ENCLOSURE

U.S. NUCLEAR REGULATORY COMMISSION
REGION IV

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Report No.:	50-498/98-13 50-499/98-13
Licensee:	STP Nuclear Operating Company
Facility:	South Texas Project Electric Generating Station, Units 1 and 2
Location:	FM 521 - 8 miles west of Wadsworth Wadsworth, Texas
Dates:	August 4-7, 1998
Inspector(s):	Gail M. Good, Senior Emergency Preparedness Analyst, Team Leader David P. Loveless, Senior Resident Inspector Gilbert L. Guerra, Jr., Resident Inspector Larry T. Ricketson, Senior Radiation Specialist
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Attachment:	Supplemental Information

EXECUTIVE SUMMARY

South Texas Project Electric Generating Station, Units 1 and 2
NRC Inspection Report 50-498/98-13; 50-499/98-13

A routine, announced inspection of the licensee's performance and capabilities during the full-scale, biennial exercise of the emergency plan and implementing procedures was performed. The inspection team observed activities in the control room simulator, technical support center, operations support center, and emergency operations facility.

Plant Support

- Overall, performance was good. The control room (CR), technical support center (TSC), operations support center (OSC), and emergency operations facility (EOF) successfully implemented most essential emergency plan functions including classification, notification, assembly and accountability, and inplant team protection and control.

- The CR staff's performance was generally good. Emergency classifications and corresponding offsite agency notifications were correct and timely. The operations staff followed emergency operating procedures throughout the event and, in general, responded well to plant conditions. However, electrical power was not restored in a timely manner following the loss of offsite power and the station blackout. Communication problems contributed to difficulties in classifying events, and three-part communications were not used consistently. Emergency alignment of the TSC ventilation system was not verified in a timely manner (Section P4.2).

- The TSC staff's performance was very good. Activation was rapid, and command and control responsibilities were transferred in a systematic manner. The site area emergency was quickly recognized and classified. Offsite agency notifications were correct and timely. Frequent and comprehensive briefings were conducted, and center priorities were clearly defined and tracked. Proper radiation protection controls were established for inplant teams, including recommendations for inplant teams to use potassium iodide and respiratory protection. Center habitability was properly monitored. Status boards were detailed, accurate, and updated in a timely manner (Section P4.3).

- The OSC staff's performance was good. The center was activated with appropriate personnel, and it was equipped properly to perform its function. Briefings were concise, informative, and regularly performed. Job priorities were clearly identified. Information sharing was timely and status boards were well maintained. Contamination controls and radiological surveys were not always complete or proper. The fire brigade responded well to the simulated emergency situations, but some members did not perform proper pre-use tests, and one member did not have corrective lens inserts for respiratory protection equipment (Section P4.4).

- The EOF staff's performance was good. Command and control responsibilities were transferred in a systematic manner. The general emergency condition was not

immediately recognized but was classified within a reasonable time frame. Offsite agency notifications were made within regulatory limits. An exercise weakness was identified because the EOF and radiological directors failed to recognize that dose projections indicated a need to make protective action recommendations beyond 10 miles. Facility briefings were comprehensive, and a special effort was made to inform plant personnel of implemented offsite protective actions. At times, field teams were not always effectively controlled: one team was directed to enter the plume twice at the 1-mile point, and there was no coordination with the state to monitor or confirm radiation levels 10 miles downwind. There was good coordination with offsite agency response team personnel (Section P4.5).

- The exercise scenario was challenging and provided an above average vehicle for testing emergency response capabilities. Some aspects of exercise conduct and control, such as, inappropriate evaluator/observer interactions with participants, controllers allowing participants to perform actions out of sequence, and inconsistent/incomplete data detracted from the training value of the exercise (Section P4.6).

- Post-exercise critiques in the TSC, OSC, and EOF were very thorough, open, and self-critical. The post-exercise critique in the CR simulator was superficial and tended to focus on third-party problems. A professional and candid management critique that included offsite agency representatives was conducted. The use of peer evaluators from other sites added depth to the critique process. The integrated critique process was identified as a program strength (Section P4.7).

