**ENCLOSURE**

U.S. NUCLEAR REGULATORY COMMISSION
REGION IV

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| Docket No.: | 50-458 |
| License No.: | NPF-47 |
| Report No.: | 50-458/96-24 |
| Licensee: | Entergy Operations, Inc. |
| Facility: | River Bend Station |
| Location: | 5485 U.S. Highway 61<br>St. Francisville, Louisiana |
| Dates: | August 12-23, 1996 |
| Inspectors: | S. L. McCrory, Reactor Engineer<br>M. E. Murphy, Reactor Engineer<br>R. E. Lantz, Reactor Engineer<br>G. West, Human Factors Specialist<br>C. P. Goodman, Human Factors Specialist |
| Approved By: | T. O. McKernon, Acting Chief, Operations Branch |

ATTACHMENTS:

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| Attachment 1: | Partial List of Persons Contacted<br>List of Inspection Procedures Used<br>List of Items Opened<br>List of Documents Reviewed |
| Attachment 2: | Operator Simulator Performance Meeting |

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2 EXECUTIVE SUMMARY

River Bend Station
NRC Inspection Report 50-458/96-24

This reactive team inspection observed on shift operator performance and assessed the effectiveness of selected elements of the licensee's licensed operator requalification training program, root-cause analysis process, and self-assessment activities. The inspection was prompted by crew and operator deficiencies exhibited in the plant specific simulator between March and July, 1996.

Operations

- The team concluded that operations in the control room were professional and met management expectations as described in operations policies and facility procedures, with minor exceptions as noted. The team detected no performance decline, negative trends, or negative precursors in operations performance as a result of control room observations (Section O1.1).

- The team concluded that the information obtained through interviews of licensee personnel was consistent with the information contained in the licensee's root-cause analysis and independent assessment of the operator performance issues. The team did not identify any new causal factors as a result of the interviews (Section O5.2).

- The team concluded that there was a weakness in the application of Element 4 to a systems approach to training as described in NUREG-1220. The training staff did not detect that crew behavior was potentially masking individual weaknesses. Additionally, improved performance trending could have helped identify crew and operator weaknesses before they were manifested as inadequate performance in the simulator. However, the team concluded that, overall, the licensee's systems approach to training related to Elements 4 and 5, as applied to the performance of operations personnel, was functioning adequately and that a return to normal regulatory monitoring of the training programs was warranted (Section O5.3).

- The team concluded that recent simulator modeling changes and fidelity discrepancies between the simulator and the control room had not contributed to poor performance by operators on the simulator (Section O5.4).

- The team concluded that the crew reconstitution process lacked a well-defined structure and that the guidelines (objectives and criteria) provided to the operations shift superintendents were not consistently understood or applied (Section O6.1).

- The team concluded that the interaction and communication between training and operations departments warranted improvement, especially during times of major

changes that affected both departments. More attention to stabilizing the training management organization was warranted (Section O6.2).

- The team concluded that the root-cause analysis system was well implemented. The inclusion of root cause analysis reports as part of the condition reports was effective in identifying the root causes of the specific problems. The root-cause analysis assessments were conducted by experienced, well-trained personnel and were technically thorough, used appropriate methodologies, incorporated operating experience, and underwent management review. The depth of the analysis was commensurate with the safety significance of the problems identified (Section O7.1).

- The team differed with the licensee's root-cause determination. The team concluded the failure in the training evaluation process to detect masking of individual weaknesses as a root cause. Additionally, the team assessed the causal factors that supported the root cause related to management decisions as representative of a weakness in managing change. The distinction of the team's perspective was that it addressed the framework in which decisions were made rather than only acknowledging that some of the decisions may have been poor ones (Section O7.1).

- The team concluded that the condition report process was effective in developing timely, systematic corrective actions that provided appropriate problem resolution. However, the team noted that, in a few cases, corrective actions did not identify the desired condition that the corrective actions were intended to achieve (Section O7.2).

- The team concluded that the licensee's corrective action program was effective in implementing timely and appropriate corrective actions (Section O7.3).

- The team concluded that the licensee's self-assessment efforts were effective in both identifying and proposing corrective actions for weaknesses in training and operations (Section O7.4).

## Report Details

### Summary of Plant Status

The plant operated at full power during the entire inspection period. There were no operational occurrences that impacted this inspection.

