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NUCLEAR REGULATORY COMMISSION

REGION IV

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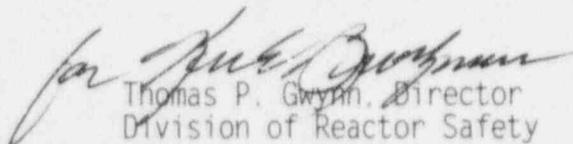
JUL - 6 1996

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SUBJECT: NRC INSPECTION REPORT 50-458/96-01

Thank you for your letter of June 17, 1996, in response to our letter and Notice of Violation dated April 18, 1996. We have reviewed your reply and find it responsive to the concerns raised in our Notice of Violation. We will review the implementation of your corrective actions during a future inspection to determine that full compliance has been achieved and will be maintained.

Sincerely,

  
Thomas P. Gwyn, Director  
Division of Reactor Safety

Docket No.: 50-458  
License No.: NPF-47

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E-Mail report to D. Nelson (DJN)  
E-Mail report to NRR Event Tracking System (IPAS)  
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Project Engineer (DRP/D)  
Branch Chief (DRP/TSS)  
Resident Inspector  
DRS AI 96-G-000045

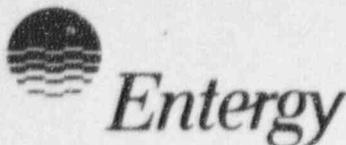
Senior Resident Inspector (Grand Gulf)  
Senior Resident Inspector (Cooper)  
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JAN 24 1996

June 17, 1996

U.S. Nuclear Regulatory Commission  
Attn: Document Control Desk  
Mail Stop P1-37  
Washington, D.C. 20555

Subject: Reply to Notice of Violation IR 96-01  
River Bend Station - Unit 1/Docket No. 50-458

File No.: G9.5, G15.4.1

RBF1-96-0230  
RBG-42988

Ladies and Gentlemen:

Pursuant 10CFR2.201, please find the Entergy Operations Inc., response to the notice of violation described in NRC Inspection Report (IR) 96-01. This response is being submitted after the original request date as approved by Mr. Phil Harrell of your office.

We have carefully evaluated each of the identified violations and have initiated appropriate actions as discussed in the enclosed response. In addition to a comprehensive evaluation of the specific examples identified in your report, we examined our overall performance related to fuel protection during refueling operations. Extensive resources have been concentrated on the evaluation of this area including, in part, a broad based self-assessment of refueling activities and an independent assessment of human performance issues. The results of these assessments, along with our improvement initiatives, will be discussed at the upcoming management meeting currently scheduled for August 19, 1996.

This was the first post-merger refueling outage at River Bend Station (RBS) in which EOI had the benefit of an entire cycle for outage preparation. Performance improvements were implemented during this period, but additional improvement is necessary to achieve the EOI standards of operational excellence. With a self-critical approach and focus on attention-to-detail, our plant, people and processes, will continue to improve while maintaining the expected level of safe refueling operations. We look forward to sharing our lessons learned and assessment results with you at our upcoming meeting.

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Reply to Notice of Violation IR 96-01

June 17, 1996

RBF1-96-0230

RBG-42988

Page 2 of 2

Should you have any questions, please contact Mr. D. N. Lorfing at (504) 381-4157.

Sincerely,



RJK/RMM/kvm  
attachments

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## Executive Summary

The results of our root cause investigations of these specific violation issues are detailed in the following attachments. In addition to evaluating the specific violations, we have expanded our evaluation to include an assessment of our overall performance during refueling outage six. This is based, in part, on two key assessments. A broad based EOI self-assessment and an independent assessment conducted by an industry expert to evaluate human performance issues identified during our recent refueling outage. The evaluation of these assessment results are ongoing. These assessments are providing an in-depth evaluation of our overall performance weaknesses and will provide enhancements to our refueling operation initiatives. We expect to discuss additional details of these assessments and summarize our lessons learned and improvement plan at the August 19, 1996, management conference.

In addition to the violations, several concerns and weaknesses were identified in the inspection report. In particular, the report stated the NRC's concern with the fuel bundle loading error, which was further heightened by the instances of mishandling in the spent fuel pool. Fuel protection is of the utmost importance and we have initiated efforts to ensure the highest level of safety is maintained during refueling operations. For the issues noted, corrective actions were implemented to resolve the immediate issues and continue safe refueling activities. Long term actions focused on preventing recurrences are also discussed in the attached response. The assessments discussed above are expected to validate our current corrective actions and provide insight for additional initiatives, if necessary.