IV. Plant Support

P4 Staff Knowledge and Performance in Emergency Preparedness

P4.1 Exercise Conduct and Scenario Description (82301 and 82302)

The licensee conducted a full-scale, biennial emergency preparedness exercise on August 5, 1998. The exercise was conducted to test major portions of the onsite (licensee) and offsite emergency response capabilities. The licensee activated its emergency response organization and all emergency response facilities. The Federal Emergency Management Agency evaluated the offsite response capabilities of the State of Texas, Matagorda County, and the Cities of Bay City and Palacios. The Federal Emergency Management Agency will issue a separate report.

The exercise was run using the CR simulator in a dynamic mode. The exercise scenario began at 6:30 a.m. with the plant shutting down and operating at 12 percent power following a 107-day run at 100 percent power. Normal weekday personnel were available for duties. At the beginning of the exercise scenario, reactor chemistry indicated a gradual increase in reactor coolant system total activity to 0.2 microcuries per gram with a 0.1 microcurie per gram dose equivalent iodine. The Unit 2 standby transformer was out of service for maintenance. Additionally, a Train A work week removed essential cooling water, auxiliary feedwater, and Standby Diesel Generator 11 from service. Finally, Emergency Switchgear 1L was tagged out for breaker maintenance.

At 6:42 a.m., the main turbine failed to trip during a turbine overspeed trip test resulting in a catastrophic failure of the low pressure turbine blades. Main Steam Line B suffered a pipe rupture damaging additional turbine building equipment including the main transformer. A fire started under the main generator fed by several severed oil lines spraying oil on hot piping. The reactor tripped and the expected auxiliary feedwater initiation started Pumps 12, 13, and 14.

At 6:43 a.m., a main steam isolation signal was generated as a result of the line break. However, pipe whip from the rupture damaged the Main Steam Isolation Valve 1B operator causing it to bind and remain open.

At 6:50 a.m., the CR received a loose parts monitor alarm at the reactor vessel. However, operators failed to properly respond to or evaluate this alarm, as discussed in Section P4.2 below.

The shift supervisor declared a notification of unusual event at 6:51 a.m., based on the main turbine failure resulting in casing penetration. Shortly thereafter, the shift supervisor declared an alert at 7:11 a.m., based on an erroneous determination that turbine generated missiles had penetrated the isolation valve cubicle (see Section P4.2 below). Scenario developers planned for the alert to be based on AC power capability to three engineered safety features buses reduced to a single power source for greater than 15 minutes.

At 7:26 a.m., the CR received indication that power was lost to the north bus in the main switchyard. Standby Diesel Generator 13 started, but the output breaker failed to close on 4160 volt Vital Bus E1C. Standby Diesel Generator 12 started and ran. However, the sequencer failed to automatically start Train B equipment. Although operators manually started the required Train B equipment, the engineered safety features buses were reduced to a single power source for greater than 15 minutes (the alert condition discussed above).

At 7:40 a.m., while conducting a purge for a primary sample, chemistry technicians reported that radiation levels were increasing rapidly in the hot chemistry room. The technicians were forced to evacuate after obtaining a small sample. Based on low reported dose rates, the CR simulator operators failed to identify the significance of this event (see Section P4.2 below).

The TSC manager, who had assumed command and control duties at 8:03 a.m., declared a site area emergency at 8:16 a.m. when Standby Diesel Generator 12 tripped on generator differential current. This condition resulted in the loss of all onsite and offsite power to all three 4160 volt AC engineered safety features buses for greater than 15 minutes. Assembly and accountability were declared at 8:25 a.m.

At 9:16 a.m., the CR received indications that Steam Generator 1B suffered a tube rupture. A radioactive steam cloud was released from the ruptured steam line. The EOF director, who had assumed command and control duties from the TSC at 8:48 a.m., declared a general emergency at 9:30 a.m. based on the loss of two fission product barriers and the potential loss or loss of the third barrier.

