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River Bend Station
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February 18, 1994

U. S. Nuclear Regulatory Commission
Document Control Desk
Washington, DC 20555

Subject: Response to NRC Notices of Violation IR 93-28
Reference: River Bend Station - Unit 1/Docket 50-458/93-28
File Nos.: G9.5, G15.4.1

RBG- 40146

Gentlemen:

Pursuant 10CFR2.201, please find attached Entergy Operations response to notices of violation described in NRC Inspection Report (IR) 93-28. The inspection was performed by Mr. Ward Smith and other Region IV inspection personnel during November 7 through December 18, 1993, of activities authorized by NRC Operating License NPF-47 for River Bend Station - Unit 1.

Should you have any questions, please contact me at (504) 336-6225.

Sincerely,

James J. Fisicaro
Manager - Safety Assessment
and Quality Verification

JJF/jr
enclosures

cc: U. S. Nuclear Regulatory Commission, Region IV
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ATTACHMENT 1

REPLY TO NOTICE OF VIOLATION IR 9328-02

REFERENCE

Notice of Violation - Letter from A. B. Beach to John R. McGaha dated January 20, 1994.

VIOLATION

Failure to implement corrective action which allowed entry by the plant into a condition prohibited by Technical Specification

Criterion XVI, 10 CFR Part 50, Appendix B, requires, in part, that corrective action shall be taken to prevent recurrence of significant conditions adverse to quality.

On June 30, 1993, the licensee inadvertently placed the plant in a condition prohibited by Technical Specification 3.5.1 which requires all three divisions of the emergency core cooling system to be operable when the plant is in Operational Condition 1, and has no action statement that allows the high pressure core spray to be inoperable with either of the other two emergency core cooling system divisions being inoperable at the same time. This is a significant condition adverse to quality and dictates that action be taken within 1 hour to shut down the plant under the provisions of Technical Specification 3.0.3.

Contrary to the above, the licensee failed to implement effective measures to prevent recurrence of the June 30 event and on November 4 while the plant was in Operational Condition 1, Residual Heat Removal Pump (RHR) B was declared inoperable while high pressure core spray was inoperable.

REASON FOR THE VIOLATION

The first event occurred on June 30, 1993, when RHR loop "A" was placed in suppression pool cooling (SPC) mode to lower the suppression pool water level in accordance with the system operating procedures. The unit operator stamped the main control room (MCR) log book for entry into a short term limiting condition of operation (LCO). The short term LCO identified RHR loop "A" inoperable while in SPC mode. This action was not communicated to either the shift supervisor (SS) or control operating foreman (COF) by the shift technical advisor (STA) or unit

operator (UO). At the time this event took place, LCO 93-227 for HPCS was already active due to HPCS pump motor circuit breaker repair. The SS and COF are the individuals who are primarily responsible for Technical Specification interpretation and compliance. The crew did not recognize entry into 3.0.3 due to the communication failure and did not consider alternative action (such as delaying SPC until the HPCS LCO paperwork had been cleared and restored to operable status).

The second event occurred at approximately 2232 on November 4, 1993, when loop B of the low pressure coolant injection (LPCI) system residual heat removal (RHR) system (train B) was inadvertently rendered inoperable while the high pressure core spray system was out of service to support unrelated testing. This condition, HPCS and LPCI - B inoperable, is not specifically addressed by Technical Specification 3.5.1, "ECCS - Operating", and thus required entry into Technical Specification 3.0.3.

Prior to the second event, corrective maintenance had been performed on loop B RHR valve 1E12*MOVFO06B. A tracking LCO had been written to track maintenance and retest requirements. A valve stroke was performed as part of the corrective maintenance procedure and was completed at 1415. A portion of the surveillance test procedure (STP) for loop B RHR valve operability was also specified for retest of the valve, but was believed to be redundant to the previous valve stroke test and therefore, was not performed at that time. At 1510, the HPCS system was declared inoperable in support of unrelated motor-operated valve signature testing. The Operations crew believed that the operability requirements for 1E12*MOVFO06B had been satisfied at 1415, following corrective maintenance on the valve and the subsequent stroke test.