In the report a concern was noted regarding implementation of design basis requirements for our pneumatic fuel pool gate seals. As you observed during the inspection, an engineering team was established to ensure this issue was appropriately addressed. We understand the significance of these systems for the overall protection of personnel during refueling activities and will ensure the appropriate corrective actions are fully implemented prior to the next refueling outage. Details of our evaluation concerning this issue are presented in the attached violation response. As noted in the report, there were several missed opportunities to identify and resolve some of these issues. We agree with your observation. During past assessments, performed during development of the RBS Long Term Performance Improvement Plan (LTPIP), we identified deficiencies with several of the processes discussed in your report. The key processes targeted for improvement were, in part, the corrective action program and the design change process.

As a result of these past LTPIP assessments, several of the processes were improved. Reviews subsequent to the inspection concluded that these process improvements, had they been in effect at the time the issues arose, would have prevented or mitigated these occurrences. These improvements included changes to the Condition Report (CR) program to require tracking of action items from cradle to grave. The Engineering Evaluation Assistance Request program, in effect up to 1995, has been disbanded and replaced with a more effective program. In addition, the ongoing Preventive Maintenance Upgrade Program, development of

a comprehensive Component Database, implementation of an Electronic Maintenance System, implementation of Maintenance Rule requirements, and a Drawing Upgrade Project, including other initiatives being implemented in accordance with the RBS LTPIP, will prevent recurrence of similar design issues.

In addition to these process changes, a design basis document upgrade program is underway to improve current system design requirement documents for 23 of our more risk significant systems. This initiative will include a comprehensive review of design and licensing bases documentation to ensure consistent translation of design information into plant design documents. This effort includes, in part, an Updated Safety Analysis Report (USAR) conformance review for the 23 corresponding systems to ensure that applicable design basis information is accurately and consistently reflected in the USAR.

During our recent refueling outage, cleaning of the suppression pool identified items in the pool that had not been reported as required by site administrative procedures. In the report, a violation was cited regarding the reluctance of personnel to identify items dropped into the suppression pool. We understand the safety significance of maintaining cleanliness of the suppression pool and have taken immediate corrective actions to ensure that debris entering the pool is minimized and documented. Details of these corrective actions are discussed in the attached response to the violation. We believe that these intermediate actions will provide adequate control to maintain safe operation of suppression pool safety systems until ongoing long term actions are completed. Long term initiatives include installation of a permanent filtration system which will assist in the identification of items entering the pool and allow for their removal during the cycle. The filtration system is expected to be completed during refueling outage 7, currently scheduled for September 1997.

You also noted workers did not promptly bring potential safety issues to management's attention. At RBS, the Corrective Action Program is the primary program used to identify and document resolution of conditions adverse to quality. EOI is aware of the significance of this program and believes this program is invaluable in maintaining a safety-minded culture. Management expectations concerning the importance of this program have been conveyed to site personnel and are continuously reinforced. To ensure these expectations are being met, periodic surveys based on personnel interviews are conducted. These survey results have indicated there are specific areas where issues are not being consistently identified. In the past, where these areas have been identified, expectations were re-emphasized resulting in increased problem identification. These surveys will continue to be performed and the appropriate actions taken. To re-emphasize management expectations, the site vice president is distributing a memorandum to site personnel discussing the importance of identifying adverse conditions to management. In addition, these expectations are being reinforced to site supervisors.

During the NRC's inspection, a lack of direct management oversight of fuel handling activities on the refueling bridges was mentioned. Our recent self-assessment evaluated this function and preliminary results indicate that additional oversight would have been beneficial in certain areas. In addition, we recently added a Refuel Floor Coordinator to the outage management

team which is expected to provide additional management focus for refuel floor activities. This is a management level position currently being filled with an individual possessing a significant level of RBS experience. We are continuing to evaluate the results of our self-assessment and expect to provide additional details at the upcoming meeting.

The root cause evaluations and corrective actions for the specific violation examples are contained in the following attachments.

## ATTACHMENT A

### REPLY TO NOTICE OF VIOLATION 50-458/9601-01

#### Violation

Technical Specification 5.4.1 states, in part, "Written procedures shall be established, implemented, and maintained covering the following activities: a. The applicable procedures recommended in Regulatory Guide 1.33, Revision 2, Appendix A, February 1978." Appendix A of Regulatory Guide 1.33 lists activities that should be covered by written procedures, including, "Preparation for refueling and refueling equipment operation," and "Refueling and Core Operations."

"Procedure ME01597, 'Refueling Platform,' Revision 8, Step 9.4.9.14, required checking the refueling bridge zone computer interlocks in accordance with Vendor Technical Manual 3224.110-000-016A. 'Refueling Platform, GEK-83294.' Step 3.19.16 of the technical manual contained detailed requirements for verifying the zone computer interlocks."

"Procedure ADM-0081, 'Cleanliness Control,' Revision 3, was established to implement foreign material exclusion for all plant conditions, including refueling. Step 8.3 of the procedure required maintaining accountability and document tools and items entering and leaving a foreign material exclusion area, as well as, having devices to secure items from inadvertently falling into a foreign material exclusion area. In addition, Step 8.4.3 of the procedure required initiation of a condition report when material was lost introduced into an open system or component and not immediately retrieved."