The CR staff responded to additional events and annunciators as required throughout the remainder of the exercise. At 12 noon, repair efforts were successful and Main Steam Line Isolation Valve 1B was closed, stopping the release. The exercise was terminated at 1 p.m.

P4.2 Control Room (CR)

a. Inspection Scope (82301-03.02)

The inspectors observed and evaluated the CR shift staff as they performed tasks in response to the exercise scenario conditions. These tasks included event detection and classification; analysis of plant conditions; offsite agency notifications; adherence to the emergency plan and procedures; and licensed operator command and control, communications, and adherence to procedures. The inspectors reviewed applicable emergency plan sections and procedures, operator logs, checklists, and notification forms.

b. Obs ations and Findings

The CR staff effectively mitigated the effects of the simulated plant and equipment failures. During the exercise, the CR staff quickly recognized ongoing accident conditions. The CR staff appropriately classified the notification of unusual event

based on the main turbine failure resulting in casing penetration. Given that the shift supervisor/emergency director incorrectly interpreted communications from the field, the alert was properly classified, because the emergency director believed that turbine generated missiles had penetrated the isolation valve cubicle. The inspectors concluded that the crew was both cautious and expeditious in classifying the events. Corresponding offsite agency notifications were correct and timely.

Communications in the CR simulator were not always sufficient to fully communicate the issues at hand. The use of three-part communications was inconsistent. Multiple examples of one and two-part communications were observed, particularly during times of high activity. Moreover, the following communications errors complicated the event response:

- Operators failed to communicate a loose parts monitor alarm to other operators. This resulted in the failure to understand the existence of and reason for fuel damage.

- Poor information provided, and an erroneous interpretation and assumption that missiles had entered the isolation valve cubicle, led to an early alert declaration.

- Incomplete and unchallenged communications with chemistry technicians resulted in licensed operators being unaware that fuel damage had occurred and had resulted in high radiation levels in the post-accident sampling system room.

The inspectors also assessed the frequency and quality of CR staff briefings. Although multiple significant activities were taking place, the shift supervisor failed to conduct a CR staff briefing for over an hour after the initiating event. During a briefing conducted at 8:46 a.m., operators' attention was directed to lower priority activities, resulting in a briefing that was neither completed nor effective. As a result, the shift supervisor did not actively solicit recommendations from the crew.

Electrical power was not restored in a timely manner following the loss of offsite power and the station blackout. No clear priorities regarding vital power were delineated in the CR. This delayed assessment of equipment conditions. For example, the failure of Bus E1A was not questioned, and no one was dispatched to determine the cause. Additionally, exercise controllers had to modify the success paths to restore vital power following the station blackout. Long delays in assessing and correcting electrical equipment problems led to a need to correct the simulator scenario. Had the scenario continued as originally designed, the return of electrical power to vital buses would have taken considerably longer.

The inspectors also observed that, after Bus E1C was energized, operators did not continue to pursue restoring power through the emergency transformer as a priority. Switchgear 1L was repaired and available before Standby Diesel Generator 13 was returned to service. However, an attempt to energize Bus E1B from the emergency transformer was not conducted until 46 minutes later. Again, the bus was available

because the exercise scenario was modified. The success path of replacing the blown fuses in Switchgear 1L was never completed.

Finally, the inspectors noted that the TSC ventilation system was not verified to be in the emergency ventilation alignment until 2 hours and 35 minutes after the site area emergency declaration. The verification was required by Step 10.a of the shift supervisor's site area emergency checklist contained in Emergency Response Procedure 0ERP01-ZV-SH01, "Shift Supervisor," Revision 10.

c. Conclusions

The CR staff's performance was generally good. Emergency classifications and corresponding offsite agency notifications were correct and timely. The operations staff followed emergency operating procedures throughout the event and, in general, responded well to plant conditions. However, electrical power was not restored in a timely manner following the loss of offsite power and the station blackout. Communication problems contributed to difficulties in classifying events, and three-part communications were not used consistently. Emergency alignment of the TSC ventilation system was not verified in a timely manner.

