APPENDIX

U.S. NUCLEAR REGULATORY COMMISSION
REGION IV

NRC Inspection Report Nos. 50-498/92-09
50-499/92-09

Operating Licenses Nos. NPF-76
NPF-80

Licensee: Houston Lighting & Power Company (HL&P)

Facility Name: South Texas Project Electric Generating Station (STP)

Inspection At: STP, Matagorda County, Texas

Inspection Conducted: April 28-May 1, 1992

Inspectors: Nemen M. Terc, (Team Leader)
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Approved by: for Blaine A. Murray, Chief, Facilities Inspection Programs Section — Date 6/4/92

Inspection Summary

Inspection Conducted April 28 through May 1, 1992 (Report Nos. 50-498/92-09; 50-499/92-09

Areas Inspected: Routine, announced team inspection of the licensee's performance and capabilities during an annual exercise of the emergency plan and procedures. The team observed activities in the control room, the Technical Support Center, the Emergency Operations Facility, and the Operations Support Center. In addition, the inspectors evaluated medical teams, in-plant teams, and security and accountability activities.

Results: Within the areas inspected, no violations or deviations were identified. Generally, the licensee's response during the course of the exercise was adequate to protect the health and safety of the public. Four exercise weaknesses requiring corrective actions were identified by the team. A summary of the licensee's performance of the areas evaluated by the inspection team are summarized below:

- The Control Room staff performance was good. Minor problems were encountered with simulator fidelity and with the real time response of the simulator.

- The actions taken by the technical support staffs were effective to support the Control Room in their efforts to attenuate accident consequences. Emergency coordination and direction were very good, and classification of emergencies was accurate and timely. One weaknesses was identified pertaining to inadequacies identified in the notification process used to notify offsite authorities.

- The Emergency Operations Facility staff performed well during the exercise. Frequent comparison and readjustment of Emergency Operations Facility and Technical Support Center priorities was effective in optimizing mitigating actions. One weakness was identified in the written procedure requiring decisionmakers to get concurrence from state authorities prior to issuing protective recommendations. This weakness could result in a delay in taking protective actions.

- The emergency medical team established proper radiological controls during the medical scenario. The team made general and local radiation and contamination surveys, established boundaries, and took precautions to prevent the spread of contamination. One weakness was identified because poor medical treatment practice and precautions were observed.

- The actions taken by the Operations Support Center to support in-plant teams and to protect radiation workers while they accomplished their tasks were observed and determined to be effective.

- Accountability of onsite personnel was carried out in a timely manner. However, a weakness was identified because during the evacuation a number of workers were directed inadvertently in the direction of the plume, thereby exposing them to radiation.

- The licensee used substantial resources to evaluate the exercise and identified some of the important findings. The overall rating by the inspectors of the licensee's critique was satisfactory.

DETAILS

1. PERSONS CONTACTED

HL&P

*W. Jump, Manager, Nuclear Licensing
*M. Covell, Manager, Emergency Response
*R. Chewing, Vice President, Nuclear Support
*D. Leazar, Manager, Plant Engineering
*W. Kinsey, Vice President, Nuclear Generation
*S. Rosen, Vice President, Nuclear Engineering
*D. Hall, Group Vice President, Nuclear
*G. Midkiff, Manager, Plant Operations
*C. Walker, Manager, Public Information
*D. Denver, Manager, Nuclear Engineering
*R. Hernandez, Manager, Design Engineering
*R. Balcom, Manager, Nuclear Security
*P. Appleby, Manager, Training
*M. Weisenberg, Plant Manager
*T. Jordan, General Manager, Nuclear Assurance
*G. Parkey, Manager, Planning and Assessment

NRC

*A. Howell, Chief, Reactor Projects Section D
*J. Tapia, Senior Resident Inspector
*R. Evans, Resident Inspector

The inspection team also held discussions with other station and corporate personnel in the areas of security, health physics, operations, training, and emergency response.

*Denotes those present at the exit interview.