Prior to shift turnover at 1800, based on review of plant priority items, it was revealed that the STP was specified for retest of the valve. Following a discussion with Electrical Maintenance personnel at 2200, a copy of the STP was obtained by the STA and approved for work by the COF. The STP was given to the UO to be performed. The first step in the applicable section of the STP is to close valve 1E12*MOVFO04B, which isolates the suction to the RHR B pump, thereby rendering the LPCI function of RHR B loop inoperable. This action was taken by the UO. Immediately after the UO placed the switch for this valve in the closed position, he and the control room operations crew realized that both HPCS and RHR B were inoperable, a condition requiring entry into TS 3.0.3. After the valve had fully closed, the UO immediately reopened it. The length of time that the valve was closed was approximately 2 minutes.

Investigation of the second event revealed that the COF inappropriately approved the STP for work, since the HPCS system was inoperable at the time. In addition, a caution in the procedure reminds the operator that closing the RHR B pump suction valve will render the loop inoperable and thus, the operator must ensure that at least the minimum number of ECCS systems are operable. This caution was misinterpreted by the UO.

The root cause of the second event was personnel error. The results of the root cause analysis revealed the following:

- The COF failed to recognize that the STP would render RHR B inoperable and therefore inappropriately approved the STP for work.
- The UO failed to correctly interpret and act upon the caution in the procedure. He incorrectly believed that the caution applied only to low pressure ECCS systems and not HPCS.

Contributing factors to the second event were as follows:

- The STA failed to maintain proper oversight of the job by getting directly involved with its performance. This was contrary to the responsibilities of the STA as stated in ADM-0044, "Shift Technical Advisor Program."
- The methodology for signing-in work in the plant had recently changed. The use of a work management center outside of the main control room was implemented approximately one month prior to this event. However, the work management center is only used between 0600 and 1800, Monday through Friday. At all other times, work is signed-in at the main control room. This change in normal operation could have contributed to the occurrence of the second event.
- Work responsibilities of the shift supervisor and the control operating foreman had recently changed. As a result of several identified deficiencies, the COF was relocated to within the at-the-controls area and work was now approved by the SS. In this second event, the SS did not approve the procedure and was not made aware of the performance of the STP until after the RHR loop was rendered inoperable.

- During the shift briefing, the fact that the HPCS system was inoperable was discussed; however, the implications of having this system inoperable were not brought out (i.e., with HPCS inoperable, no work should be performed on any other ECCS system or the RCIC system).
- Surveillance test procedure (STP)-204-6304 was listed as an outstanding item on the tracking limiting condition for operation (TRLCO) for E12*MOVFO06B. This TRLCO was listed as a high priority item for the plant workers to accomplish. The perceived need to complete this task may have projected undue schedule pressure onto the individuals involved.
- Had the control room crew properly used the short term LCO tracking sheet that had been put in place after the first event, the SS would have been aware that the partial STP was to be performed and would not have allowed the RHR valve stroking while the HPCS was inoperable.

The corrective actions taken for the June 30 event were designed to prevent recurrence of the event by ensuring that at least one of the senior licensed operators on shift was informed of the (LCO) condition. This notification was designed to occur before the action was taken to actually enter the LCO. This action provided a barrier to the human error occurring due to incomplete or absence of communications.

The behavioral factors contributing to the second event were fundamentally different from the June 30 event. The second event occurred due to a misjudgment error on the part of the crew which allowed a habit intrusion to influence crew performance. Where the crew had been very thorough in using the short term LCO in other situations, they allowed their familiarity with the systems and the procedure in this event to influence the manner in which they implemented the short term LCO form. Failure to document the intended action and obtain the required acknowledgements on the short term LCO form prior to manipulating the controls prevented the deliberate review for which the form was designed. This, compounded by the failure of the STA to provide the appropriate oversight and inadequate job scoping prior to the surveillance being transmitted to the control room, allowed the second event to occur.