Contrary to the above, the inspectors identified that:

- (a) "The checking of refueling bridge zone computer interlocks on January 2, 1996, was not done in accordance with the requirements of Step 3.19.16 of the vendor technical manual but, instead, with a zone computer map and the skill of a test technician."
- (b) "Between January 8 and February 2, 1996, there were numerous instances where Step 8.3 of Procedure ADM-0081 was not followed, and items brought into the fuel and reactor building pool areas were not accounted for, documented, and secured."
- (c) "Personnel failed to follow Step 8.4.3 of Procedure ADM-0081 and initiate condition reports for numerous 'items lost in the suppression pool since the last refueling outage (RF-5)."

## REPLY TO NOTICE OF VIOLATION 50-458/9601-01(a)

### Reasons for the Violation

Entergy Operations, Inc. (EOI) has determined that personnel not following expected standards during revision of a preventive maintenance (PM) task is the root cause of this condition. This condition was a result of management standards and expectations not being met.

An upgrade initiative to improve the overall quality of the River Bend Station (RBS) PM tasks was included in the RBS Long Term Performance Improvement Plan. PM task ME01597, 'Refueling Platform,' was processed through this upgrade program; however, personnel responsible for the revision did not conform to program requirements or management expectations. These program requirements and expectations are, where applicable, to avoid branching to separate documents for additional work instructions. In this case, reference was made to a General Electric (GE) vendor manual without referencing the specific steps or sections to be followed. The personnel involved processed maintenance task ME01597 without fully meeting the expected requirements.

The GE vendor technical manual describes a detailed coordinate verification method and provides a permissive zone map to check the refueling platform zone computer interlocks. The map references the position of the refueling platform and movements to verify the computer interlocks. Past checks of the refueling platform zone computer interlocks have been accomplished by GE technicians or contractors with GE experience. Apparently, the GE practice used only the zone map for guidance, relying on the technician's experience to perform the test. This test method placed the refueling platform in the appropriate location and attempted to move the refueling platform mast toward the walls to verify that it stopped before contact was made. Because the PM tasks did not reference the specific vendor manual sections/steps, the GE technician did not question the adequacy of his test method and signed the test step completed.

At various times during PM task performance, the responsible EOI system engineer discussed work progress with the GE technician. During these conversations the technician described the method utilized to test the zones and indicated the zone map was used to perform the test. Based on the experience level of the technician and the adequacy of the testing performed, the system engineer did not question the specific procedure requirement containing the general reference to the vendor manual (i.e. task referenced the manual rather than a specific section of the manual). Subsequent to these conversations and a review of the completed work package, the system engineer approved the work package.

### Corrective Steps That Have Been Taken and the Results Achieved

After identification of this issue, the system engineer discussed the issue with the GE technician to determine which steps were actually performed. A review of these steps

concluded the test was adequate to functionally test the computer zone permissive interlocks. The results of this discussion were provided to NRC inspectors during the inspection.

A review of the PM Work Instruction Writer's Guide was performed to ensure that the guidance was clear. This review did not identify any deficiencies. In addition, the writer's guide was revised to add a review of revised PM tasks to ensure that references to work instructions, other than the task itself, meet the expected standards.

The issue concerning the less than adequate PM task revision was discussed with the personnel involved. During this discussion, management expectations and the requirements of the PM upgrade program were emphasized. In addition, the standards and expectations delineated in PM Work Instruction Writer's Guide were re-emphasized to PM task writers.

The primary individual involved with this issue has been reassigned to other responsibilities.

#### **Corrective Steps That Will Be Taken to Avoid Further Violations**

A sample review of upgraded PM tasks is being performed to identify similar occurrences or instances where current standards may not be met. Additional reviews may be considered based on the results of the review.

A review of the actual zone permissive functional checks is being performed to evaluate the feasibility of transferring responsibility for testing to the RBS operations department. Subsequently, PM task procedure ME01597 will be revised to clarify the reference and any other changes needed.

#### **Date When Full Compliance Will Be Achieved**

Full compliance was ensured based upon review of the adequacy of the zone computer functional testing performed during refueling outage six. As discussed above, additional corrective actions are being implemented to prevent similar recurrences and are expected to be completed prior to refueling outage seven, currently scheduled for September 1997.

## REPLY TO A NOTICE OF VIOLATION 50-458/9601-01(b & c)

### Reasons for the Violation

A self-assessment of the RBS Foreign Material Exclusion (FME) program was performed from January 8 through 11, 1996. The results from that assessment, along with an additional investigation, determined the root cause of this violation to be a less than adequate FME procedure in that it was difficult to understand and implement. In addition, training on proper FME controls was less than adequate. Additional information is discussed below.

