange removed, two possible containment leak paths, namely the IFTS tube and the IFTS drain line, are created. The licensee proposed an alternate means to ensure the isolation function of the IFTS containment penetration. The alternate means includes the water seal in the IFTS tube maintained by the water level in the lower pool, the gate valve in the bottom of the IFTS transfer tube, and an isolated valve in the IFTS drain line. In the review of license amendment 116, the NRC staff evaluated the impact of blind flange removal, the alternative containment isolation, and limited IFTS operation. This included a deterministic evaluation of the containment isolation of the IFTS drain line, IFTS water seal, and IFTS bottom gate valve.

In their January 24, 2001, application, the licensee justified the IFTS water seal capability to withstand peak containment pressure of 7.6 psig resulting from a large break loss-of-coolant accident (LBLOCA). For a higher containment pressure resulting from a small break loss-of-coolant accident (SBLOCA) with large drywell bypass leakage, the water seal may be expelled from the IFTS tube if the bottom valve is opened. The containment design pressure is 15 psig, which is capable of handling the SBLOCA that was described in Updated Safety Analysis Report (USAR) Section 6.2.1.1.3.4. The licensee also excluded the SBLOCA from the consideration of the water seal. The NRC staff found the licensee’s position that a SBLOCA be excluded from consideration in the evaluation of a water seal to be unacceptable. As part of the containment, the IFTS penetration was reviewed with respect to General Design Criteria (GDC) 16, 50, and 54. The NRC staff believes that both LBLOCAs and SBLOCAs are design basis accidents (DBAs) for containment design such that the requirements in the GDC of Appendix A to 10 CFR Part 50 should be applied as appropriate.

Considering the limited-time operation, the NRC staff evaluated the proposed TS changes against Note 1 of NUREG-1434, "Standard Technical Specifications, General Electric Plants, BWR/6," Section 3.6.1.3. Note 1 provides that containment penetrations may be unisolated intermittently under administrative controls. Pursuant to 10 CFR 50.36, the limiting conditions for operation (LCO) in the TSs are the lowest functional capability of performance levels of equipment required for safe operation of the facility.

For the IFTS drain line, the first isolation valve is verified leak tight, via containment isolation valve leak testing. In addition, the licensee proposed to station a dedicated operator in the

vicinity of the IFTS drain line isolation valves to manually close the drain line isolation valve at the direction of the control room or upon a loss of offsite power (LOOP). Therefore, the isolation provision for the drain line satisfies the lowest functional capability for the LCO. This finding regarding drain line isolation remains valid regardless of the operation of the IFTS bottom gate valve.

For the IFTS tube, as long as the water seal remains in the IFTS, the isolation provision satisfies the lowest functional capability for the LCO. The licensee demonstrated that the water seal is able to withstand the containment pressure of 7.6 psig and can maintain the IFTS tube penetration isolated. At this pressure, the water seal is adequate for a design basis LBLOCA and a subset of SBLOCAs with drywell bypass leakage less than 10% of the design value. This finding remains valid regardless of the operation of the IFTS bottom valve.

If the drywell bypass leakage is higher than the 10% value, the water seal may not be sufficient to sustain the accident containment pressure (> 7.6 psig) resulting from such a SBLOCA. The licensee stated that any water leakage through the IFTS can be identified using the spent fuel level indications and associated level alarms in the control room. In the supplemental letter dated May 7, 2001, the licensee explained that the Alarm Response Procedures provide the operators with instructions to determine the cause of the level alarm and initiate corrective actions. Relying on the above operator action, the water seal could be maintained in the IFTS even if the containment pressure is higher than 7.6 psig. With the IFTS bottom valve open, the operator action will include closing the bottom valve.

The IFTS bottom valve (F42-MOV-F004) is a non-safety related, 24-inch hydraulically-operated gate valve. In the supplemental letter dated July 18, 2001, the licensee provided additional information regarding the operation of the bottom valve. If the bottom valve is open at the initiation of a loss-of-coolant accident (LOCA), the operators are instructed per EOP-0003 to isolate the bottom valve using the hydraulic actuator. If the fuel transfer carriage or cables are part way through the open valve, they would first be moved clear of the valve by a winch powered by a 480 VAC motor so that they would not block the valve in an open position. The IFTS system is controlled by two control panels, one in the fuel building and one in the containment. These control panels control normal manipulation of the winch and the bottom valve.