## I. Operations

### O1 Conduct of Operations

#### O1.1 Control Room Observations (71715)

a. Inspection Scope

The team observed operations in the main facility control room between August 5 - 9 and 19 - 23, 1996. The team observed all aspects of shift crew performance, including communications, command and control, shift relief, work authorization, control room conduct and formality, annunciator response, and response to events outside the control room. The team compared the observed performance with expected performance as described in the facility's policies and procedures.

b. Observations and Findings

The team observed routine communications between control room operators to be formal, three-legged, concise, and unambiguous. Communications with operators outside the main control room were also formal and three-legged. However, in one instance, the team observed where effective communications with a local operator at the division III high pressure core spray diesel generator was challenged during a surveillance test. The surveillance test required coordination between a licensed reactor operator in the control room and a local operator at the high pressure core spray diesel generator. Both the control room and local operator wore sound-powered phone headsets. Following a successful start of the high pressure core spray diesel generator, the control room operator repeated his communications several times and spoke in an elevated voice until he could confirm that the local operator understood the communications. The control room operator also repeatedly requested that the local operator repeat his communications due to difficulty in hearing. The elevated volume, which the control room diesel operator used, presented an intermittent distraction to the at-the-controls operator during the approximately 1-1/2 hours that the high pressure core spray diesel generator was running. The inspector questioned the control room supervisor about the normal conduct of this surveillance, who stated that this was the normal communications method during the diesel generator surveillance, and that the difficulty in hearing was standard. The licensee stated that although not ideal, the communications were adequate to perform the test and that the distraction to the at-the-controls operator was minimal.

Control room conduct was formal. Senior reactor operators were routinely involved with shift activities and maintained a professional environment in the control room. The at-the-controls operator was diligent in maintaining control board observations at the reactor controls "680" panel. One minor exception was noted when an off-shift, licensed reactor operator was observed in the at-the-controls area talking quietly to the at-the-controls operator for approximately 20 minutes. Although this was only a minor distraction to the at-the-controls operator, the conversation was not a plant-related activity as required in Operations Policy #15, "Control Room Conduct."

Operators consistently responded to control room annunciators and referred to the applicable alarm response procedure if the annunciator was new or unexpected. The reason for the annunciator was consistently communicated to the senior reactor operators or reported and then investigated when the cause was not known. In one exception, the control room operators were forewarned to expect specific alarms where an annunciator was caused by testing or surveillance activities. The exception was a central alarm station security alarm that sounded in the control room due to testing by security. Security had not informed the control room to expect the annunciator as required by Operations Policy #3, "Communications." This caused a minor distraction to the control room operators that could have been avoided.

The team observed one crew's response to an unannounced fire drill and a second crew's response to two off-normal events. The unannounced fire drill initial notification was received by the unit operator, reported to the control room supervisor and the at-the-controls operator, and then properly alarmed with a general plant announcement in accordance with the controlling administrative procedures. The first off-normal event was the occurrence of a real fire in the paint shop. The crew response followed the correct procedures and the fire brigade responded in a timely manner. The fire was out when the brigade arrived and the only damage was to an air compressor bearing that had initiated the fire. Control room conduct was professional and subdued with very little distraction to the normal routine. The second off-normal event was an injury to an individual at the security training facility. This event escalated to the need for an ambulance response and notification of the NRC senior resident inspector by the control room supervisor. Again, the control room conduct was professional, with only minor distractions to the operators.

The team observed three shift turnovers from the arrival of the relief crew in the control room through the post relief crew brief. The team noted that the individual operator reliefs were thorough and detailed, and that both the oncoming and offgoing operators were alert and diligent in providing a professional turnover. Post relief crew briefs were thorough and comprehensive with each member of the crew providing a status of activities and equipment for their areas.

c. Conclusions

The team concluded that the conduct of operations in the control room was professional and met management expectations as described in operations policies and facility procedures, with minor exceptions as noted. The team detected no performance decline, negative trends, nor negative precursors in operations performance.

**O5 Operator Training and Qualification**

O5.1 General Comments

As a result of operator and crew performance weaknesses exhibited in evaluated or observed simulator scenarios on several occasions since March 1996, the NRC determined that a reactive inspection of the licensee's licensed operator requalification training program was warranted. Using Inspection Procedure 41500 and NUREG-1220, "Training Review Criteria and Procedures," the team evaluated Elements 4 and 5 of the licensee's systems approach to the training process. The team relied on interviews, document reviews, and control room observations to accomplish the inspection.

O5.2 Operator Interviews

a. Inspection Scope (41500)

The team interviewed the operations personnel regarding their understanding of crew and operator performance issues, changes in continuing training focus, simulator scenario difficulty, training program evaluation, simulator performance, reconstitution of the crews, and corrective actions. The team interviewed the operations manager, the operations superintendent, five operations shift superintendents, two shift technical advisors, four control room supervisors and five nuclear control operators.

b. Observations and Findings

All operations personnel interviewed were aware of River Bend's internal root-cause assessment and the independent panel assessment of the issues surrounding poor performance by operators in the simulator.

As a result of the interviews, the team obtained the following insights related to crew performance issues from March through July 1996.

- Crews were reconstituted at the end of the January-February outage and returned to normal power operations with limited simulator training as newly reconstituted crews.

- Reconstituted crews did not receive team building training until several weeks after resuming normal shift operations.

- The training time on the simulator on a per individual and crew basis was reduced when an additional non-training week was added to the end of each training module. The condition worsened when the number of crews went from five to six.

- The number of simulator instructors had been reduced by 50 percent with the resources being redirected to the training material upgrade activity. The work load for the remaining instructors more than doubled since the number of crews had gone from five to six.