CORRECTIVE STEPS THAT HAVE BEEN TAKEN AND THE RESULTS ACHIEVED

Corrective actions taken included returning the B loop of the RHR system to operable status within minutes by opening valve 1E12*MOVFO04B. Additionally, the operations supervisor and the assistant plant manager-operations were notified of this event within one hour of its occurrence and a condition report (CR) was initiated.

A team which included the individuals involved and an additional nuclear control operator was formed to determine the root causes of the event, any additional contributing factors and develop corrective actions to prevent recurrence. The Operations Department held a meeting with the parties involved in accordance with OSP-0018, "Operations Accountability Review," to support the development of the root cause and corrective actions to prevent recurrence. The results of those reviews revealed the following:

- The River Bend Station administrative procedures governing conduct of operations and the STA program were reviewed and found to adequately address the responsibilities of each crew member.
- The caution in the surveillance test procedure (STP) for loop B RHR valve operability was determined to be adequate to prevent recurrence. The investigation revealed that if the unit operator had asked the COF if the minimum number of ECCS systems were operable, rather than if it was necessary to enter a short-term LCO, a more thorough review of plant configuration would have resulted.
- Additional training was considered as a possible corrective action for this event. Operations training -initial, license and requalification training, all stress the fact that the ECCS systems include HPCS, LPCS, RHR-LPCI and the automatic depressurization system (ADS). Every licensed operator and STA, who is SRO certified, knows this to be the case. Based on the investigation of this event, Operations concluded that the existing training was both adequate and sufficient.

- Personnel changes were made to the crew involved in the second event and management expectations regarding appropriate implementation of the short term LCO form were relayed to all Operations Department shift supervisors, control operating foremen and shift technical advisors.

All individuals involved have been counseled on the significance of this event and the possible consequences of an event of this type. Included in this counseling was emphasis on the need to increase sensitivity to inoperable equipment, and the implications of having equipment such as ECCS systems inoperable. In addition, this counseling included a review of the responsibilities of each crew member. Disciplinary actions were taken by Operations management. Night orders consisting of the CR response documenting this event, were initiated to implement required reading for all operations personnel.

CORRECTIVE STEPS THAT WILL BE TAKEN TO AVOID FURTHER VIOLATIONS

Corrective steps that will be taken to avoid further violations are as follows:

- Discussion of this event will be included in the operator requalification training module with an estimated completion date of April 1, 1994.
- The work control process will continue to be refined to prevent inclusion of non-scheduled work or testing. The work control process provides additional reviews of work and testing by senior licensed individuals to ensure conflicting activities are not scheduled simultaneously. When the June 30 event occurred, the process had recently undergone a change, and the functional responsibilities of the SS/COF had been revised. The second event then occurred when an unscheduled item was allowed to be included in the shift's schedule without the benefit of the full review process.

Operations believes the work control process will now prevent a repeat of an unscheduled test causing the operating crew to feel an urgency to complete an activity when it only aids in closure of a work item that could be reviewed and scheduled under the normal process.

A quality action team (QAT) began meeting January 3, 1994 with the specific goal of identifying root causes and corrective actions for human performance issues in general at River Bend Station. The QAT's mission is to focus on causes of human performance errors including cultural and behavioral issues. In addition, the QAT is expected to provide recommendations that when implemented will create a cultural shift toward zero human performance errors. The results of this effort will also be applicable to other violation responses identified in these attachments.

The long term corrective action that will also help prevent recurrence will be the implementation of Improved Technical Specifications (ITS). The ITS, unlike current Technical Specifications, presents the information in a clear and concise manner in a two column format for ease of understanding and interpretation.