In a LOCA with offsite power available, the fuel transfer carriage and bottom valve could be operated from the control panel in the fuel building. RBS station power is fed by two independent 230 KV offsite power lines, RSS1 and RSS2. Currently, the power to the essential components for the IFTS system are split between RSS1 and RSS2. During a loss of one of the 230 KV lines, the remaining line can feed the required loads through the use of cross-tie breakers. Closure of the cross-tie breakers is performed manually using system operating procedures.

The licensee further committed, in its supplemental letter dated July 18, 2001, to establish contingency actions, within approved station procedures, to enable the manual closure of the IFTS bottom valve during a LOOP (without LOCA). These contingencies will include the actions necessary to manually operate the lower the IFTS upender and the IFTS winch in order to raise the IFTS carriage to a position above the bottom valve, if necessary, so the valve can be subsequently closed. Minor modifications to the IFTS bottom valve hydraulic system will also be made. Equipment and tools needed for the performance of these contingency actions,

including lighting sufficient to perform the tasks during LOOP conditions, will be staged in the area prior to operation of the IFTS bottom valve while in Modes 1, 2, or 3. Personnel needed to perform these contingencies will also be trained on the actions and associated procedures prior to operation of the IFTS bottom valve while in Modes 1, 2, or 3. Therefore, the isolation provision for the bottom valve satisfies the lowest functional capability for the LCO.

In a LOCA with coincident LOOP, the IFTS system could fail as is and the bottom valve could not be closed. The risks associated with this event with a limited-time operation (60 days) of flange removal will be discussed in the probabilistic risk analysis (PRA) in Section 4.0, below.

Based on the operator action to maintain the water seal; the contingency actions to close the bottom valve; the PRA in Section 4.0; the administrative controls applied to the bottom valve, as discussed above; and Note 1 of Section 3.6.1.3 of NUREG-1434, the NRC staff determined that the proposed operation of the bottom valve in the IFTS with the blind flange removed during power operation for 60 days during each operating cycle is acceptable.

4.0 PROBABILISTIC EVALUATION

The IFTS bottom valve (F42-MOV-F004) is a 24-inch hydraulically-operated gate valve. The bottom valve is non-safety related and powered from a hydraulic actuator power supply. The NRC staff considered the potential for over-pressure failure and excessive leakage of the IFTS bottom valve as part of its review of license amendment 116 and concluded that the probability of over-pressure failure would be negligible due to the high pressure capacity of the valve relative to the anticipated accident loads, and that excessive leakage would be unlikely as it would be readily detected as a result of significant differential pressures across the bottom valve when the flap valve and fill valves are opened during IFTS operation. These findings remain valid under the present request.

Also as part of the review of license amendment 116, the NRC staff considered the potential for flow through the IFTS bottom valve as a result of inadvertent operation of the valve, i.e., due to a spurious signal to open. The likelihood of inadvertent operation of the valve coincident with a severe reactor accident was judged to be very small, due in part to the commitment and administrative controls to maintain the bottom valve closed. Under the present request, the licensee will continue to maintain the bottom valve closed during periods when the system is not being operated. Based on anticipated IFTS operations described in the April 6, 2001, supplemental letter, with respect to license amendment 116 (which includes consideration of transferring new fuel into containment), the NRC staff estimates that the IFTS bottom valve will be closed about 51 days out of the 60-day period that the blind flange is removed during Modes 1, 2, or 3. The prior finding remains valid during those time periods. However, permitting the IFTS bottom valve to be opened for limited periods introduces a new failure mode; specifically, failure to close the bottom valve following onset of an accident. This failure mode would be relevant for the time period when the bottom gate valve is open. Based on the information provided in the April 6, 2001, supplemental letter, with respect to license amendment 116, the staff estimates that the bottom valve could be open about 9 days out of the 60-day period that the blind flange is removed during Modes 1, 2, or 3 (60 days minus 51 days). By supplemental letter dated July 18, 2001, the licensee provided additional information indicating the time duration for scheduled activities associated with opening the bottom valve is approximately 40 hours, or about 2 days. This includes time for operator training (about 6 hours), IFTS surveillance and post-modification testing (about 12 hours), and movement of new fuel into the

upper containment (about 24 hours). Thus, the bottom valve would likely be open much less than 9 days per fuel cycle.