- The effectiveness of the crew lead instructor program was significantly reduced.

- The trending of training program effectiveness and individual and crew performance had declined and was not regularly assessed to identify training needs.

- During simulator evaluations, instructors had not assured that all operators were equally challenged to demonstrate their capability in all assigned responsibilities. Thus, crew behavior masked individual weaknesses.

- In 1995, the licensee had begun to evaluate crews in the simulator on the first day of the training week to assess their "as found" capability. Some operators believed that the lack of opportunity to prepare for those evaluations contributed to the recent performance weaknesses. Additionally, operators expressed concern that an unreasonably high use of catastrophic accident scenarios contributed further to the performance problems.

c. Conclusions

The team concluded that the information obtained through interviews of licensee personnel was consistent with the information contained in the licensee's root-cause analysis and independent assessment of the operator performance issues. The team did not identify any new causal factors as a result of the interviews.

O5.3 Licensed Operator Training Program Review

a. Inspection Scope (41500)

The team evaluated the licensee's operations training program regarding Elements 4 and 5 of a systems approach to training as described in NUREG-1220. Element 4, "Trainee Evaluation," included the relationship between test items and job requirements, the evaluation of trainee performance to determine progress,

continuing training to maintain or improve skills, and evaluation of trainee mastery of job-related task performance skills. Element 5, "Program Evaluation," included the collection and use of several types of feedback on training program effectiveness to modify the training program content to meet the changing needs of the operations personnel.

b. Observations and Findings

The licensee had previously identified, through their self-assessment activities, that the simulator training and evaluation staff had not been assuring that all operators were evaluated in all crew positions for which they were qualified. The team interviewed training staff personnel and confirmed this previously identified weakness in the evaluation process. The licensee had not tracked the positions in which operators were being evaluated in the simulator. As a result, crews were compensating for weak operator capability by aligning themselves to place stronger operators in the more challenging positions during evaluations. This compensatory measure had the effect of masking weak operator capabilities. After the reconstitution of the crews, such compensatory measures were not taken because the crew members were unfamiliar with one another's strengths and weaknesses. That resulted in the identification of some operator weaknesses. In July 1996, the licensee had begun tracking the positions in which each operator was evaluated to ensure that each operator would be comprehensively evaluated during the 2-year requalification cycle.

The team reviewed the licensee's performance trending of control room operators and crews. The team found that the licensee's trending of control room operators and crews prior to July 1996 was ineffective in providing precursor data on recent operator and crew failures. Prior simulator trending data were limited to pass and failure of crews, instructor evaluator comments, and classroom and simulator critiques by operations personnel. Interviews indicated that contemplated simulator trending data included identifying repeat scenarios across crews that present training opportunities, instructor grades, observations by senior operations staff in the simulator, developing performance measures on the quality of operator and crew performance (e.g., the type of tasks operators perform during simulator training), and crew and individual passes with remediation.

During interviews, some operators indicated a lack of confidence that completion of simulator training during a requalification training week would assure that they could pass a simulator evaluation at the beginning of the next requalification training week without any additional preparation. While most operators interviewed stated that they believed that they could pass the simulator evaluation without any additional preparation, some stated that without some additional preparation (e.g., on-the-job training and extra simulator time) they were not confident they would pass the simulator evaluation. The interval (possibly as long as 12 weeks) between requalification training weeks was the principal reason for this lack of confidence. Several operators expressed concern that the extensive use of catastrophic, "crash

and burn" scenarios helped create an incorrect perception of operator capability. "Crash and burn" scenarios typically had multiple failures in connection with a design-basis accident or event, required exhaustive application of the emergency operating procedures, and often progressed rapidly. The licensee's root-cause analysis and independent assessment had identified two of these scenarios with which the operators had the most difficulty. However, the licensee had performed a risk analysis that indicated that the core damage frequency was essentially unaffected even accounting for the identified crew weaknesses. Nevertheless, the licensee expressed an intent to improve operator and crew ability to respond to all scenarios designed to exhaustively exercise the emergency operating procedures.

The licensee had identified that reduced simulator time was a root cause for the operator and crew performance weaknesses exhibited since March 1996. The licensee had addressed this concern by permitting crews to schedule additional instructor-supported simulator time during the training module off-weeks. At the time of the inspection, this action was a temporary measure, and the licensee had not yet determined a long-term corrective action for the root cause.