P4.3 Technical Support Center (TSC)

a. Inspection Scope (82301-03.03)

The inspectors observed and evaluated the TSC staff as they performed tasks necessary to respond to the exercise scenario conditions. These tasks included staffing and activation, accident assessment, NRC notifications, personnel accountability, facility management and control, internal and external communications, assistance and support to the CR, and prioritization of mitigating actions. The inspectors reviewed applicable emergency plan sections, procedures, checklists, and logs.

b. Observations and Findings

The TSC was rapidly activated following the 7:11 a.m. alert declaration. Staffing was complete within 29 minutes, and command and control duties were transferred to the TSC manager 22 minutes later. The turnover was thorough and accomplished with the use of procedures and checklists. A public address announcement was made when the TSC manager assumed responsibility as the emergency director.

Plant conditions were analyzed and evaluated in a timely manner, including recognizing and classifying the site area emergency. The TSC staff performed well in monitoring key plant parameters. However, the TSC did not pursue efforts to obtain a core damage assessment until late in the exercise. The request to obtain a primary system sample to assess core damage was not made a priority until late in the exercise after the NRC senior resident inspector asked about core damage assessment.

Communications within the TSC were good. Staff communications were clear, and there were frequent manager briefings and frequent public address announcements in the TSC regarding facility priorities and plant status. Briefings were thorough and included input from all functional areas. Priorities were set and reviewed at frequent intervals. Established priorities were communicated to the OSC for proper maintenance repair team dispatch. Status boards were detailed, accurate, and updated in a timely manner. The TSC staff determined appropriate responses to emerging issues and communicated/discussed conclusions with the other emergency response facilities. Offsite agency notifications by the TSC were correct and timely.

With one exception, proper radiation protection practices were implemented. Potassium iodide and respiratory protection were recommended for inplant teams. Radiological controls were established for entry into the TSC, and thermoluminescent dosimeters were issued to the TSC staff. Periodic habitability surveys were conducted. However, the inspectors noted that the portal monitor positioned at the TSC entrance was not source checked prior to use to determine operability. The last operability check was June 25, 1998. Good health physics practices would dictate that portal monitor operability be properly verified via source checks prior to use. The portal monitor was properly checked on a quarterly basis in accordance with plant procedures; however, TSC procedures did not address setting up and source checking the portal monitor prior to use during an emergency. The licensee agreed that a source check should have been performed.

Radiological information flow within the TSC was delayed at times. A communicator provided radiological information to the TSC manager before it was relayed by the radiological manager. The radiological manager was reminded by the TSC manager to provide information as soon as possible and not to wait for management meetings or to be solicited for information.

The licensee used a mock NRC response team. Upon arrival, TSC representatives provided a good status briefing. The response team was introduced via the TSC public address system, and the team's role was explained to the TSC staff to help integrate the team's activities.

c. Conclusions

The TSC staff's performance was very good. Activation was rapid, and command and control responsibilities were transferred in a systematic manner. The site area emergency was quickly recognized and classified. Offsite agency notifications were correct and timely. Frequent and comprehensive briefings were conducted, and center priorities were clearly defined and tracked. Proper radiation protection controls were established for inplant teams, including recommendations for inplant teams to use potassium iodide and respiratory protection. Center habitability was properly monitored. Status boards were detailed, accurate, and updated in a timely manner.