Failure to close the bottom valve could occur as a result of human error, mechanical failure of the valve or valve hydraulic actuator, or failure of the hydraulic actuator power supply. The valve could also be prevented from closing if the fuel transfer carriage (or cables) is in a position that interferes with valve closure (e.g., within the spent fuel pool) and is unable to be withdrawn. Additionally, failure of power to other IFTS components not directly involved in the movement of the carriage or closure of the bottom valve could prevent manipulation of the carriage and bottom valve, since these power failures could cause a master position fault at the IFTS control panels. RBS power is fed by two independent 230 KV lines, RSS1 and RSS2. Approximately half of the station loads are supplied from RSS1 and the remaining loads are supplied from RSS2. Power to the essential components for the IFTS system is split between RSS1 and RSS2. Loss of either offsite power line will cause the loss of some or all of the IFTS function. Therefore, in a partial or full LOOP event, the IFTS system would likely fail as-is. The licensee estimates the frequency of core damage events involving partial or full LOOP to be about 7.7E-6 per year, or about 80% of the total core damage frequency (CDF) for RBS. Because of the dependence of both the fuel transfer carriage and the IFTS bottom valve on non-safety-related ac power and the relatively high contribution to CDF from LOOP events in boiling water reactors (BWRs), the dominant failure mode is expected to be failure to close due to LOOP.

In the event the bottom valve cannot be closed, the water seal will continue to maintain a leak-tight barrier to the release of fission products up to a containment pressure of about 9 psig. At containment pressures greater than 9 psig, which could develop in beyond-DBAs, the pressure inside the IFTS tube will exceed the hydrostatic pressure at the bottom valve outlet, and releases into the spent fuel storage pool will occur. Based on a review of the CDF contributors for several BWR Mark III plants, the NRC staff estimates that a substantial fraction of sequences, accounting for perhaps one-third of the CDF, would not lead to containment failure or bypass, but could result in containment pressures sufficient to clear the water seal.

If releases through the bottom valve in these sequences are conservatively assumed to constitute a large release, the incremental conditional large early release probability (ICLERP) can be estimated by assuming that the bottom valve fails to isolate in all loss of offsite power events. Under these assumptions, the ICLERP, for an exposure of 9 days within an 18-month fuel cycle, would be:

ICLERP = 7.7E-6 per year x 1/3 x 9/548 year = 4E-8

This is slightly below the ICLERP guideline value of 5E-8 provided in Regulatory Guide 1.177 for confirming that a proposed permanent TS change has only a small quantitative impact on plant risk. If the exposure time (the time the bottom valve is actually open during the fuel cycle) is based on the licensee's revised estimate of 40 hours rather than 9 days, the estimated ICLERP would be about 8E-9, or a factor of 6 below the guideline value.

It is important to note that releases via the IFTS bottom valve would not be considered large releases according to existing regulatory guidance, and that the risk would in fact be lower than indicated by this comparison. Furthermore, the licensee has committed to establish contingency actions to enable manual closure of the IFTS bottom valve during a loss of offsite

power, further reducing risk and enhancing defense-in-depth. Each of these factors are discussed below.

4.1 Scrubbing of Releases From the Bottom Valve

Regulatory Guide 1.174 defines large early release frequency (LERF) as the frequency of those accidents leading to significant, unmitigated releases from containment in a time frame prior to effective evacuation of the close-in population such that there is a potential for early health effects. Such accidents generally include unscrubbed releases associated with early containment failure at or shortly after vessel breach, containment bypass events, and loss of containment isolation. Scrubbed releases are generally not considered to contribute to LERF since fission product removal by deep water pools is sufficient to virtually eliminate the potential for early health effects.

Releases through the IFTS bottom gate valve will be scrubbed by at least one water pool before entering the environment. Scrubbing would first occur within the suppression pool inside containment prior to the fission products reaching the upper containment in those sequences or portions of sequences in which the fission products pass through the suppression pool. This includes the in-vessel phase of transient events, during which the fission products are released directly into the suppression pool via the safety relief valves, and the late (ex-vessel) phase of a severe accident, during which the fission products pass from the drywell to the wetwell via the suppression pool. The existence of drywell leakage, even within the limits permitted by TSs, could result in a portion of the fission products bypassing the suppression pool during the in-vessel phase of LOCAs and the ex-vessel phase of all accidents. According to the licensee, in their supplemental letter dated November 29, 2000, the “as-found” drywell leakage at RBS has historically been well below the maximum value permitted by TSs and, as such, substantial suppression pool bypass will not occur. The NRC staff acknowledges that suppression pool scrubbing is likely in IFTS release scenarios, but not assured for all phases of all accidents if the plant is operating with a drywell leakage near the limits permitted by TSs.