The team reviewed training feedback information and determined that information was being collected both formally and informally. The primary formal collection method was by use of the classroom or simulator student course feedback forms. The informal collection methods used by the training department included e-mail, telephone conversations, and face-to-face conversations. Operators generally expressed satisfaction with the treatment of their input to the feedback process. However, a significant number of operators interviewed stated that the feedback they received on their simulator performance was objective, but not prompt. In a number of instances, evaluations performed on Monday frequently were not reviewed with operators until Thursday. The licensee expected this concern to be addressed by increasing the number of simulator instructors. The team reviewed the response to selected formal feedback and confirmed that problems once identified and entered into the feedback process were generally handled well. Most of the findings of the licensee's root-cause analysis and independent assessment related to needed change or enhancement to the training program had not been previously identified and input through the training program feedback process. The resultant corrective actions and enhancements included providing more simulator time, providing more simulator instructors, upgrading the training materials, and re-emphasizing the training instructor lead program.

c. Conclusions

The team concluded that there was a weakness in the application of Element 4 to a systems approach to training in that the training staff did not detect that crew behavior was potentially masking individual weaknesses. Additionally, improved performance trending could have helped identify crew and operator weaknesses before they were manifested as inadequate performance in the simulator. However, the team concluded that, overall, the licensee's systems approach to training related

to Elements 4 and 5 as applied to the training of licensed operator personnel was functioning adequately and that a return to normal regulatory monitoring of the training programs was warranted.

O5.4 Training and Evaluation Scenarios (41500)

The team reviewed simulator scenarios used in licensed operator training and requalification over the past year. The team assessed the difficulty and the validity of the scenarios to determine whether there had been significant changes in the nature, scope, or difficulty of the scenarios. The team evaluated whether any recent model changes in the simulator caused or contributed to poor performance by operators on the simulator. The team concluded that the simulator scenarios used during the recent licensed operator and crew requalification failures were not more difficult than previous requalification scenarios. On the basis of interviews, the team concluded that recent simulator modeling changes and fidelity discrepancies between the simulator and the control room had not contributed to poor performance by operators on the simulator.

**O6 Operations Organization and Administration**

O6.1 Operations Crew Staffing

a. Inspection Scope (41500)

The team reviewed the efforts of the licensee to develop adequate reconstituted operating crews after refueling outage six. The team reviewed licensee documentation addressing shift crew composition and supervisory operations personnel to determine the methodology associated with the crew reconstitution.

b. Observations and Findings

The team reviewed licensee documentation and observed that the following personnel changes had occurred during crew reconstitution:

- Six nuclear control operators moved to on-shift positions.
- Two nuclear control operators moved away from on-shift positions.
- Four control room supervisors moved to on-shift positions.
- Three control room supervisors moved away from on-shift positions.
- Three operations shift superintendents moved to on-shift positions.
- Two operations shift superintendents moved away from on-shift positions.

Additional personnel moves occurred after the reconstitution, but none significantly affected the makeup of the reconstituted crews.

The team reviewed the experience level as a function of the crew. As evident in the table below, the number of years of license experience across the crews did not vary significantly when River Bend changed from a five-crew to a six-crew rotation.

Distribution of Years of License Experience Among Crews

| Years Licensed | Crew A | | Crew B | | Crew C | | Crew D | | Crew E | | Crew F | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Before | After | Before | After | Before | After | Before | After | Before | After | Before | After |
| 9-12 | 1 | 1 | 1 | - | - | 2 | 1 | 2 | 1 | 1 | - | 1 |
| 3-8 | 4 | 3 | 3 | 2 | 5 | 2 | 2 | 4 | 2 | 3 | - | 2 |
| <3 | 1 | 2 | 2 | 3 | 1 | 1 | 2 | - | 2 | 1 | - | 3 |

In conducting the crew reconstitution, licensee management decided to involve the operations shift superintendents in the process. Two of the operations shift superintendents interviewed stated that they were given criteria with regard to their input, and at least one other operations shift superintendent stated that he received no criteria. The criteria as discussed during the interviews were not consistent. Some of the criteria listed by the operations shift superintendents were as follows:

- Mix license experience
- Balance Fire Brigade qualifications
- Consider number of startups participated in
- Match compatibility of the control room supervisor with the nuclear control operators
- Make the six crews "equally qualified"

Operations personnel interviewed listed the following items as issues they believed were to be resolved during the crew reconstitution:

- Move from five-crew to six-crew rotations
- Move newly-licensed control room supervisors from office positions to on-shift positions
- Move newly licensed nuclear control operators from office positions to on-shift positions

- Redefine the role of the shift technical advisor

Operations managers took the input developed by the operations shift superintendents and individual performance information that had been compiled to determine candidates for "hot license" training and made the final determination on crew composition. The information used by the managers included individual summary performance data such as training examination scores, simulator performance, job performance, and personal performance errors. The team asked if the same level of effort in compiling individual performance information would have been applied if there had been no "hot license" consideration. The operations managers remarked that there was no assurance that the same level of effort would have been applied if there had not been a "hot license" consideration.

c. Conclusions

The team concluded that the crew reconstitution process lacked a well-defined structure and that the guidelines (objectives and criteria) provided to the operations shift superintendents were not consistently understood or applied.