DATE WHEN FULL COMPLIANCE WILL BE ACHIEVED

Full compliance was achieved when RHR B was immediately restored, after discovery, to an operable status.

ATTACHMENT 2
REPLY TO NOTICE OF VIOLATION IR 9328-03

REFERENCE

Notice of Violation - Letter from A. B. Beach to J. R. McGaha dated January 20, 1994.

VIOLATION

Technical Specification 6.8.1 requires, in part, that written procedures shall be established, implemented, and maintained covering the applicable procedures recommended in Appendix A of Regulatory Guide 1.33, Revision 2, February 1978.

Regulatory Guide 1.33, Appendix A, states that maintenance that can affect the performance of safety-related equipment should be properly preplanned and performed in accordance with written procedures, documented instructions, or drawings appropriate to the circumstances.

Contrary to the above, maintenance that affected the performance of safety-related equipment was not performed in accordance with written procedures, in that:

Example 1

On November 22, 1993, the instructions for the work performed in accordance with Maintenance Work Order R137896 required that the foreman check and initial each individual's training matrix. The foreman who signed this sheet did not initial any of the individuals' training matrix.

Example 2

On December 3, 1993, Step 7 of Maintenance Work Order R137897 required an inspection of the motor pinion and key of Valve E22*MOVF012 for proper "as-found" installation, using Corrective Maintenance Procedure CMP-1253, "Limitorque Motor Operated Valves," Revision 9, and the vendor technical manual which required that the key be secured in position by staking the end of the motor shaft keyway. The inspection step was completed and signed off as "Satisfactory," when in fact the key was not secured in position by staking the end of the motor shaft keyway.

IN RESPONSE TO EXAMPLE 1:

REASON FOR THE VIOLATION

The refurbishment and signature testing of motor operated valves (MOV) are performed by the Systems Engineering Valve Group. All work is performed under the control of the applicable maintenance procedures and systems engineering procedures. During the performance of work in the plant, the MOV test engineer performs those functions applicable to the maintenance foreman.

Prior to performing work, in accordance with Maintenance Work Order (MWO) R137896, the MOV test engineer, as foreman, performed the required pre-job briefing and upon completion, the test engineer initialed each individual's training matrix. However, he did not sign as the foreman in the applicable block. Prior to the start of work in the field, a second MOV test engineer assigned to this job and who was present at the pre-job briefing, reviewed the MWO briefing sheet and noted that the first test engineer (or foreman) had not signed the applicable block. At that time the second test engineer (who was actually the lead test engineer), signed, in error, the briefing sheet.

The reason for the violation was due to personnel inattention to detail during the performance of work.

CORRECTIVE STEPS TAKEN AND RESULTS ACHIEVED

Test personnel received instructions on December 6, 1993, stressing the requirements of the briefing sheet. Additional instructions were given to test personnel on December 7, 1993, stressing the standards and expectations on procedure compliance.

IN RESPONSE TO EXAMPLE 2:

REASON FOR THE VIOLATION

On December 3, 1993, MOV test personnel were scheduled to inspect and replace the motor pinion key on valve 1E21*MOVF012. The motor pinion key was being inspected to ensure proper installation per Limitorque Maintenance Update Bulletin 89-1. The replacement of the key was being performed as the result of Information Notice 92-83. Prior to the start of work, the technicians performing the work were briefed on the scope of work, including drawings, and were given specific instructions concerning the proper installation of the motor pinion key.

Upon removal of the motor, the motor pinion key installation was marked "Satisfactory" based on initial inspections. However, during subsequent replacement of the motor pinion key, test personnel determined that the original key inspection was not satisfactory and the first disposition was revised.

A review of the sequence of events revealed that if the motor pinion key had not been required to be replaced that the improperly installed key would have been considered satisfactory and the valve would have been returned to service.

Evaluation of this event indicated that the following factors contributed to the failure to properly inspect the motor pinion key installation.