Regardless of suppression pool scrubbing, all releases passing through the IFTS bottom valve will then be scrubbed by approximately 21 feet of overlying water in the spent fuel storage pool. Accordingly, while the above ICLERP estimates provide a bounding assessment for comparison to regulatory guidance, releases via the IFTS bottom valve would not be considered large releases based on the guidance in Regulatory Guide 1.174 and supporting documents, such as NUREG/CR-6595, “An Approach for Estimating the Frequencies of Various Containment Failure Modes and Bypass Events.”

In addition, with the IFTS flap and fill valves closed, as required by system interlocks whenever the IFTS bottom valve is open, the IFTS sheave box and transfer tube communicate with the upper containment atmosphere via a 4-inch sheave box vent line that terminates above the surface of the upper pool. Although not sufficiently restrictive to completely eliminate the potential for early health effects, the size of the flow path would further reduce the severity of the release.

4.2 Contingency Actions to Manually Close the IFTS Bottom Valve

By supplemental letter dated July 18, 2001, the licensee committed to establish contingency actions, within approved RBS procedures, to enable the manual closure of the IFTS bottom

valve during a loss of offsite power. These contingencies will include the actions necessary to manually operate the lower IFTS upender and IFTS winch in order to raise the IFTS carriage to a position above the bottom valve, if necessary, so the valve can be subsequently closed. Minor modifications to the IFTS bottom valve hydraulic system will also be made. Equipment and tools needed for the performance of these contingency actions, including lighting sufficient to perform the tasks during loss of offsite power conditions, will be provided in the area prior to operation of the IFTS bottom valve while in Modes 1, 2, or 3. Personnel needed to perform these contingencies will also be trained on the actions and associated procedures prior to operation of the IFTS bottom valve while in Modes 1, 2, or 3.

The staff considers that these contingency actions, together with the fission product scrubbing provided by the suppression pool and the spent fuel pool, provide sufficient defense-in-depth against large releases to the environment.

5.0 POST-ACCIDENT DOSE EVALUATION

The removal of the IFTS blind flange alters the containment boundary for the IFTS penetration and causes the potential for two additional leakage pathways allowing release of the post-accident containment atmosphere to the environment. The larger pathway is the IFTS transfer tube itself, and the other is a branch line used for draining the IFTS transfer tube during its operation. The drain line will be isolated if necessary via administrative controls on the first drain piping isolation valve to prevent any potential radioactivity release. This drain piping isolation valve will be added to the Primary Containment Leakage Rate Testing Program to ensure that leakage past this valve will be maintained consistent with the accident analysis assumptions. The licensee has performed evaluations that have determined that, in the event of a postulated design basis LBLOCA, (1) the IFTS piping can withstand the projected peak containment pressure, and (2) the water seal created by the water depth in the lower IFTS transfer pool is more than sufficient to withstand the containment pressure due to the LBLOCA. Because of the water seal formed by the lower pool, the containment atmosphere is not able to escape through the IFTS transfer tube, through the lower pool water, into the fuel building atmosphere, and eventually into the outside environment. The lower pool water seal, along with administrative controls on the drain piping isolation valve, maintain containment integrity and no new radioactivity release pathways are expected in the event of a design basis LBLOCA with the IFTS blind flange removed.

The staff finds that, from the above information, specifically since no new release pathways are postulated for a LBLOCA with the IFTS blind flange removed, removal of the IFTS blind flange has no impact on the design basis LOCA dose analysis assumptions or results. The staff finds that the current USAR Chapter 15.6.5 LOCA dose analysis remains bounding for the proposed TS changes.

6.0 HUMAN FACTORS

6.1 Scope of Evaluation

This review is limited to the supplemental letter dated August 3, 2001, and specifically to the IFTS operator tasks required to enable closure of the IFTS bottom valve, including the repositioning of the upender, and manual operation of the IFTS winch, under expected reduced

lighting conditions in the event of a LOOP. These manual operator actions are necessary to close the IFTS bottom valve in the event of a LOOP.

The staff's guidance for this review includes Information Notice 97-78, "Crediting of Operator Actions In Place of Automatic Actions and Modifications of Operator Actions, Including Response Times."