O6.2 Operations and Operations Training Staff and Interaction

a. Inspection Scope (40500, 41500)

The team interviewed licensee staff members responsible for and/or active in the communication interaction between the operations and training organizations.

b. Observations and Findings

During interviews, some operations personnel remarked to strengths in the interaction between operations and training. One example concerned an effort to better relate the training objectives and topics to the overall objectives of the operations department. The targeted objectives focused on areas that included reactivity control, board awareness, procedure use, conservative decision-making, and questioning attitude. In contrast, several operators indicated that over the last year the training instructor's lead program had gone from an effective and viable program to essentially a paperwork function due largely to the reductions in the training staff. This program provided valuable feedback to the training department on the training needs in operations. With the restoration of training instructors to the former levels, most operations and training personnel stated an expectation that the lead instructor program would once again become effective.

Operations and training personnel stated that, during times of change, miscommunications have occurred between the organizations. One such example occurred in 1994. At that time, operations transferred the database on crew competencies and training module performance to the training department. Operations assumed that the database would continue to be developed by training;

however, the assistant for technical operations reported, during an interview, that this was not the case. During a recent exchange of responsibility of the operations training supervisor and the superintendent of operations, a previous training activity was discontinued. The discontinued activity was later brought to the attention of the new operations training supervisor and it was reinstituted. Several of the personnel interviewed indicated that many of the changes in operations and training noted above had not been thoroughly discussed between operations and training to understand their full impact.

During an interview, the training manager confirmed that there has been a high turnover rate in the training manager and operations training superintendent positions. There have been five training managers and three operations training superintendents over the past 5 years. The current training manager believed that the communication interface between operations and training had been adversely impacted by the lack of stability in the training management organization.

c. Conclusions

The team concluded that the interaction and communication between training and operations warranted improvement, especially during times of major changes that affected both departments. Further, more attention to stabilizing the training management organization was warranted.

## O7 Quality Assurance in Operations

### O7.1 Root-cause Analysis

a. Inspection Scope (40500)

The team evaluated the licensee's Root Cause Analysis Report, "Operator Performance in the Simulator," CR 96-1245 dated July 29, 1996, to independently determine the root causes and contributors. The team also reviewed two additional broad scope licensee root-cause analyses (listed below) related to operator training, teamwork, and communications to determine the depth, scope, and rigor of the root-cause analysis.

- Root Cause Analysis Report, "Unanticipated Response to Manipulation of a Remote Shutdown Panel Transfer Switch," CR 94-0181, April 7, 1995.

- Reactor scram during performance of "Containment and Drywell Manual Isolation Actuation Channel Functional Test," SERT Report for Scram 94-03, CR 94-1555, December 1994.

The team evaluated the licensee's root-cause analyses against Procedure RBNP-022, Revision 3, "Root Cause Analysis Program," dated September 22, 1994. Additionally, the root-cause analyses were evaluated against

the guidelines obtained from "Guidelines for Evaluating Corrective Action Plans for Nuclear Power Plant Communications Related to Events" (Science Engineering Associates Technical Report No. 1554-080 prepared for the NRC, December 4, 1995) and draft NUREG-1545, "Communications Corrective Action Plans: Review Criteria."

b. Observations and Findings

The licensee's Root Cause Analysis Report, "Operator Performance in the Simulator," CR 96-1245, dated July 29, 1996, gave the factors listed below as the basis for performing a root-cause analysis. The Corrective Action Review Board had not reviewed the report at the time of the inspection.

- Institute of Nuclear Power operations evaluation in March 1996
- The NRC emergency preparedness exercise report in March 1996
- The emergency preparedness program inspection in June 1996
- Four crew failures and several individual failures

The licensee root-cause analysis determined that there were two principal root causes each with multiple causal factors. The following root causes were extracted from condition report 96-1245:

- Operations and Training management decisions resulting in less than adequate operator performance in the simulator including:

  (1) The addition of a second non-training week to the module rotation. There are now two weeks per module not used for training to enable training instructors to process and maintain training records and provide time for them to prepare for upcoming module training.

  (2) A training department outage after the refueling outage to upgrade training material. For operations requalification training, this lasted approximately 10 weeks.

  (3) The reduction of the training staff and the use of rotational operation personnel to fill instructor positions has caused a loss of training experience and knowledge in the training organization.

  (4) Training department staffing refueling outage positions and simulator training being stopped for that period and not resumed immediately after the outage. Due to the scheduling and, in small part, the delay in getting training personnel back from the outage, there was no scheduled training for approximately 5 weeks following the end of the refueling outage. (A total of 12 weeks without training.)

(5) The failure of OTEC *[Operations Training Evaluation Committee]* to trend and monitor long-term performance of individual operator performance.

(6) The acceptance of reduced contact time for operators in the simulator as a result of the training outage, delay in starting training after completion of the refueling outage.

(7) The development of six new crews at the same time without full recognition of the impact on the team concept with the new crews.

- The reduced staff and ineffective distribution of the training instructors qualified to teach in the simulator resulted in:

  (1) An increase in the student/trainer ratio during simulator training scenarios from the past ratio of 3 to 1 to the current ratio of 6 to 1.

  (2) Inconsistent use of the instructor crew lead program, the inability to always prepare for classroom instruction, the inability to provide professional development of soft skills training for instructors and long delays in inputting evaluation results into the operator trending database.