2. FOLLOWUP ON PREVIOUS INSPECTION FINDINGS (92701)

(Closed) Exercise Weakness (498/9120-01; 499/9120-01): This weakness was identified during the 1991 exercise. It resulted from the failure by the Control Room staff to detect and classify an alert condition. During the 1992 exercise, the inspectors noted that event classifications in the Control Room were performed correctly and in a timely manner.

(Closed) Exercise Weakness (498/9120-02; 499/9120-02): This weakness was identified during the 1991 exercise. On certain occasions, the staff in the Technical Support Center was unable to perform proper data verification by pursuing alternate sources of information aggressively. In addition, the analysis of system hydraulics was poor. During the 1992 exercise, no significant problems were noted with Technical Support Center data verification or analysis of plant thermal hydraulic data.

(Closed) Exercise Weakness (498/9120-03; 499/9120-03): This weakness was identified during the 1991 exercise. The inspectors noted that on occasion the technical support staff did not have a correct understanding of the accident and provided incorrect information during the initial briefing of the incoming NRC response team. Additionally, some message notification forms used to communicate events to offsite authorities were either incomplete or incorrect. During the 1992 exercise, none of the above problems were identified.

(Closed) Exercise Weakness (498/9120-04; 499/9120-04): This weakness was identified during the 1991 exercise. The inspectors noted that radiological controls exercised during the medical scenario were poor. During the 1992 exercise, the inspectors verified that radiological controls were adequate during the medical scenario involving a contaminated injured person. The medical response team made general area and local radiation and contamination surveys, established radiation and contamination barriers, and took precautions to prevent the spread of contamination.

3. PROGRAM AREAS INSPECTED

The licensee's 1992 annual emergency exercise began at 7:30 a.m. on April 29, 1992. The exercise involved participation by the state of Texas. An NRC emergency response team participated in the exercise.

The inspection team observed licensee activities in the Control Room, Technical Support Center, Operations Support Center, and Emergency Operations Facility during the exercise. The team evaluated the licensee's implementation of the emergency plan and procedures including emergency response organization staffing; emergency response facility activation; detection, classification, and notification of emergencies; technical assessment; emergency communications; dose assessment; and formulation of protective action recommendations. In addition, the inspectors evaluated in-plant medical teams, corrective action teams, and security and accountability activities. Inspection findings are documented in the following paragraphs.

The exercise scenario events centered in Unit 1. Several simulated malfunctions occurred: a large loss of coolant from the reactor coolant system, reactor core damage, and a leak of radioactive material through a supplemental purge exhaust into the unit ventilation exhaust system. These failures resulted in a general emergency condition that would have required the evacuation of areas within the emergency planning zone. Additionally, the exercise scenario included a contaminated injured person who had to be transported to a medical facility offsite.

The inspectors identified various concerns during the course of the exercise; however, none were "significant" as defined in 10 CFR 50.54(s)(2)(ii).

Each of the observed concerns has been characterized as an exercise weakness according to 10 CFR Part 50, Appendix E.IV.F.5. An exercise weakness is a finding that a licensee's demonstrated level of preparedness could have

precluded effective implementation of the emergency preparedness plan in the event of an actual emergency. It is a finding that requires licensee corrective action.

4. CONTROL ROOM (82301)

The inspection team observed and evaluated the Control Room staff as they performed tasks in response to the exercise. These tasks included detection and classification of events, analysis of plant conditions, implementation of corrective measures, notifications of offsite authorities, and adherence to the emergency plan and implementing procedures.

The plant specific simulator was used to initiate the exercise. However, once the exercise proceeded beyond the actuation of a reactor trip, minor failures forced Control Room operators to seek controller guidance. For example, containment pressure and reactor plenum levels were incorrect and on one occasion, a diesel generator could not be secured because the simulator would not allow it. Minor failures in the functioning of the simulator compelled controllers to use previously prepared data sheets and verbal guidance to provide plant status. In this manner, Control Room operators were able to develop appropriate strategies. The reactor operators also encountered problems with the operation of the simulator. On two occasions attempts to start a diesel generator were unsuccessful because the simulator was not reset in a timely manner after it was announced that a related breaker had been racked out. The licensee indicated to the inspectors that it has plans to upgrade the simulator significantly.