### Violation Example 9601-01(b)

The areas around the fuel pools are designated as Zone III housekeeping areas. Current procedures specify Zones I through V with Zone I being the most stringent. Zone III areas require a log be maintained to account for both personnel and material entering the zone and to limit use of any unnecessary material. As identified during refueling outage six, there were several instances where these controls were not followed.

Reviews of entry logs identified discrepancies where materials were not properly logged (i.e. listed "pencils" as opposed to "10 pencils"). In addition, several instances were identified where unsecured materials were found around the pools. Corrective actions have been implemented in the past to improve FME controls; however, as concluded in the FME self-assessment mentioned above, they have not been totally effective. Past improvements were noted subsequent to previous corrective actions but the expected results have not been achieved.

### Violation Example 9601-01(c)

In addition to the root cause identified above, there were additional contributing factors. They are:

- The open design of the suppression pool.
- Items dropped into the pool may not be reported because 1) the lack of water clarity makes it difficult to identify dropped items or to determine the responsible person, 2) individuals are reluctant to report themselves as they are concerned about performance accountability and consequences, 3) the condition report process is inconvenient to use to report dropped items while inside containment, and 4) personnel were not aware that items had dropped into the pool.

Debris can enter the suppression pool due to the open style design of the RBS suppression pool (GE Mark III containment type) which is easily accessible both during operation and outages. In consideration of this design, RBS housekeeping and FME requirements include administrative restrictions which are intended to control materials in sensitive areas such as the

suppression pool. Procedural controls such as monitoring materials used in the restricted zones and the use of laydown mats, lanyards and tool bags minimize this potential; however, it is probable some items will fall into the pool. To mitigate the affect, administrative controls require that items not readily retrieved be reported so an approximation of the quantity of foreign material in the pool can be maintained and assessed for impact on Emergency Core Cooling System (ECCS) operability.

During cycle 6, the lower elevations of the containment were designated as a Zone III housekeeping area which requires material accountability for work activities performed in the zone. This requirement is waived during outages and for individuals transiting through an area but not performing work. Since most of the materials found in the suppression pool were found in areas used for ingress/egress/staging which primarily occurs during outages, it is believed this is when a large portion of the material entered into the suppression pool.

#### Corrective Steps That Have Been Taken and the Results Achieved

The log discrepancies associated with the fuel pool areas were corrected immediately. In addition, the FME coordinator began performing roving inspections to identify log discrepancies and any failure to comply with FME requirements. These actions were performed during the RF-6 outage period. No additional log discrepancies were identified; however, additional isolated instances of poor FME practices were observed. For each, a condition report was generated and immediate corrective actions were taken.

During refueling outage six, a temporary filtration system was installed to improve suppression pool water clarity to assist cleaning and inspection activities which were performed by divers entering the pools to remove debris and inspect the ECCS suction strainers. The items removed from the pool were inventoried and used to perform an operability assessment of the ECCS. The inspections and cleaning activities provide assurance the ECCS will continue to be operable during the current cycle.

The operability assessment concluded the ECCS had remained operable throughout cycle 6. The assessment concluded that a significant majority of debris removed from the suppression pool did not represent a potential for strainer blockage and was not a threat to the reliability of the ECCS. Inspections of the ECCS suction strainers, combined with extended testing of the systems while monitoring suction pressure for indication of degradation, verified the strainers to be free of debris and fully capable of performing their intended safety function.

Subsequent to the outage, the Zone III FME area was expanded from the fuel and suppression pool areas to encompass the entire containment building. In addition, access is primarily restricted to one access point. The required FME controls are posted along with the required log for material and items being brought into the zone. The access point is currently monitored continuously during weekdays and the FME coordinator performs periodic reviews of key card and log entry to further ensure compliance. These actions were implemented to ensure immediate compliance with FME controls until additional long term initiatives are

completed. Subsequent to implementation of the long term corrective actions discussed below, these actions may be re-evaluated.

### Corrective Steps That Will Be Taken to Avoid Further Violations

Administrative procedures currently contain guidance on the use of laydown mats, lanyards and tool bags to prevent material from entering the suppression pool. Training on the proper application of these techniques will be provided to personnel who perform work in containment. Periodic refresher training in these techniques will also be performed. In addition, training will be provided to emphasize the potential impact on safety system performance due to items dropped into the suppression pool, the fuel pools, or other systems interfacing with the pools or the reactor vessel. Also, the need for prompt, accurate reporting of dropped items will be emphasized. In addition, this training will include a discussion of the potential affects on the fuel rods from debris which enters systems interfacing with the reactor vessel.

Supervisor training will be provided, in part, to emphasize the need for supervisors to encourage personnel and reinforce expectations to report items dropped into the pool. In addition, a means to routinely communicate FME issues to personnel will be developed to maintain a heightened awareness of its importance.