The licensee's independent assessment identified that not all operators were being evaluated in all of the positions for which they were qualified. During evaluated scenarios, crews routinely arranged themselves to ensure that the strongest operators were in the more challenging positions. That resulted in individual performance weaknesses being masked. At the time of the inspection, the licensee had not considered this as a root cause or major causal factor although they acknowledged it as a significant matter.

The root-cause analyses of Condition Reports 94-0181 and 94-1555 conformed to the licensee's procedural requirements and the additional guidelines used by the team.

Condition Report 96-1245 indicated that 188 potential causes (in nine general areas) had been considered; however, only the two general areas finally considered as root causes were described in the report. The root-cause analysis did not identify what other root causes were considered and how those root causes were eliminated. The licensee indicated that in the final version of the report, the root-cause section would be strengthened to answer what root causes were considered and which ones were selected as actual root causes and why. In all other respects the root-cause analysis of Condition Report 96-1245 conformed to the licensee's requirements and the team's assessment guidelines.

Most of the individuals interviewed agreed with both the root-cause analysis and associated corrective actions. One individual disagreed that the quality of simulator training was a root cause and noted that ensuring that corrective actions were completed would be a challenge. Another individual disagreed that operators' professionalism in the simulator and lack of scenario difficulty were valid findings.

The team interviewed licensee staff members responsible for root-cause analysis to gain further insight into how the process was applied. The team determined that when a comprehensive root-cause analysis was completed, the root-cause assessors conducted a thorough evaluation, used several appropriate root-cause methodologies, and identified well-thought-out root causes.

c. Conclusions

The team concluded that the root-cause analysis system was well implemented. Root-cause analysis reports as part of the condition reports were effective in providing the root causes of the identified problems. The root-cause analysis assessments were conducted by experienced, well-trained personnel and were technically thorough, used appropriate methodologies, incorporated operating experience, and underwent management review. The depth of the analysis was commensurate with the safety significance of the problems identified.

The team differed with the licensee's root-cause determination. The team concluded the failure in the training evaluation process to detect masking of individual weaknesses was a root cause. Additionally, the team assessed the causal factors that supported the root cause related to management decisions as representative of a weakness in managing change. The distinction of the team's perspective was that it addressed the framework in which decisions were made rather than only acknowledging that some of the decisions may have been poor ones.

O7.2 Corrective Action Development

a. Inspection Scope (40500)

The team evaluated the licensee's corrective actions developed as a result of the three condition reports previously discussed. The review evaluated the degree to which the corrective actions responded to the root-cause analysis. The procedures and guidelines described in Section O7.1.a provided the standards against which the team assessed corrective action development.

b. Observations and Findings

Several of the recommended corrective actions of Condition Report 96-1245 lacked specific linkages to all of the causal factors and did not contain objectives by which the effectiveness of the corrective action could be measured. However, the

licensee was still reviewing the "Recommended Corrective Action Plan" at the time of the inspection and acknowledged the shortcomings of the recommended corrective actions. The team determined that an inspection followup item was warranted to review the final corrective action plan.

The corrective actions of Condition Reports 94-0181 and 940-1555 met the licensee's requirements and the team's evaluation guidelines in most respects. The team noted that a few corrective actions did not clearly identify the desired condition that the corrective actions were intended to achieve.

c. Conclusions

The team concluded that the condition report process was effective in developing timely, systematic corrective actions that provided appropriate problem resolution. However, the team noted a few cases in which corrective actions did not identify the desired condition that corrective actions were intended to achieve.

The corrective action plan related to Condition Report 96-1245 had not been finalized at the time of the inspection. The final corrective action plan will be reviewed in a future inspection (50-458/96024-01).

O7.3 Corrective Action Effectiveness

a. Inspection Scope (40500)

The team reviewed the immediate and short-term corrective actions that the licensee had already implemented with respect to Condition Report 96-1245. The team also reviewed the completed corrective action documentation to assess the effectiveness of corrective actions for Condition Reports 94-0181 and 94-1555 and the licensee's corrective action response to NRC Inspection Report 50-458/95-07, Section 5.1.2. The report noted ineffective communication and emergency operating procedure usage weaknesses in the simulator. Corrective action effectiveness was evaluated against the requirements and guidelines in Section O7.1.a. above, as well as the requirements of Site Policy R-PL-012, Revision 0, "Corrective Action Program," dated June 19, 1995.

b. Observations and Findings

At the time of the inspection, the licensee had implemented the following immediate and short-term corrective actions.

- An additional 8 hours of simulator time was scheduled into the current training module.

- The instructor to student ratio in the simulator was raised.

- Every crew was being evaluated in each training module.

Operators interviewed reported positive results from the increase in simulator time and instructor ratio. However, insufficient data had been generated to assess the effectiveness of the crew evaluations every training module. Most long-range and on-going corrective actions were not yet approved at the time of the inspection and, therefore, could not be assessed.

The licensee's corrective action to NRC Inspection Report 50-458/95-07 was to review the observations made by the NRC staff and present those observations to operators during Module 3 in 1995.