The performance of the Control Room staff was observed to be good during the exercise. Actions in response to plant activity were aggressive and led to responses which occurred earlier than anticipated in the timeline. Procedures were followed consistently and information flow between the Control Room and other emergency response facilities and within the Control Room were satisfactory.

Conclusion

The Control Room staff performance was good. Minor problems were encountered with simulator fidelity and with the real time response of the simulator.

5. TECHNICAL SUPPORT CENTER (82301)

The inspectors observed and evaluated the Technical Support Center staff throughout the exercise as they performed tasks in response to the simulated accident conditions of the scenario. The inspectors evaluated staffing; command and control; technical assessment and support to operations; detection, classification, and notifications; dose assessment; formulation of protective action recommendations; and adherence to the emergency plan and implementing procedures.

The inspectors noted that the staff performed well during the exercise. Examples of good performance in the Technical Support Center included

effective and timely management briefings. Information flow was efficient in both vertical and horizontal directions of the organizational tree.

The inspectors noted that communicators in the Technical Support Center erroneously logged the time of initial contact with offsite authorities as the message delivery time and that the actual completion time exceeded the 15 minute requirement. Logging the time of initial contact instead of the actual delivery time is not in accordance with the intent of 10 CFR Part 50, Appendix E.IV.D. For the notification to be effective, the complete message must be delivered, that is, the license must be able to communicate all the information required by the initial notification form that has been agreed to beforehand by both the state and the licensee. According to a statement made by the communicator, the licensee's practice of logging the time of the initial contact is a consequence of the elaborate content of the message. The inspectors noted that further delay results from questions by state officials on the details contained in the notification message.

The practice of logging the initial contact with offsite authorities as the message delivery time was not consistent with Procedure OERP01-ZV-IN02, "Notification to Offsite Agencies," Revision 0, paragraphs 4.1 and 5.2, which specifically states that all notifications to offsite agencies must be completed within 15 minutes.

In addition, the inspectors noted that the initial notification message for the site area emergency incorrectly stated that there was a potential loss of containment when accident conditions did not justify this statement. If conditions had indicated a potential loss of containment at that time, the appropriate classification should have been changed to a general emergency.

The above two inadequacies in notifying offsite agencies constitute an exercise weakness (498/9209-01; 499/9209-01).

No violations or deviations were identified.

Conclusion

The actions taken by the technical support staff were effective to support the Control Room in their efforts to attenuate accident consequences. Emergency coordination and direction were very good, and the classification of emergencies was accurate and timely. Two weakness were identified. One weakness is independent of exercise scenario and pertains to an omission in the classification pr . The other weakness involves inadequacies identified in the notifi ion process used to notify offsite authorities.

6. EMERGENCY OPERATIONS FACILITY (82301)

The inspectors observed and evaluated the Emergency Operations Facility staff as they performed tasks in response to the exercise. These tasks included activation of the Emergency Operations Facility, accident assessment and classification, offsite dose assessment, notifications, protective action

decisionmaking, preparations for entering the recovery phase, and interaction with state and local officials.

The Emergency Operations Facility staff performed well during the exercise. Frequent comparison and readjustment of Emergency Operations Facility and Technical Support Center priorities were effective in optimizing mitigating actions. Briefings by the Emergency Director were frequent and detailed. The noise level in the Emergency Operations Facility was maintained at a reasonable level throughout the exercise. With few exceptions, plant status and data were reflected accurately on the Emergency Operations Facility status boards. Record keeping functions, including a chronology of actions, were recorded properly on formal emergency action logs.