For future outages, the Zone III housekeeping restrictions for the lower two elevations of the containment will remain in place until additional physical barriers have been installed to prevent materials from being dropped into the suppression pool.

The appropriate procedures are being revised to remove the requirement to immediately initiate a CR when items are dropped into the suppression pool and cannot be readily retrieved. The current reporting process will be supplemented by a simplified system to allow reports to be filed anonymously and encourage reporting without the perceived fear of negative consequences or the perceived burden of initiating a CR. Subsequently, a CR will be initiated to document the items in the pool. These procedure changes are expected to be completed by July 31, 1996.

To re-emphasize management expectations, the site vice president is distributing a memorandum to site personnel discussing the importance of identifying adverse conditions to management. In addition, these expectations are being reinforced to site supervisors.

The administrative FME control procedure is being revised to make it easier to understand and implement. Additionally, the recommendations provided by the January 1996, FME self-assessment will be considered during this revision. This revision is expected to be completed by July 31, 1996.

A review will be performed for the possible use of alternative materials and work practices for transport of contaminated material and for general maintenance activities occurring within the containment. In addition, a Natural Work Team is being established to assess the overall FME

control program and any additional areas for improvement. This assessment will include a review of materials used for FME control, cleanliness or other purposes inside the containment excluding radiological materials which will be addressed. The Natural Work Team is expected to finalize recommendations by August 30, 1996.

Modifications are in progress to install a permanent suppression pool clean-up system to maintain suppression pool water clarity. This clean-up system will allow ECCS suction strainer and suppression pool floor inspections to be conducted during all modes of operation without the use of divers. Water clarity improvement may also allow debris retrieval activities to be conducted in a more timely manner minimizing any accumulation of foreign debris in the pool. We believe that increased water clarity will contribute to an increase in the reporting of items dropped into the pool by personnel.

Prior to and during refueling outage seven, an evaluation will be performed to review the effectiveness of FME controls.

#### **Date When Full Compliance Will Be Achieved**

Cleaning and inspection activities were completed prior to the end of refueling outage six which provides reasonable assurance that the ECCS systems are capable of performing their intended safety function. The installation of the suppression pool cleanup system is currently scheduled for completion during refueling outage seven. For each instance of poor FME work practices identified around the fuel pools, corrective actions were implemented to address the immediate concern. The evaluation of the FME program will be performed prior to and during refueling outage seven, currently scheduled for September 1997.

## ATTACHMENT B

### REPLY TO A NOTICE OF VIOLATION 50-458/9601-02

#### Violation

Technical Specification 5.4.1 states, in part, "Written procedures shall be established, implemented, and maintained covering the following activities: a. The applicable procedures recommended in Regulatory Guide 1.33, Revision 2, Appendix A, February 1978." Appendix A of Regulatory Guide 1.33 lists activities that should be covered by written procedures, including, "Preparation for refueling and refueling equipment operation," and "Refueling and Core Operations."

Procedure STP-055-0705, "Fuel Handling Platform Operability Test," Revision 9, stated "the main hoist loaded interlock test was satisfied by performance of Step 7.1.10 of the procedure.

Contrary to the above, Step 7.1.10 of Procedure STP-055-0705, completed on January 6, 1996, did not adequately test the fuel handling platform main hoist loaded interlock in that it failed to test one of the contacts associated with the loaded interlock.

#### Reasons for the Violation

Entergy Operations, Inc. (EOI) has determined the root cause to be an inappropriate procedure format. The surveillance test procedure (STP) was inadequate in that it required actions as pre-requisites instead of being included in the performance section. Current administrative controls allow operations to approve the omission of pre-requisite steps after evaluation. In this case, omission of the step would have prevented the fulfillment of the hoist loaded interlock surveillance requirement.

The maintenance task and STP were successfully performed on November 21 and 22, 1996, respectively. These tests were performed within seven days prior to new fuel receipt which began refueling operations for refueling outage six. Subsequent to these tests, the platform was intermittently used until new fuel staging began. The STP was re-performed on January 6, 1996, as a functional retest of the interlock just prior to commencement of new fuel staging. Since no maintenance was performed on the hoist loaded interlocks subsequent to the November tests and successful completion of the STP was performed in January 1996, there is sufficient evidence to conclude the main hoist loaded interlock remained functional during refueling operations which ended on February 10, 1996.

#### Corrective Steps That Have Been Taken and the Results Achieved

A review was performed to identify other similar STPs which required completion of maintenance tasks as a pre-requisite to successfully fulfill the surveillance requirement. No others were identified.

A review of the technical specification (TS)/STP cross reference matrix was performed to identify procedures and work documents, other than STPs, that fulfill surveillance requirements. In addition to the refuel bridge and the fuel handling bridge interlocks, the review identified two surveillance requirements being satisfied by maintenance tasks. These two surveillances performed flow testing for drywell floor drain sump inleakage. The surveillance function being met by these maintenance tasks has been incorporated into a separate STP.