The documentation of the corrective actions in Condition Reports 94-0181 and 94-1555 confirmed that all corrective actions had been completed as planned and with the desired results.

c. Conclusions

The team concluded that the licensee's corrective action program was effective in implementing timely and appropriate corrective actions.

The effectiveness of the corrective actions associated with Condition Report 96-1245 will be assessed in a future performance based inspection (50-458/96024-02).

O7.4 Licensee Self-Assessment Review (40500)

The team reviewed the licensee's most recent self-assessments of operator performance and training titled, "RBS Self-Assessment - Operations," dated July 1996 and "RBS Mid-SALP Self-Assessment - Training Department," dated June 1996. The team evaluated if these self-assessment and monitoring activities were of sufficient scope and rigor. The team concluded from their evaluation that the licensee's self-assessment efforts were effective in both identifying and proposing corrective actions for weaknesses in training and operations.

## V. Management Meetings

**X1 Exit Meeting Summary**

The inspector presented the inspection results to members of licensee management at the conclusion of the inspection on August 23, 1996. The licensee acknowledged the findings presented.

The inspector asked the licensee whether any materials examined and retained by the inspection team should be considered proprietary. No proprietary information was identified.

## X3 Management Meeting Summary

At the request of the licensee a meeting was held in the Region IV office on August 15, 1996, prior to the on-site inspection. During the meeting, the licensee presented the results of their recent root-cause analysis of operator and crew performance deficiencies observed in the plant-specific simulator. The presentation also reviewed the results of an independent assessment led by the Entergy Operations, Inc., corporate office. Attachment 3 contains the summary of the information provided at that meeting.

ATTACHMENT 1

PARTIAL LIST OF PERSONS CONTACTED

Licensee

J. P. Dimmette, General Manager, Plant Operations
D. T. Dormandy, Manager, System Engineering
E. C. Ewing, Manager, Training
R. J. King, Director, Nuclear Safety and Regulatory Affairs
M. A. Krupa, Manager, Operations
D. N. Lorfing, Supervisor, Licensing
G. A. Zinke, Manager, Quality Assurance
G. R. Maxon, Senior Lead Engineer
W. J. Trudell, Operations Training Supervisor
T. R. Leonard, Director, Site Engineering
L. W. Woods, Operations Superintendent
J. R. McGaha, Vice President-Operations
P. LeFort, Supervisor, Training Support
P. G. Barker, Technical Specification IV
S. R. Radebaugh, Outage Coordinator
I. M. Malik, Supervisor, In House Events Assessment
T. O. Brice, Senior Chemistry Engineer
J. C. Sutherland, Training Supervisor
H. B. Hutchens, Superintendent, Plant Security
A. F. Spencer, Operations Coordinator
W. P. O'Malley, Operations Coordinator
R. J. Alexander, Manager, Project Management

NRC

L. J. Callan, Regional Administrator, Region IV
T. P. Gwynn, Acting Deputy Regional Administrator, RIV
K. E. Brockman, Acting Director, Division of Reactor Safety
G. M. Tracy, Acting Deputy Director, Division of Reactor Safety
P. H. Harrell, Chief, Reactor Project Branch
J. L. Pellet, Chief, Operations Branch
T. O. McKernon, Senior Reactor Inspector

LIST INSPECTION PROCEDURES USED

| | |
|---|---|
| 41500 | Training and Qualification Effectiveness |
| 40500 | Effectiveness of Licensee Controls in Identifying, Resolving and Preventing Problems |
| 71715 | Sustained Control Room and Plant Observation |

## LIST OF ITEMS OPENED

Opened

| | | |
|---|---|---|
| 50-458/96024-01 | IFI | Corrective action plan review |
| 50-458/96024-02 | IFI | Assess corrective action effectiveness |

## LIST OF DOCUMENTS REVIEWED

"Root Cause Analysis Report," CR 96-1245, related to "Operator Performance in the Simulator," dated July 29, 1996

Root Cause Analysis Report, "Unanticipated Response to Manipulation of a Remote Shutdown Panel Transfer Switch," CR 94-0181, 4/7/95.

Reactor scram during performance of "Containment and Drywell Manual Isolation Actuation Channel Functional Test," SERT Report for Scram 94-03, CR 94-1555, 12/94.

"RBS Self-Assessment - Operations," dated July 1996

"RBS Mid-SALP Self-Assessment - Training Department," dated June 4, 1996

"Root Cause Analysis Program," Procedure RBNP-022, Revision Number 3, September 22, 1994.

"Initiation and Processing of Condition Reports," Procedure RBNP-030, Revision Number 9, July 12, 1996.

"Corrective Action Program," Site Policy No. R-PL-012, Rev. No. 0, June 13, 1995.

"Simulator Training," Procedure R-DAD-TQ-011, Revision 0, March 9, 1995.

"Station Training Program," Procedure R-SAD-TQ-005, Revision Number 4, August 5, 1996.

