

APPENDIX

U.S. NUCLEAR REGULATORY COMMISSION
REGION IV

Inspection Report: 50-498/93-41
50-499/93-41

Licenses: NPF-76
NPF-80

Licensee: Houston Lighting & Power Company
P.O. Box 1700
Houston, Texas

Facility Name: South Texas Project Electric Generating Station, Units 1 and 2

Inspection At: South Texas Project Electric Generating Station

Inspection Conducted: November 28 through December 3, 1993

Inspector: J. I. Tapia, Reactor Engineer/Examiner, Operations Section
Division of Reactor Safety

Approved: John L. Pellet
John L. Pellet, Chief, Operations Section,
Division of Reactor Safety

12/15/93
Date

Inspection Summary

Areas Inspected (Units 1 and 2): Routine, announced inspection of open items summarized in Inspection Report 50-498/93-40; 50-499/93-40 and of the licensee's corrective action to resolve operations staffing issues (Restart Issue No. 6).

Results (Units 1 and 2):

- The inspector found that the licensee's corrective actions have been effective in correcting the problems which existed as a result of inadequate operator staffing.
- As a result of observation of plant and control room activities, the inspector noted improvement in communications practices and in the reduction of control room crew workload.
- Control room personnel response to an inadvertent loss of a 480 volt motor control center was observed to be very good.
- Six of the eight open items were closed by this report. The remaining

open items will be addressed by the resident inspector staff after full implementation occurs on January 1, 1994. These two open items are sufficiently implemented to consider the restart issue resolved.

- A review of the recent operator requalification training course content indicated increased training resources and additional focus on reactor startup, response to shutdown LOCA, and training on modifications made during the outage.

Summary of Inspection Findings:

- Inspector Followup Items 498;499/9331-01 (Section 2.1), 498;499/9331-03 (Section 2.1), and 498;499/9331-73 (Section 2.1) were closed.
- Inspector Followup Item 498;499/9331-56 (Section 2.3) was closed.
- Inspector Followup Item 498;499/9331-57 (Section 2.2), and 498;499/9116-02 (Section 2.2) were reviewed and remain open.
- Inspector Followup Items 498;499/9331-59 (Section 2.2), and 498;499/9331-66 (Section 2.2) were closed.
- Inspector Followup Item 498;499/9331-65 (Section 2.2) was closed.

Attachments:

- Attachment - Persons Contacted and Exit Meeting

DETAILS

1 BACKGROUND

During this inspection period, Unit 2 remained shut down and defueled. Unit 1 was in Mode 5 and in the process of receiving ongoing Train A maintenance.

NRC Inspection Report 50-498/93-31;50-499/93-31, issued on October 15, 1993, identified 16 restart issues that required resolution prior to the restart of Unit 1. Included in these restart issues were a number of related items from multiple sources, including the Diagnostic Evaluation Team (DET) Inspection conducted March 29 through April 30, 1993, by the NRC Office for Analysis and Evaluation of Operational Data. Restart Issue No. 6 concerned the adequacy of operations staffing.

Seventeen violations, IFIs or licensee event reports were identified in Inspection Report 50-498/93-31;50-499/93-31 as applicable to Restart Issue No. 6. Inspection Report 50-498/93-40;50-499/93-40 previously addressed this Restart Issue and served to close all but seven IFIs. The remaining seven IFIs were left open pending review of the implementation of selected corrective actions. The purpose of this inspection was to determine the licensee's status and effectiveness in resolving the open IFIs related to Restart Issue No. 6.

2 EVALUATION OF CONTROL ROOM WORKLOAD REDUCTION (71715,92701)

The DET confirmed previously identified issues relating to excessive workload and less than adequate staffing in the control room. The DET found that the assigned workload and poor site support adversely impacted the capability of the shift supervisor and the control room staff to effectively maintain the proper focus and overview of plant operations to safely operate the plant.

The inspector performed observations in the control room and in the plant to determine if recently implemented corrective actions have been successful in resolving the issue. In addition, the inspector conducted interviews with selected personnel to gain their perspective on the resolution of the issue.