The Emergency Director did not make his 10:34 a.m. protective actions recommendation to evacuate parts of the emergency action zone contingent on the concurrence of the state of Texas as required by Procedure OPGP03-ZA-002, "Offsite Protective Action Recommendations." Despite this, the inspection team considered the Emergency Director's actions to be appropriate. The team considered that procedural demands made on licensee decisionmakers to obtain concurrence from offsite authorities prior to making protective action recommendations to be generally inappropriate because of the potential to delay protective actions taken in behalf of the public. Compulsory concurrence by the state may occasionally be difficult or impossible to obtain in a timely manner. The licensee, in addition to regulatory requirements to make timely recommendations, is best qualified to make decisions based on plant conditions, measured release rates and dose projections status and, consequently, to make optimum recommendations based on that knowledge. In practice, discussions with the state could follow initial recommendations, and changes to the initial recommendations could be evaluated at that time. In addition, Procedure OPGP03-ZA-002 does not provide guidance on what to do if the state decides not to concur with the licensee protective action recommendations.

The procedural requirement to obtain concurrence from offsite authorities prior to making protective action recommendations and the lack of guidance as to what to do if this concurrence is not obtained constitutes an exercise weakness (498/9209-03; 499/9209-03).

Conclusion

The Emergency Operations Facility staff performed well during the exercise. Frequent comparison and readjustment of Emergency Operations Facility and Technical Support Center priorities were effective in optimizing mitigating actions. One weakness was identified in the written procedure requiring decisionmakers to get concurrence from state authorities prior to issuing protective recommendations. This could delay protective actions.

7. OPERATIONS SUPPORT CENTER (82301)

The inspectors evaluated the performance of the Operations Support Center staff as they performed tasks in response to the exercise to determine whether

the Operations Support Center would be effective in providing support to operations.

The Operations Support Center was staffed and activated quickly and became fully functional well within the 1-hour guideline given by written procedures. The Operations Support Center had a staffing chart where responding personnel signed in, showing at a glance the stages of readiness and staffing.

The Operations Support Center coordinator used written checklists, established communications with the technical support center, and performed habitability surveys. The person in charge of the center was thorough in his briefings to the staff and used the assistance of the health physics manager for briefings. Throughout the exercise, emergency response teams were briefed effectively by maintenance personnel; the briefings covered logistics requirements and radiological precautions. In-plant teams were tracked effectively using status boards. Twenty in-plant teams were used during the exercise, and many of these teams were tracked simultaneously.

No violations or deviations were identified.

Conclusion

The actions taken by the Operations Support Center to support in-plant teams, and to protect radiation workers while they accomplished their tasks were found to be effective.

8. SECURITY/ACCOUNTABILITY (82301)

The inspection team observed and evaluated the security staff response to the exercise. The tasks included personnel accountability during and after site evacuation, access control, and evacuation of the owner-controlled area.

The emergency director in the Technical Support Center declared a site area emergency at 9:39 a.m. The site evacuation alarm was sounded at 9:46 a.m. At 10:13 a.m., 34 minutes after the declaration of the site area emergency and 28 minutes after the sounding of the site evacuation alarm, 5 persons were identified as missing. At 10:21 a.m., 42 minutes after the declaration of the site area emergency and 35 minutes after sounding the evacuation alarm, all missing persons were located. Based on these facts, the inspectors concluded that personnel accountability was performed within the time guidelines of NUREG 0654.

The evacuation of the owner-control area resulted in the evacuation of some personnel directly into the path of the plume. During the evacuation, the plume was traveling north from the plant. Some personnel from the plant support building were told to evacuate around the south side of the plant and to proceed away from the plant to the west. Other personnel from the same building were given maps which had instructions to evacuate using an access road which ran north away from the plant. During the 1992 exercise, the evacuation of personnel toward the north resulted in radiation exposure and contamination of personnel.

A similar weakness was identified in this area during the 1991 exercise. During the 1991 exercise, public announcements for evacuating unessential personnel during the site area emergency and during site evacuation did not include descriptions of plant status or existing radiological conditions. At that time, according to the 1991 exercise scenario, a radioactive plume affected certain areas within the site boundary. Evacuees could have walked right into the radioactive cloud. The 1991 exercise weakness was compounded by poor frisking requirements prior to entering the technical support center. This had the potential of cross contaminating the technical support center as emergency responders transversed the plume and then entered the facility.