P4.4 Operations Support Center (OSC)

a. Inspection Scope (82301-03.05)

The inspectors observed and evaluated the OSC staff as they performed tasks in response to the exercise scenario conditions. These tasks included fire brigade response, facility staffing, emergency response team dispatch and response to CR and TSC requests. The inspectors reviewed applicable emergency plan sections, procedures, logs, radiological surveys, and forms.

b. Observations and Findings

Prior to OSC activation, the inspectors observed the licensee's response to a fire in the turbine generator building. The fire brigade members responded promptly to the notification. The fire brigade had the proper equipment and protective clothing. The fire brigade leader demonstrated good performance by assigning job responsibilities in a timely manner and frequently asking the responders about symptoms of heat stress. The fire brigade quickly and successfully located and evacuated two injured exercise participants (simulated) and notified the CR of its assessment of turbine generator building conditions.

However, two problems were noted with the fire brigade's actions. First, after donning respiratory face pieces, some members of the fire brigade did not perform a pre-use negative/positive pressure seal test to ensure that self-contained breathing apparatuses were in proper working order. Second, three members of the fire brigade reported to the fire brigade equipment locker wearing eye glasses. Two of the three individuals donned self-contained breathing apparatuses, but only one of the individuals used corrective lens inserts in the respiratory protection equipment. The licensee initiated proper corrective actions to address these issues.

When the inspectors arrived at the OSC, the center was activated with appropriate personnel. The participants names and emergency response function descriptions were properly recorded on information boards within the center. Telephones, radios, and other equipment necessary for the OSC to function were in place. Current lists of resources and personnel were maintained. Habitability surveys in the center were performed regularly.

The OSC coordinator demonstrated very good command and control by effectively communicating plant status and job priorities. OSC briefings were concise and informative. The OSC coordinator conducted the briefings regularly and solicited information from all OSC members with substantive information. Throughout the exercise, information sharing within the OSC was timely and status boards were well maintained. OSC personnel correctly used three-part communications when issuing and responding to directions.

Good emergency team briefings were conducted prior to dispatch from the OSC. Maintenance and radiation protection OSC leads provided teams with the appropriate information so that the teams could properly assess equipment

conditions and perform assigned tasks expeditiously, while maintaining radiation doses low. Sufficient space was available to allow multiple maintenance team briefings to be conducted simultaneously without conflict or interference. Emergency teams were briefed by health physics personnel in accordance with the team assignment priority, when two or more teams were ready for dispatch.

Good communications were maintained between the field teams and the OSC leads. The OSC radiation protection lead informed the field teams when there was a change in radiological or plant equipment conditions. In some cases, assigned teams were not dispatched because the hypothetical radiation levels were too high, and the benefits did not outweigh the risks. Radiation protection personnel assigned to field teams kept the OSC radiation protection lead informed of the radiological conditions in the plant and on traversed routes.

At times, health physics personnel did not implement proper contamination controls or perform proper radiological surveys. The following examples were observed:

- A health physics technician who responded to aid contaminated workers (Team 15) placed a radiation detection instrument and other supplies on a potentially contaminated floor before surveying the area to determine if it was clean. The area was potentially contaminated because contaminated personnel had entered through the same doorway and waited in the area.

- One of the contaminated individuals from Team 15 extended an arm across the clean area barrier when donning paper coveralls in preparation for decontamination. This could have spread contamination to clean areas. Contamination levels on the individuals were relatively significant (50,000 to 70,000 dpm/100 cm^2). Health physics personnel took no immediate action to mitigate the potential spread of contamination.

- Two of three contaminated workers were allowed to use the clean showers instead of the designated decontamination shower. This could have spread radioactive contamination to other workers or resulted in an unmonitored release.

- When the individuals did not report for additional evaluation and decontamination, health physics personnel identified the problem and redirected the individuals to the designated decontamination shower. Although the presence of facial and nasal contamination was identified on the workers, health physics technicians failed to conduct whole-body counting on the individuals to evaluate the radiological hazard resulting from internal radioactive material.