#### **Corrective Steps That Will Be Taken to Avoid Further Violations**

An evaluation of STP-055-0702 and -0705 and the associated maintenance task procedures are being performed to differentiate and separate the activities associated with each procedure. Pre-operation and post operation layup functions will be contained in maintenance tasks and the surveillance/operability requirements will be contained in the STPs.

Corrective actions are being developed to evaluate the adequacy of administrative controls for Technical Specification surveillances being satisfied by procedures that are not in the STP format (i.e. chemistry, environmental, etc.).

The RBS Long Term Performance Improvement Plan includes an upgrade initiative to improve the overall quality of RBS PM tasks.

#### **Date When Full Compliance Will Be Achieved**

Full compliance was ensured based upon review of the main hoist loaded interlock functional testing performed during refueling outage six activities. As discussed above, additional corrective actions are being implemented to prevent recurrence and are expected to be completed prior to refueling outage seven, currently scheduled for September 1997.

## ATTACHMENT C

### REPLY TO A NOTICE OF VIOLATION 50-458/9601-03

#### Violation

Technical Specification 5.4.1 states, in part, "Written procedures shall be established, implemented, and maintained covering the following activities-. a. The applicable procedures recommended in Regulatory Guide 1.33, Revision 2. Appendix A. February 1978." Appendix A-of Regulatory Guide 1.33 lists activities that should be covered by written procedures. including, "Preparation for refueling and refueling equipment operation," and "Refueling and Core Operations."

Fuel Handling Procedure FHP-0001, "Control of Fuel Handling and Refueling Operations," Revision 13, stated, in part, "The Reactor Engineer and spotter shall verify the correct bundle orientation and location prior to the lowering of a fuel bundle..... Prior to grappling or loading fuel assemblies in the core. verify the correct core location ....."

Procedure REP-0029, "Fuel Movement," Revision 2B, stated, in part, "Movement of all nuclear material must be in accordance with and tracked by an approved Fuel Movement Plan..... Fuel shall only be inserted into the core at its designated core loading plan locations."

Fuel Movement Plan FMP-COR-07-03 designated, in Step 1148, that Fuel Bundle YJ2151 be loaded into Cell Location 55-26.

Contrary to the above, on January 21, 1996, fuel handling activities revealed that Fuel Bundle YJ2151 was not loaded into the Fuel Movement Plan FMP-COR-07-03 designated Cell Location 5526, but was misloaded into a different location.

#### Reasons for the Violation

Entergy Operations, Inc. (EOI) agrees with this violation and has determined the root causes to be as follows:

**Less Than Adequate Communications:** Crew turnover did not assure the oncoming crew had an accurate core map to work from. Inaccuracies in the annotation of empty fuel cells contributed to the improper camera placement.

**Less Than Adequate Administrative Controls:** No guidance existed for the limits or expectations of how the core map was to be used and maintained.

**Procedures Followed Incorrectly:** The person responsible for verifying bundle insertion failed to use all available means to perform an adequate verification. The verifier used an

unverified camera insertion hole as a reference point for setting the bundle rather than fixed references such as blade guides, half guides, or core geometry.

**Less Than Adequate Procedure - More Than One Action per Step:** Plan steps for peripheral seating verification required more than one action. In one step, the camera must be moved to the designated core location in addition to verifying the fuel bundle seating. The verification step and the associated fuel seating step must be performed concurrently. The fuel move must not be completed until the camera is in place to verify proper seating.

**Less Than Adequate Human Engineering:** The Fuel Movement Plan resulted in two adjacent (peripheral) holes, which makes verification relatively more difficult as compared to a peripheral hole and an adjacent inner hole. In that case, the camera location spot is more obvious.

During fuel movement, a fuel bundle was being moved into a peripheral location. Adjacent to the target location was another open peripheral hole. The movement step initially required placement of a camera to verify proper seating of the fuel bundle. Using the core map, the spotter identified the first open slot and placed the camera in the core. Subsequently, using the camera as a reference, a fuel bundle was placed in the adjacent location.

The core map used in the above sequence of steps contained incorrect information in that the open holes shown were from a previous move and did not coincide with those currently open. By utilizing the inaccurate core map and subsequently using this location as a reference for placing the fuel bundle, the fuel bundle was misplaced in the core. There was no verification requirement for the camera location since it is only used to verify proper seating. Subsequently, the fuel handler used an unverified camera location as a reference point for locating the fuel bundle and placed the fuel bundle into the incorrect core location.

#### Corrective Steps That Have Been Taken and the Results Achieved

At the time the misload was identified core alterations were halted. Prior to recommencing, an extensive root cause investigation was performed and immediate corrective actions were implemented. Personnel involved with refueling were briefed concerning this event and were made aware of the actions taken prior to resuming any core alterations. The immediate corrective actions are discussed below.