"Conduct of Operations," ADM-0022, Revision 18A

"Communications," Operations Policy #3

"Control Room Conduct," Operations Policy #15

ATTACHMENT 2

OPERATOR SIMULATOR PERFORMANCE MEETING

ENTERGY

# OPERATOR SIMULATOR PERFORMANCE MEETING

**River Bend Station** **15 August, 1996**

# OPERATOR
# SIMULATOR PERFORMANCE
# MEETING AGENDA

| | |
|---|---|
| Introduction | Rick King<br>Director - Nuclear Safety<br>& Regulatory Affairs |
| Opening Remarks | Joel Dimmette<br>General Manager -<br>Plant Operations |
| Performance Overview<br>Operator Performance<br>Immediate Actions<br>Root Cause Analysis<br>Near Term Actions | Mike Krupa<br>Operations Manager |
| Longer Term Actions | Early Ewing<br>Training Manager |
| Conclusion | Joel Dimmette<br>General Manager<br>Plant Operations |

# OPENING REMARKS

JOEL DIMMETTE
General Manager
Plant Operations

# Operator Performance

- Safe and Reliable Plant Operation is Demonstrated by:
  - Day to day Performance
  - Off-normal event Performance

- Simulator Performance of EOPs

# Day -to -Day Performance

- Sustained Good Performance has been Demonstrated and Observed

# Off-normal Events Performance

- Conservative Decision Making
- Reliable Performance
- Prompt Response

# Simulator Performance

- Simulator Scenarios Surface Declining Performance First:
  - Take Plant Well Beyond Design Basis.
  - Have a Very Low Probability of Occurrence.
  - Often Require Rapid Diagnosis with a Very Compressed Time Line.

# Immediate Actions

- Removed Failures from Licensed Duties Immediately until Individuals Remediated and Reevaluated
- Administered an EOP Knowledge Exam
- Evaluate all Crews in each Training Module in 1996
- Re-evaluated Crew Changes
- Developed Comprehensive Plan
  - Extra EOP Implementation Training
  - Root Cause Team
  - Independent Assessment Team
  - INPO Simulator Assist
  - Follow-up Assessment in Early 1997

# Root Cause Team
## (Internal)

- Mission: Determine the Cause of Recent Simulator Failures
- Makeup: Present and Former RBS Operators and Training Representatives
- Methodology: Extensive Interviewing and Failure Review

# Independent Assessment Team

- Mission: Validate the Root Cause and Provide Additional Insights for Improving Operator Simulator Training
- Makeup: Independent with Extensive Expertise.
- Methodology: Interviews and Training Observations

# Root Cause

- Ineffective Operator Simulator Training Associated with:
  - Lack of Personal and Management Accountability
  - Inadequate Operations Ownership of Training
  - Lack of Sufficient Training Scope, Focus, Depth and Appropriate Standards and Expectations

# Contributing Causes

- Reduced Simulator Time:
  - 2nd Week Added Between Modules (1/95)
  - 2 Annual Exams in 1995
  - Refueling Outage (12 weeks)
  - Training Department Outage (10 weeks)
- Reorganized Crews Post RF6

# Near Term Actions

- Increase Floor Simulator Instructors
- Ensure Standards and Expectations are Clear and Consistent:
  - For Instructors
  - Among Crews
  - Between Plant and Simulator
- Improve Shift Superintendent Effectiveness by Redefining Roles of the Shift Technical Advisor (STA) and Shift Superintendents

# Near Term Actions

**(cont.)**

- Validate EOP Implementing Philosophy
- Revitalize Crew Lead Concept
- Continue to Provide Increased Simulator Time

# Summary

- Goal is Superior Performance
- Declining Performance was Identified
- Thorough Reviews and Corrective Actions are being Implemented to Resolve Operator Performance Issues
- The Ability to Operate the Plant Safely is not Affected.

# Longer Term Actions

- Simulator Improvements
- Training Quality Improvements
- Management Oversight Improvements
- Project Team

# Simulator Improvements

- Use the INPO Simulator Assist Visit to Evaluate Progress
- Improve Simulator Environment (Ceiling, Phones, Physical Arrangement ...)
- Improve Video Capabilities
- Relocate and Improve Simulator Instructor Console

# Training Quality Improvements

- Optimize Use of Rotational Instructor Assignments
- Provide Direct Training on:
  - Facilitative Critiquing
  - Command and Control
  - Observation skills
- Schedule Adequate Instructor Preparation Time

# Training Quality Improvements

**(cont.)**

- Periodically Schedule Outside Coaches to Reinforce Behaviors of Instructors
- Arrange Visits to Other Sites for Operators and Instructors
- Revise Scenarios and Training as Necessary Following Review of EOP Philosophies

# Management Oversight Improvements

- Improve Trending of Individual and Crew Performance
  - Simulator
  - Classroom
  - Plant
- Develop an Integrated Operations/Training Strategic Plan
- Further Reviews and Assessments

# Conclusions

- Safe Plant Operation
- Aggressive Actions
- Continuous Monitoring
- EOI's commitment to accept nothing less than superior performance.