- Health physics personnel also failed to evaluate the radiological hazards caused by airborne radioactivity before teams were allowed to re-enter the isolation valve cubicles and the turbine generator building, later in the exercise. The exercise scenario dictated a loss of electrical power, and battery-powered air samples were not available. Therefore, air samples were

not taken and analyzed to determine airborne radioactivity concentrations prior to personnel entry.

c. Conclusions

The OSC staff's performance was good. The center was activated with appropriate personnel, and it was equipped properly to perform its function. Briefings were concise, informative, and regularly performed. Job priorities were clearly identified. Information sharing was timely and status boards were well maintained. Contamination controls and radiological surveys were not always complete or proper. The fire brigade responded well to the simulated emergency situations, but some members did not perform proper pre-use tests, and one member did not have corrective lens inserts for respiratory protection equipment.

P4.5 Emergency Operations Facility (EOF)

a. Inspection Scope (82301-03.04)

The inspectors observed the EOF's staff as they performed tasks in response to the exercise scenario. These tasks included facility activation, emergency classification, notification of state and local response agencies, development and issuance of protective action recommendations, dose projections, field team control, and direct interactions with offsite agency response personnel. The inspectors reviewed applicable emergency plan sections and procedures, forms, dose projections, and logs.

b. Observations and Findings

The EOF was promptly staffed and activated following the 7:11a.m. alert declaration. Upon arrival, personnel signed in on the staffing board, reviewed position-specific procedures and checklists, contacted TSC counterparts, evaluated facility habitability, and synchronized the EOF clock. Minimum staffing was present at 7:44 a.m., and full staffing was present at 7:58 a.m. Emergency director duties/command and control functions (emergency classification, offsite agency notifications, and protective action recommendations) were transferred to the EOF at 8:48 a.m., following a formal and systematic turnover. The turnover was somewhat delayed by the 8:16 a.m. site area emergency declaration.

Management oversight in the EOF was good. Briefings were frequent and comprehensive. Facility members were given prior notice to prepare, and key facility personnel participated in the briefings. The briefings included input from technical, radiation protection, support, public affairs, state, and upon arrival, mock NRC personnel. Briefings appropriately included a discussion of facility priorities.

At 9:30 a.m., the EOF director correctly declared a general emergency based on a loss of two fission product barriers with a potential loss or loss of the third boundary. Although the general emergency condition was not immediately recognized, it was classified within a reasonable time frame (14 minutes). The conditions were present

at about 9:16 a.m.; however, the lack of a dose equivalent iodine value to compare to the emergency action levels caused some delay while discussions took place regarding the viability of using main steam line radiation levels instead. Corresponding offsite agency notifications were made quickly (within 15 minutes) after the event escalation. Supplemental notifications, with additional information concerning dose projections, were periodically issued in accordance with procedures.

Default protective action recommendations were made following the general emergency declaration; however, there was an inadequate review of the second dose projection after the radiological release started. The EOF and radiological directors failed to recognize that dose projections indicated a need to recommend protective actions beyond 10 miles. Inspectors made the following observations:

- At 9:33 a.m., a dose projection indicated that the thyroid committed dose equivalent at 10 miles was 5.28 Rem. This value exceeded the Environmental Protection Agency protective action guide of 5 Rem; however, there was no discussion between the EOF and radiological directors about the 10-mile thyroid dose or the validity of the dose calculations.

- The thyroid dose was communicated to offsite authorities via Message 6 and noted on the EOF dose assessment/protective action recommendation status board, but still no one recognized that the dose exceeded the protective action guides.

- Discussions about the potential to exceed the protective action guides did not occur until about 45 minutes after the calculations were available; however, the previous calculations were not discussed.

The failure to recognize the need for protective action recommendations beyond 10 miles was identified as an exercise weakness (50-498; 499/98013-01).

Wind direction was appropriately monitored to determine the need to include additional zones (affected sectors) in subsequent protective action recommendations. Due to shifting winds and weather forecasts, protective action recommendations were upgraded at 10:52 a.m. to include evacuation in an additional zone.