- The drawings utilized during the pre-job briefing were not at the jobsite at the time of work.
- At the time the MWO was released for work, the test personnel felt that they were under pressure to hastily perform the work.

The reason for this violation is the failure of test personnel to have appropriate procedures at the jobsite to perform the work which is a failure to follow procedure.

CORRECTIVE STEPS THAT HAVE BEEN TAKEN AND RESULTS ACHIEVED

Condition Report 93-0841 was written to address the improper installation of the motor pinion key.

In response to both examples, the human performance issues were addressed by conducting the following briefing sessions on dates indicated, to instruct MOV test personnel on the following subjects.

12/06/93 Pre-Job Briefing Requirements

Subjects covered were:

- * Worker responsibilities under ADM-0028 to have an understanding of the job plan and a commitment for following the job plan safely.
- * The latest procedures and drawings are to be used to perform work.
- * Proper sign off, by the foreman, of training requirements for each worker.
- * Sign off of the foreman's signature block shall be completed by the foreman who completes the training matrix block on the briefing sheet.

12/07/93 Standards and Expectations

Subjects covered were:

- * Strict procedural compliance and, if applicable, procedure revision prior to performing any work step.
- * All the necessary drawings, procedures, and vendor manuals with work package shall be at the jobsite.
- * Schedule pressure is not an excuse for poor worker performance. Workers will stop work and consult with their supervision if unrealistic schedule performance is expected.

12/10/93 Proper Installation of Motor Pinion Keys and How to Identify Unsatisfactory Conditions

Subjects covered were:

- * Proper methods for identification of acceptable motor pinion key installation.
- * Proper installation of motor pinion key per Limitorque Update 89-1.

CORRECTIVE STEPS WHICH WILL BE TAKEN TO AVOID FURTHER VIOLATIONS

The firm of Failure Prevention and Investigation International (FPI) was contacted in late December of 1993 to provide a root cause analysis of recent events that involved personnel errors at River Bend Station (RBS). Even though this event specifically was not selected for review, approximately 180 condition reports from the year 1993 involving human error were selected for review and evaluation. The resultant data was validated by interviews with RBS personnel. The analyses and interviews were focused as to the type of errors that occurred and why, the data of which was compared to licensee event reports from the same period.

FPI will also assess the corrective actions taken and make further recommendations. The results of their analysis are expected in a formal report late February, 1994. The report should provide insight as to underlying causes of the human errors that have occurred at RBS, e.g., organizational or programmatic weaknesses, inadequate training or skills, misjudgment and etc. The benefits of the report will also be applicable to other violation responses described in these attachments.

Other corrective steps to avoid further findings have been completed as described above.

DATA WHEN FULL COMPLIANCE WILL BE ACHIEVED

Full compliance has been achieved.

ATTACHMENT 3
REPLY TO NOTICE OF VIOLATION IR 9328-04

REFERENCE

Notice of Violation - Letter from A. B. Beach to J. R. McGaha dated January 20, 1994.

VIOLATION

Technical Specification 6.8.1 requires, in part, that written procedures shall be established, implemented, and maintained covering the applicable procedures recommended in Appendix A of Regulatory Guide 1.33, Revision 2, February 1978.

Regulatory Guide 1.33, Appendix A, states that maintenance that can affect the performance of safety-related equipment should be properly preplanned and performed in accordance with written procedures, documented instructions, or drawings appropriate to the circumstances.

Contrary to the above, on November 17, 1993, while conducting troubleshooting activities on the reactor core isolation cooling control circuits in accordance with Maintenance Work Order R178922, the work instructions failed to provide a step that would place the appropriate switch in bypass to prevent a reactor water cleanup system isolation. As a result, an inadvertent reactor water cleanup system isolation occurred.