6.2 Human Factors Evaluation

In its supplemental letter dated August 3, 2001, EOI provided additional information and commitments to address the questions that the staff had posed in its request for additional information regarding manual operator actions during LOOP. EOI stated that if the process of manually closing the IFTS bottom valve during a LOOP was necessary and the carriage was located in the lower pool and upended to the vertical position, then the manual operator actions for closing the IFTS bottom valve would include:

- The manual repositioning of the lower upender to the inclined position
- The manual operation of the IFTS winch to raise the carriage above the bottom valve
- The manual closure of the IFTS bottom valve

The staff reviewed the following issues related to the above three proposed manual operator actions:

6.2.1 Demonstrations/Walk-throughs

For the manual repositioning of the upender and subsequent manual closure of the IFTS bottom valve, EOI will demonstrate, using a mock-up in a training facility or other suitable location, that operators can adequately perform the required manipulations, using portable lighting only. No credit for the existing emergency lights installed in the vicinity of the IFTS equipment in the Fuel Building will be taken during the demonstration. This demonstration will include valve manipulations, connection of fittings/hoses, and the set-up of a manual pump in an area with no lighting other than the portable lighting that will be staged in the plant. Two operators, who normally work as the IFTS Operator and Fuel Handling Bridge Operator, will perform the demonstration using draft procedures. The mock-up will demonstrate the operator actions needed to set up for manual operation of the bottom valve and upender, but, the demonstrations will not include the actual operation of an IFTS bottom valve or upender. These mock-up demonstrations will be performed a minimum of three times using different operators.

For manual operation of the IFTS winch, EOI will demonstrate, using a winch mock-up in a training facility or other suitable location, that operators can adequately perform the necessary manipulations, using portable lighting only. No credit for the existing emergency lights installed in the vicinity of the IFTS winch inside the Containment will be taken during the simulation. Two operators, who normally work as the IFTS Operator and Refueling Bridge Operator, will perform the demonstrations using draft procedures. The mock-up will demonstrate the removal of access covers, installation of a strong-back on the winch drum brake, installation of the winch motor hand-wheel, and release of the motor brake in an area with no lighting other than the portable lighting that will be staged in the plant. EOI will use an actual winch cover in the mock-up demonstration. Winch operation to raise the carriage will be simulated only. These mock-up demonstrations will be performed at least three times using different operators.

The commitments to perform demonstrations using mock-ups to simulate set up of equipment and operation of the IFTS upender, bottom valve and winch as described above, are sufficient to show that these actions can be accomplished as described, and are acceptable to the staff.

6.2.2 Staffing

In order to perform the above manual actions, all of the IFTS operators performing the task of moving fuel will be available. It is expected that eight operators will be available, and therefore, the staff finds that lack of staffing should not be a deterrent to the performance of the tasks. This is acceptable to the staff.

6.2.3 Communications

Communications during the mock-up demonstrations will also be simulated. During actual operation of the IFTS in Modes 1, 2, or 3, EOI will utilize the wireless communication equipment that is normally utilized for refueling activities with belt pack and optional toggle or open handheld microphone. This communication capability commitment is acceptable to the staff.

6.2.4 Emergency Lighting Levels

Since the postulated event is a LOOP, sufficient emergency lighting is a necessity. Emergency lighting in the IFTS areas of the Fuel Building and Containment is installed to provide a means of egress and exit from those areas. RBS's USAR, Table 9.5-2 shows that 0.5 foot-candles is required for this purpose.

In the Fuel Building's 113 ft. elevation are three emergency light fixtures, positioned on the north, east, and south walls around the pools. EOI will stage the portable lighting and equipment required for the contingency actions within the area illuminated by the emergency lighting on the east wall of the Fuel Building, which is nearest to the IFTS control panel. Staging of this equipment will be completed prior to opening the IFTS bottom valve with the IFTS blind flange removed in Modes 1, 2, or 3. EOI considers the existing emergency lighting to be adequate to enable the IFTS operators to retrieve and utilize the portable lighting that will be staged for their use in performing these contingency actions.

In the Containment, an emergency light fixture is currently installed on the wall above the IFTS control panel. As in the Fuel Building, the portable lighting and equipment required for performing the contingency actions will be staged in the area illuminated by this emergency lighting fixture.

With respect to portable lighting that will be staged for use in the bottom valve closure contingency, EOI will test that portable lighting to ensure that it is functional, prior to beginning IFTS operation each day that the IFTS bottom valve will be opened. EOI will also ensure that fresh, spare batteries are staged with the portable lighting.