2.1 Work Control Burden

The licensee established an operations work control group (OWCG) to reduce the administrative workload associated with the work control process on both the unit and shift supervisors. The OWCG was staffed and functioning in accordance with General Revision No. 7 to Procedure OPGP03-ZA-0090, "Work Process Program." The OWCG was staffed in Unit 1 with a OWCG supervisor, who was a licensed senior reactor operator (SRO); three work start supervisors, also SROs; and two work control operators, one a licensed reactor operator (RO) and the other a contractor. The OWCG also included representatives from scheduling, planning and maintenance. The OWCG was physically located outside the control room and was responsible for the following activities previously performed in the control room: evaluating incoming service requests for

operability impacts and safety concerns, developing and authorizing equipment clearance orders (ECOs), specifying and coordinating operability tests prior to returning Technical Specification equipment to operation, and coordinating post-modification and post-maintenance testing. The OWCG was also responsible for approving the integrated schedule and reviewing and prioritizing forced outage work lists.

The inspector determined by observation that the OWCG was being very effective in reducing the administrative burden on the shift and unit supervisors. Discussions with an on-duty shift supervisor disclosed that, prior to the establishment of the OWCG, he previously spent about half of his on-shift time performing those functions now being performed by OWCG personnel. The inspector observed an SRO work start authority and an RO ECO originator in the performance of their OWCG duties. The observed activities were a significant improvement over past practices of having the on-shift unit and shift supervisors perform the associated work control activities. The licensee was also in the process of man-loading the work schedule for all operating crews. This effort will serve to assure that all required work and surveillances were identified and that available staffing was available to support the schedule. One additional item that has been effected to reduce the burden in the control room was the issuance of a memorandum to site personnel requesting that telephone calls and visits to the control room be limited and directing personnel to other sources for information previously obtained from the duty shift supervisor. The inspector noted a marked reduction in telephonic communications directed to the shift supervisor and in the number of personnel entering the control room.

2.2 Staffing

The licensee has developed an operator staffing action plan to achieve short and long term improvements in operations staffing. The operations department has developed a long range organizational structure composed of on-shift and operations support staffing. This structure was being used as a baseline for long range pipeline staffing and training. In the short term, the operations department was transitioning to a six crew rotating schedule on each unit. A fully staffed sixth crew was established on November 1, 1993. During this inspection, this crew was being used to support resource intensive outage activities. As a result of earlier decisions in the year to compress the training schedule, licensed operator requalification training for the remainder of 1993 was fixed to a five week cycle. Therefore, for the remainder of 1993, the operating crews will continue with a five week rotation.

The sixth crew will primarily be used as relief for absences on the five rotating crews after January 1, 1994. The inspector reviewed the on-shift staffing schedule for 1994 and determined that the proposed staffing levels were consistent with providing a reduction in the overtime hours worked during power operations and outages, and with ensuring adequate resources for each on-shift crew. Available staff had recently been augmented with the addition of four RO and eight SRO licenses in October of this year. In addition, the

licensee determined that 20 additional non-licensed operators were needed to support placing five on each shift as opposed to the previous three to four per shift. Ten new non-licensed operators were on shift during this inspection. The additional ten were in the process of completing required training which was expected to be completed on January 24, 1994. The licensee has also effected a reduction in the workload of non-licensed operators by transferring ownership of certain duties to the technical services department. Six systems or tasks have been transferred from plant operations to chemical operations and two have been transferred to chemical analysis.

An additional element which provides support to the control room personnel was the availability of engineering assistance. Technical support engineering (TSE) organization was now providing around-the-clock engineering support to the plant operations and maintenance departments. The on-shift TSE staff have direct access to design engineering and other components of the engineering organization on an as-needed basis throughout the startup of both Units.

As a result of these initiatives, there has been a reduction overtime worked within the operations department. However, the reduction has not been as large as was anticipated when both units were no longer in an outage. The additional personnel in place was noted to have alleviated constraints to effective focusing on plant operations which was noted in the past.