REASON FOR THE VIOLATION

While performing the retest phase of maintenance work order (MWO) R178922 (RCIC Isolation Investigation) the K172 relay picked up and consequently resulted in an isolation of the reactor water clean-up (RWCU) system. A job step to place the (1E31A-S1A) by-pass switch in the by-pass position was not included in the job plan which, if performed, would have precluded the RWCU isolation. The reason the by-pass switch was not included in the job plan was due to the failure of both the planner and the system engineer to follow the relay schematic to its final contact on the one-line diagrams. The RWCU circuitry was completely missed, and therefore, an isolation occurred during subsequent testing. The reason for the violation is lack of attention to detail during the preparation of the MWO package.

An additional causal factor is that the surveillance test procedure (STP) covering the required testing was not found -- although it did exist -- during the development of the MWO package. This was due to the relay not being listed on the STP cross-reference matrix. Had this STP been found, a new retest procedure would not have been required and the existing written procedural steps from the STP could have been incorporated into the MWO.

CORRECTIVE STEPS TAKEN AND RESULTS ACHIEVED

- The planner/system engineer received immediate counseling on the failure to follow the relay circuitry to the final contact.
- The relays that were replaced were successfully retested per MWO R178922.
- The MWO job plan has been revised to ensure STP-207-4240 is the retest specified, should replacement of this relay be required in the future.

CORRECTIVE STEPS WHICH WILL BE TAKEN TO AVOID FURTHER VIOLATIONS

Drawing change notice (DCN) 93-0631 was submitted by System Engineering for approval on November 24, 1993. Once approved, the DCN will provide information that the K3A and K3B relays provide not only a main steam line isolation, but also a reactor water clean-up isolation as well. This omission of relevant information was also considered as a causal factor during the investigation of the root cause. DCN 93-0631 was initiated to provide a more obvious indication that the K3A relay also causes a RWCU isolation. This action will be completed by June 1, 1994.

A request was made to the Maintenance Support Group to add the 1E51A*K100 relay to the "STP to Mark Number Cross Reference List" for STP-207-4240. This cross reference report will provide the users the ability to determine if an applicable STP exists to retest a component in lieu of writing new specific test instructions. The Maintenance Support Group will add the K100 relay to the STP-207-4240 component cross reference list by February 28, 1994. The completed cross reference list associated with the logic system functional test (LSFT) program upgrade, will not officially be issued until December 1994.

Maintenance previously committed to review the maintenance retest program comparing it to the INPO good practices, NMAC guidelines and processes in use at other sites. (Reference Violation IR 9327-02) This review, when completed, will result in recommendations that will strengthen the existing program. An evaluation of the maintenance retest program and resulting recommendations will be completed by February 18, 1994. Once the scope has been identified, a program implementation schedule will be developed.

During the transition period between establishing an enhanced retest program and developing the LSFT cross reference to STP list, Maintenance will provide an interim policy that: 1) defines the role of system engineering as it relates to MWO reviews and approvals, 2) provides direction and guidance for identifying support required on back shifts, 3) defines what constitutes high risk work evolutions and the appropriate design documents required as reference in order to identify applicable retests. This policy and required training will be completed by March 16, 1994.

As a result of this event and other events involving inadequate technical review of test packages, RBS managers have been meeting to determine additional action needed to develop concrete interim steps to prevent recurrence of similar events. Their goal is to guarantee the identification and correction of inadequate procedures, and to assure procedural compliance.

In addition, management at RBS is currently developing a long term performance improvement plan (LTPIP) to achieve continuing improvement in station performance areas. More specific, as it applies to these violation responses, the LTPIP addresses: 1) planning and performance management, 2) leadership, 3) work process efficiency, and 4) problem identification and resolution; all of which contain the human performance element. Improvement in these performance areas once implemented, will result in a permanent acceptable level of human performance achievements.

DATE WHEN FULL COMPLIANCE WILL BE ACHIEVED

Full compliance was achieved the same day (11/18/93) when the system was returned to normal and the test completed. Additional corrective actions will be completed as specified above.