The commitments for portable lighting staged in appropriate locations, in addition to emergency light fixtures as described above, are sufficient to show that provisions have been made for adequate lighting, and are acceptable to the staff.

6.2.5 Operator Training and Modification Testing

Following installation of the described modifications in the plant, post-modification testing will be performed to demonstrate that a manual pumping device connected to the IFTS hydraulic lines will reposition the upender and close the bottom valve as necessary. IFTS operators will perform walk-throughs of the contingency actions, using approved procedures, as part of their training. The staff finds that the commitments and the ability of the operators to accomplish the task are sufficient to allow the task to be performed, and acceptable to the staff.

6.2.6 Procedures

Information obtained during the performance of post-modification testing will be incorporated into procedures to ensure that adequate criteria are provided to the IFTS Operators for determining the position of each piece of equipment. The staff finds that the commitments related to procedures and the above discussion provide assurance that procedures to be used by the IFTS operations to perform the three tasks will be acceptable to the staff.

7.0 DETERMINISTIC/PROBABILISTIC EVALUATION CONCLUSION

The NRC staff considered the risk implications of blind flange removal and limited IFTS operation in the prior review of license amendment 116. This included an assessment of the impact of the change on: (1) suppression pool makeup capability, (2) containment isolation reliability, (3) containment ultimate pressure capacity, and (4) containment integrity in beyond-design-basis seismic events. The NRC staff found the impact in each of these areas to be very small and consistent with guidance provided in Regulatory Guide 1.174 and 1.177.

The staff finds that use of manual actions by the IFTS operators, as backup in case of an emergency, to manually close the bottom isolation valve at the direction of the control room or upon LOOP, is an acceptable contingency alternative for isolating the containment while the blind flange is removed when the plant is in Modes 1, 2, or 3. This conclusion is based on the commitments to provide special equipment and portable upgraded emergency lighting near the location of the manual tasks, specialized training for IFTS operators, and revised procedures.

The licensee previously committed to maintain the IFTS bottom gate valve closed when the blind flange is removed during Modes 1, 2, or 3, and is now requesting that the valve be permitted to be opened during this period. The NRC staff has assessed the impact of this change on containment isolation reliability and releases. If releases through the bottom valve are conservatively assumed to constitute a large release, the ICLERP is estimated to be below the guideline value of 5E-8 provided in Regulatory Guide 1.177 for confirming that a proposed permanent TS change has only a small quantitative impact on plant risk. Releases through the IFTS bottom gate valve will be scrubbed by at least one water pool before entering the environment and, as such, would not be considered large releases based on the guidance in Regulatory Guide 1.174 and supporting documents. Finally, the licensee has committed to establish contingency actions to enable the manual closure of the IFTS bottom valve during a LOOP. Thus, the risk associated with the license amendment request would in fact be much lower than indicated by the above comparisons.

In summary, the deterministic evaluation of this license amendment request considered the provisions of the Standard Technical Specifications to unisolate containment penetrations

intermittently under administrative controls, the limited time that the blind flange would be removed during power operation, other alternate means to isolate the IFTS tube, and contingency actions to close the bottom valve. The probabilistic evaluation considered the scrubbing of releases through the bottom valve, potential bottom valve failure modes, and also contingency actions to close the bottom valve. An evaluation of the off-site post-accident radiation doses and human factors associated with the contingency actions to close the bottom valve was performed. When considered collectively, the above evaluations show that the licensee's proposed actions will provide reasonable assurance that the removal of the IFTS blind flange at power with the bottom valve open for a limited time is acceptable. Therefore, the proposed changes to the TSs are acceptable.

8.0 STATE CONSULTATION

In accordance with the Commission's regulations, the Louisiana State Official was notified of the proposed issuance of the amendment. The State official had no comments.

9.0 ENVIRONMENTAL CONSIDERATION

The amendment changes a requirement with respect to installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20 and changes surveillance requirements. The NRC staff has determined that the amendment involves no significant increase in the amounts, and no significant change in the types, of any effluents that may be released offsite, and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously issued a proposed finding that the amendment involves no significant hazards consideration, and there has been no public comment on such finding (66 FR 15921, March 21, 2001). Accordingly, the amendment meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the issuance of the amendment.

10.0 CONCLUSION

The Commission has concluded, based on the considerations discussed above, that (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

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