An evaluation was performed which concluded the single fuel misload was well within the analysis assumptions (up to four concurrent misloads are bounded). Additionally, the peripheral location of the misload has a reduced reactivity worth due to edge leakage effects. As such, adequate shutdown margin was not compromised.

The fuel movement plan was revised to correctly reposition the misloaded bundle and verify proper seating. The remaining steps in the fuel movement plan were reviewed to identify any other instances of adjacent holes in the core. Two were identified, with their corresponding alterations expected to occur during the remainder of the present shift. Heightened awareness

during these remaining moves was stressed to the fuel movement team prior to resumption of fuel movement.

The refuel plan was revised for the two remaining peripheral verification steps to ensure bundle insertion prior to camera placement. The reactor engineer/fuel movement supervisor was designated as being responsible for the core map and any information located on it, and was required to remove any information, other than blade guide positions, prior to assuming the watch (every three or four hours).

#### **Corrective Steps That Will Be Taken to Avoid Further Violations**

The fuel movement procedure will be revised to incorporate lessons learned from this event.

A training module will be developed for fuel handlers to discuss this incident including expectations for individual performance at the various positions, shift turnover requirements, and the need for a questioning attitude.

An assessment of human performance errors related to refueling activities will be conducted by an independent industry expert in this area. Results of this assessment will be evaluated for consideration of additional corrective actions.

#### **Date When Full Compliance Will Be Achieved**

Full compliance was achieved when the misloaded bundle was relocated to its proper location. This occurred on January 21, 1996, about eight hours and 19 minutes after the problem was identified. Additional corrective actions are planned to prevent recurrence and are scheduled to be completed prior to refueling outage seven, currently scheduled for September 1997.

## ATTACHMENT D

### REPLY TO A NOTICE OF VIOLATION 50-458/9601-05

#### Violation

Criterion III of Appendix B to 10 CFR Part 50 requires, in part, that measures shall be established to assure that the design basis for safety-related structures, systems, and components is correctly translated into specifications, drawings, procedures, and instructions.

Contrary to the above, the inspectors identified that appropriate measures had not been established to assure that the design basis of the spent fuel pool and reactor cavity pneumatic gate seals were translated into drawings, procedures, and instructions.

#### Reasons for the Violation

Entergy Operations, Inc. (EOI) agrees with this violation and have identified several contributing causes. The root cause determined that administrative controls for both the Corrective Action Reporting and Engineering Evaluation Assistance Request (EEAR) processes were less than adequate in that they failed to ensure implementation of recommended corrective actions. The two key issues are discussed separately below.

#### Gate Seal Preventative Maintenance and Classification

In 1987, a Condition Report (CR) was initiated as a result of a General Electric (GE) Service Information Letter. This letter recommended the installation of protective screens on open drains in the reactor cavity and visual inspection of the pool gates. The CR evaluation recommended inspecting the pool gates prior to use, and/or each time the inflatable seals were replaced. It also recommended determining minimum service life, developing a preventive maintenance procedure, and specifying the minimum and maximum seal air pressure in an operations procedure. During the next refueling outage in 1988, the reactor cavity drains were inspected and found to have the recommended drain covers already installed. Subsequently, the CR was closed by referencing an EEAR for completion of the remaining actions; obtain an engineering evaluation of gate seal service life, minimum and maximum seal air pressures, and inspection requirements for fuel pool gates.

In 1993, the EEAR was closed with actions being issued to generate a maintenance procedure for inspection and replacement of the gate seals. The EEAR addressed seal service life, minimum and maximum seal air pressures, and recommended minimum inspection requirements for both, prior to use and when inflatable seals require replacement. An investigation of these recommended actions did not identify any type of response or follow up.

The EEAR also included an Equipment Qualification Impact Summary (EQIS), which indicated the gate seals do not perform a safety-related function and recommended performing

the manufacturer recommended maintenance. However, reviews completed as part of this investigation concluded that the evaluation to downgrade the seals to nonsafety related was not performed in accordance with administrative procedures in effect at that time. In addition, the vendor-recommended preventive maintenance, which was to replace the seals at the end of the service life, was never performed. Seal service life was re-evaluated subsequent to the recent Fuel Integrity and Reactor Subcriticality inspection and extended from the vendor recommended seven years (service plus shelf life) to a service life of ten years.

At the time the CR was closed, EEARs were not tracked to closure. This method of CR closure and the lack of any follow-up on the EEAR disposition did not provide adequate controls to ensure necessary action items were adequately completed.