It should be noted that the licensee identified the 1992 weakness during their self-critique and later, on June 2, 1992, reported to the inspection team leader that they had identified the root causes for this exercise weakness. The licensee stated that the two incidents were a result of poor coordination between the radiological protection manager in the technical support center and the security manager directing evacuees. The licensee is revising procedures and conducting additional training of responders as a response to this item.

The inspectors concluded that the lack of a method for properly coordinating evacuees allowing them to be exposed to radioactive hazards during site evacuation constitutes an exercise weakness (498/9209-04; 499/9209-04).

Conclusion

Accountability of onsite personnel was carried out in a timely manner. However, a weakness was identified because during the evacuation a number of workers were directed inadvertently in the direction of the plume exposing them to radiation.

9. EMERGENCY MEDICAL SERVICES (82301)

The inspectors observed the performance of a licensee medical team in a medical scenario involving a contaminated injured person. In accordance with the medical scenario, a chemical technician attempting to obtain a reactor coolant water sample became injured and contaminated. Simulated injuries included a compound fracture of one arm with exposed bone and trauma to head (a bleeding cut).

The emergency team determined dose rates and contamination levels quickly and effectively established contamination boundaries and frisker locations. Gross swipes were used to bound contamination levels.

However, several instances of improper medical treatment were noted as follows:

- The first responder, a health physics technician, did not check the victim's respiration rate, pulse, and did not examine the victim closely for wounds. He missed initially the arm wound and the sign of shock.

- The first responder left the victim unattended for about 3 minutes to look for the source of radiation, even though he had confirmed that the general area radiation in the "hot lab" was only 3.5 mrem/hour.

- The medical emergency team did not arrive at the scene for about 10 minutes after the injury was reported to the Control Room.

- The emergency medical team identified the arm injury with exposed bone at 8:24 a.m. However, they did not apply a bandage to the wound until 8:34 a.m., that is 10 minutes later.

- The pressure bandage was applied loosely and would not have stopped the arm from bleeding.

- A pressure bandage was not applied to the head wound until 8:48 a.m., 24 minutes after the emergency medical team arrived at the scene.

- The victim received no shock treatment until he was laid down on the backboard and wrapped in a blanket at 8:57 a.m., 33 minutes after the emergency medical team reached the victim.

- The victim was slumped down unconscious in a chair with his head on the back of the chair when the emergency medical team attempted to slip the victim out of his lab coat instead of cutting it off. This movement caused further damage to his injured arm. Later, the emergency medical team became aware of this and cut off his lab coat.

The inadequacies identified in handling an injured person constitute an exercise weakness (498/9209-05; 499/9909-05).

Conclusion

The emergency medical team properly established radiological controls during the medical scenario. The team made general and local radiation and contamination surveys, established boundaries, and took precautions to prevent the spread of contamination. One weakness was identified (poor medical treatment and precautions).

10. LICENSEE SELF-CRITIQUE

The inspectors observed and evaluated the licensee's self-critique for the exercise and determined that the process of self-critique involved adequate staffing, resources, and the participation of higher management. The inspectors noted that the licensee involved substantial resources to identify properly and characterize exercise weaknesses and that some of their findings coincided with findings by the inspectors.

The inspectors noted, however, that on the whole, the critique identified some important findings such as the radiation exposure to workers exposed to the radioactive plume during the site evacuation, the delay in notifying offsite

authorities, and the poor coordination of first aid activities. The inspectors concluded that the licensee's critique was adequate. However, their critique of the medical scenario did not identify the delayed and improper treatment of the victim which could have caused additional injury. Also, the licensee's description of identified weaknesses was not detailed sufficiently to characterize properly the various aspects of each of their findings.

No violations or deviations were identified.

Conclusion

The licensee used substantial resources to evaluate the exercise and identified some of the important findings. The overall rating by the inspectors of the licensee's critique was satisfactory.

11. EXIT INTERVIEW

The inspection team met with the licensee representatives indicated in paragraph 1 on May 1, 1992, and summarized the scope and findings of the inspection as presented in this report. The licensee acknowledged their understanding of weaknesses and agreed to examine them to find root causes in order to take adequate corrective measures. The licensee did not identify as proprietary any of the materials provided, or reviewed by, the inspectors during the inspection.