2.3 Unitization

In an additional effort to streamline the work control process and improve the focus of operations and maintenance, the licensee instituted a new organizational structure which unitized the nuclear generation department, with most line employees from craft workers to the plant manager having been assigned to a particular unit. Unitization has not been applied to specific maintenance disciplines such as diesel maintenance crews, certain I&C activities, and electrical personnel maintaining ECW systems. The inspector reviewed the functioning of this unitization and the allocation of department resources in both the Operations and Maintenance Departments.

Of particular note was the adoption in the maintenance department of individual work crews with two supervisors who alternate providing supervision in the field every other week. The concept was to have one supervisor totally focused on the job in the field while the other was preparing for work scheduled for the next week. The number of first line supervisors has almost doubled since adoption of this concept. This will serve to eliminate problems with lack of first line supervision which plagued the maintenance department in the past. A maintenance support group was also established to provide for more focus by craft personnel. The maintenance department has been authorized increased staffing in the 1994 budget and this was expected to result in a reduction on the reliance on contractors. An apprentice class was currently ongoing in the mechanical and electrical disciplines and additional classes were scheduled to start in July 1994, in the I&C and mechanical disciplines.

From observations, the inspector noted that unitization was providing improved focus and ownership and that the new organization reduced the reporting chain and facilitated better communication.

2.4 Observation of Transient

During the performance of control room observations, the inspector observed the Unit 1 operating crew response to an inadvertent loss of a 480V Class 1E motor control center (MCC). An electrician was in the process of installing insulating boots in a spare cubicle in MCC E1A2 when he lost his balance and placed his hand on the feeder breaker trip switch. The loss of power to the MCC resulted in several control room annunciators and half of the control room lighting de-energizing. Since the "A" train was already in a maintenance outage, the loss of power did not adversely affect the reactor plant. Control room personnel responded by dispatching non-licensed operators to the "A" train switchgear room and by referencing the appropriate loss of power procedures. The load listing for MCC E1A2 was referenced prior to restoration of power and discussions were held to verify that the restoration of power did not pose any negative repercussions. The command and control of personnel by the unit supervisor during the transient was very good. The shift supervisor took an overview role and verified that all aspects of the transient were being considered. The inspector determined that there was good response and oversight by control room operators in response to this minor transient.

2.5 Training

Continuous requalification training for licensed operators and non-licensed operators was previously suspended during past outages. The inspector reviewed recently conducted licensed operator requalification schedule and course contents to verify that the licensee has appropriately compensated for previous breaks in the training process. The inspector's review disclosed that the required training will be accomplished by the end of the year and that the course content includes performance of reactor startups, response to shutdown LOCAs, selected system failures, reactivity control, and training on modifications accomplished during outages. Restart training also included management expectations and procedure changes. The inspector noted that individual hours of training received by individual was not being readily tracked. Missed training was being reported to the plant manager; however, this did not provide for identification of the number of hours received by each individual. The licensee acknowledged this observation and planned to subsequently review this matter. The inspector also noted that training resources have increased to support the corresponding increase in operator staffing.

3 STATUS OF ITEMS RELATED TO RESTART ISSUES

The inspector reviewed the licensee's actions to address the following inspector followup items (IFI) related to Restart Issue No. 6.

3.1 (Closed) Inspector Followup Item 498:499/9331-01: Workload and Poor Site Support Adversely Impacted the Capability of the Shift Supervisor and Control Room Staff

The licensee's satisfactory response in addressing this IFI was noted in paragraph 2.1. The inspector verified the resolution of this issue by observation of work activities in the control room and by following work control activities in the newly formed organization.

3.2 (Closed) Inspector Followup Item 498:499/9331-03: The Shift Supervisors and Their Control Room Staff Could Not Effectively Maintain the Proper Focus and Overview of Plant Operations

The licensee's satisfactory response in addressing this IFI was noted in paragraph 2.1. The inspector verified the resolution of this issue by observation of activities in the control room. A minor transient observed by the inspector served to demonstrate the effectiveness of implemented corrective actions.