#### Backup Nitrogen Supply to Gate Seals

In 1992, incoming industry events information was evaluated by issuance of an EEAR. In response to NRC Information Notice 88-92, Supplement 1, which described a potential for a Spent Fuel Pool drain down event, an EEAR was issued as required by procedure. The disposition of this EEAR concluded RBS had adequate measures (both design features and administrative controls) in place to assure a failure to one or all gate seals would not uncover a spent fuel assembly or control blade assembly stored in a design location or while in transit. Although this EEAR did not address service life of the gate seals, it did address a potential for loss of air to the pneumatic pool gate seals. As a result of this EEAR disposition, several administrative controls were implemented to provide added assurance to prevent water level to drop below the Technical Specification limit of 8'2" above the top of a fuel assembly. The EEAR evaluation also recognized the use of a nitrogen backup system which ensures the gate seals remain inflated in the event of a loss of instrument air.

A review of implementing procedures only identified one maintenance procedure which instructed the installation of the backup nitrogen supply. This procedure stated "Set up a backup nitrogen bottle supply connected to the fuel pool gate seal for emergency use." Further review indicated that this step, along with a requirement to verify adequate nitrogen pressure during daily rounds, were added prior to December 1995.

For this instance, an EEAR which was not considered a corrective action document, was initiated to implement corrective actions. There was no subsequent follow up to ensure the required actions were implemented.

#### Corrective Steps That Have Been Taken and the Results Achieved

An engineering evaluation was performed to evaluate the safety classification and service life of the pool gates seals. The evaluation concluded that the pool gate seals and seal air supplies may be classified as nonsafety-related. However, since the seals are important for personnel protection, certain quality assurance program requirements remain applicable. In addition, the evaluation concluded that three pool gate seals are acceptable for continued use through

refueling outage seven (scheduled for September 1997). The upper transfer pool gate seal was replaced in 1992 and is acceptable for continued use until the year 2002.

As part of the RBS Long Term Performance Improvement Plan (LTPIP), initiatives have been previously implemented, in part, to improve overall configuration control processes. They are:

- The corrective action reporting process has been revised to require tracking of corrective actions until closure and no longer allows closure by referencing another document.
- The EEAR process has been discontinued. Open EEARs were reviewed for possible closure or conversion to another process, such as the CR process where applicable. Currently an Engineering Request (ER) process has been implemented which requires initiation of another document when the disposition results in any required actions.
- Open Modification Requests that were used to close CRs were reviewed and the applicable CR was opened to ensure adequate tracking.

Specific corrective actions are:

PM tasks were established to replace the pool gate seals every ten years.

A System Engineer has been assigned responsibility for containment and fuel building pool gate seals.

A fuel handling procedure has been revised to prohibit the use of control rod blade (CRB) racks in the containment building pools whenever the refueling cavity is drained down.

The current backup nitrogen supply installation for the containment and fuel building fuel pool gate seals was evaluated and determined to be acceptable for temporary service. However, the system did not meet current EOI standards and additional actions are being implemented as discussed below.

#### **Corrective Steps That Will Be Taken to Avoid Further Violations**

Establish any additional preventive maintenance (PM) requirements for the containment and spent fuel pool gate seals and supporting components. These requirements would be in addition to their replacement as described above.

A modification is being evaluated to determine the benefit of installing a permanent backup nitrogen supply system. This modification, if implemented, will remove the requirement for use of a temporary system.

Develop as-built drawings of the existing back-up nitrogen supply piping, tubing, and fittings for the containment and fuel building fuel pool gate seals.

Perform a sample basis surveillance of EEARs to determine if recommended corrective actions identified to support the closure of issues in other processes such as CRs. Industry Experience, etc., have been completed. If any additional discrepancies are identified, additional corrective actions will be considered.

In addition, an evaluation will be performed to identify the need to review similar structural/component relationships. Corrective actions will be established accordingly. The gate seals were considered to be a part of the gate and were not identified as a subcomponent. The gate itself was designated as a structural component.

Detailed instructions for the installation of the nitrogen backup supply system will be developed and added to the appropriate procedures.

Management expectations and established standards for procedures used to install temporary equipment will be reinforced to site personnel responsible for writing procedures.

System operating procedures will be revised to include a caution statement or other guidance requiring written contingency plans 1) prior to draining down both the refueling cavity and the upper transfer pool whenever irradiated fuel is stored in the dryer storage pool, and 2) prior to draining down the refueling cavity to provide adequate water level and cooling in the event of refueling gate seal failure if irradiated fuel is stored in the dryer storage pool.

Alarm response procedures will be revised to instruct operations personnel to shut down any operating spent fuel pool cooling and cleanup pumps before pool level reaches the anti-siphoning holes. This will provide awareness for early indication of a possible gate seal leak and avoid possible pump cavitation damage.

#### **Date When Full Compliance Will Be Achieved**

The fuel pool gate seals are only required for refueling operations. The corrective actions discussed above are scheduled to be completed prior to refueling outage seven, currently scheduled for September 1997.

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E-Mail report to NRR Event Tracking System (IPAS)  
E-Mail report to Michael Davis (MJD1)

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DRS AI 96-G-000045

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