3.3 (Closed) Inspector Followup Item 498:499/9331-56: Unitize the Operations and Maintenance Organizations to Provide More Organizational Focus and to Shorten Communication Chains

This IFI was previously closed with respect to the operations staffing issue. The licensee's satisfactory response in completely addressing this issue was noted in paragraph 2.3.

3.4 (Open) Inspector Followup Item 498:499/9331-57: A Six-crew Operating Schedule Will be Implemented

The licensee has implemented a sixth crew and has generated a schedule to begin rotating this crew after January 1, 1994. This issue was resolved but remains open to allow the NRC resident inspector staff an opportunity to observe implementation of the rotation. The inspector's review of this issue was noted in paragraph 2.2.

3.5 (Closed) Inspector Followup Items 498:499/9331-59 and 498:499/9331-66: Technical Services Department Will be Assuming the Responsibility for Certain Tasks That are Outside the Protected Area

The licensee's satisfactory response in addressing this IFI was noted in paragraph 2.2. The formal transfer of the associated systems was accomplished during this inspection.

3.6 (Closed) Inspector Followup Item 498:499/9331-65: During the Plant Startup, Engineering Will Provide 24-hour On-shift Support

The licensee's satisfactory response in addressing this IFI was noted in paragraph 2.2. The inspector verified that 24 hour on-shift engineering support was available.

3.7 (Closed) Inspector Followup Item 498;499/9331-73:
Operating Staff Workload and Management's Corrective Actions

The licensee's satisfactory response in addressing this IFI was noted in paragraph 2.1. Management's corrective actions have been effective in resolving this issue.

3.8 (Open) Inspector Followup Item 498;499/9116-02: Operator Overtime Issues

This item will remain open pending NRC resident inspector staff review of the implementation of the sixth crew rotating schedule and its effect on overtime. All elements are in place to allow for an expected reduction of the amount of overtime.

4 ASSESSMENT OF MANAGEMENT'S EFFECTIVENESS IN CORRECTING ISSUE (40500)

The inspector found the implementation of corrective actions for Restart Issue No. 6 effective. The OWCG has significantly reduced the administrative burden on the control room staff. Both operations and maintenance staffs have been augmented and it was expected that once the increased workload associated with the Unit 1 restart was eliminated, a significant reduction in excessive overtime will be realized. The new organizational structure was providing increased focus on work activities and better communications between work groups. The licensee's effectiveness in identifying, pursuing, and correcting the operator staffing problem was considered satisfactory to close this issue.

ATTACHMENT

1 PERSONS CONTACTED

1.1 Licensee Personnel

H. Bergendahl, Manager, Technical Services
B. Bragg, Maintenance Supervisor
H. Butterworth, Operations Manager, Unit 1
T. Cloninger, Vice-President, Nuclear Engineering
W. Cottle, Group Vice-President
M. Coughlin, Sr. Licensing Engineer
W. Dowdy, Operations Manager, Unit 2
J. Fast, Maintenance Manager, Unit 1
J. Groth, Vice-President, Nuclear Generation
J. Gruber, Work Control, Unit 1
S. Head, Sr. Consulting Engineer, Licensing
L. Martin, General Manager, Nuclear Assurance
R. Rehkugler, Manager, Quality Engineering & Materials Testing
K. Richards, Work Control, Unit 2
D. Sanchez, Manager, Nuclear Training Department

1.2 NRC Personnel

D. Loveless, Senior Resident Inspector
T. McKernon, Reactor Inspector
M. Satorius, Project Engineer
R. Vickrey, Reactor Inspector
G. Werner, Resident Inspector

The personnel listed above attended the exit meeting. In addition to the personnel listed above, the inspector contacted other personnel during this inspection period.

2 EXIT MEETING

An exit meeting was conducted on December 3, 1993. During this meeting, the inspector reviewed the scope and findings of the report. The licensee did not express a position on the inspection findings documented in this report. The licensee did not identify as proprietary any information provided to, or reviewed by, the inspector.