Following protective action recommendations, EOF personnel communicated the status of implemented offsite protective actions to plant personnel via the public address system. Inspectors determined that this special effort to communicate affected areas and offsite impact helped to relieve the concerns of emergency response personnel. However, reference to zones in the announcements may have been unclear to certain plant personnel.

Habitability in the EOF was appropriately monitored following the radiological release. The EOF emergency ventilation system was quickly switched to the recirculation mode, and habitability surveys were conducted periodically. In addition, contamination controls were established at the entrance to the EOF (those entering were directed through a portal monitor). However, thermoluminescent dosimeters

were not issued to EOF staff in a timely manner. Section B., Step 3.d, of the radiological director's checklist (Data Sheet 1 from 0ERP01-ZV-EF03, "Radiological Director," Revision 3) specified that thermoluminescent dosimeters be issued to EOF personnel if a radiological release is occurring or is imminent. The release started at about 9:16 a.m.; however, the dosimeters were not issued until 11:57 a.m. (about 2.5 hours later).

Aside from the aforementioned problem concerning the protective action recommendation, dose assessment and field team control activities were good. Numerous dose projections were calculated to estimate offsite impact. Offsite field monitoring teams were used to verify dose calculations; however, at times, the teams were not effectively controlled. First, on two occasions, Team 1 was directed into the plume at 1 mile (there were significant doses at this distance). There did not appear to be any information gained by the second entry; therefore, the entry was not consistent with as low as is reasonably achievable (ALARA) principles. Second, there did not appear to be coordination with the state concerning verification of doses at 10 miles. Utility teams were never directed beyond 6 miles. Inspectors determined that, given the initial dose calculation (protective action guides exceeded at 10 miles), confirming the leading edge may have been appropriate. A decision to issue potassium iodide to offsite field monitoring team members was quickly communicated (see 50-498; 499/96023-01 below).

Support personnel who were stationed in the EOF conscientiously performed necessary duties. A second shift roster was developed, and arrangements were made for laundry and bus services. It was clear that the support staff used the exercise as an opportunity to anticipate continuous staffing needs.

One news release was issued from the EOF prior to joint information center (JIC) activation. Following JIC activation, information bullets were issued from the EOF for inclusion in press releases. Although the news release and information bullets were appropriately approved by the EOF director, the news release issued from the EOF, and subsequent news releases issued by the JIC, were incomplete in that there was no mention of the notification of unusual event (the exercise scenario initiating event).

Interactions with state and mock NRC response team members who were stationed in the EOF were candid and cooperative. Upon arrival, state and NRC representatives were briefed on plant conditions and prognosis. The state's input was appropriately solicited during briefings.

c. Conclusions

The EOF staff's performance was good. Command and control responsibilities were transferred in a systematic manner. The general emergency condition was not immediately recognized but was classified within a reasonable time frame. Offsite agency notifications were made within regulatory limits. An exercise weakness was identified because the EOF and radiological directors failed to recognize that dose projections indicated a need to make protective action recommendations beyond

10 miles. Facility briefings were comprehensive, and a special effort was made to inform plant personnel of implemented offsite protective actions. At times, field teams were not always effectively controlled: one team was directed to enter the plume twice at the 1-mile point, and there was no coordination with the state to monitor or confirm radiation levels 10 miles downwind. Habitability surveys and facility access control were properly performed. There was good coordination with offsite agency response team personnel.

P4.6 Scenario and Exercise Control

a. Inspection Scope (82301 and 82302)

The inspectors evaluated the exercise to assess the challenge and realism of the scenario and exercise control.

b. Observations and Findings

The licensee submitted the exercise objectives and scenario for NRC review on May 4 and June 3, 1998, respectively. Both documents met pre-established schedule goals. The exercise objectives and scenario were appropriate to meet emergency plan requirements (reference NRC letters dated June 4 and 24, 1998). The exercise scenario was challenging and provided an above average vehicle to test onsite emergency response capabilities.

The following aspects of exercise conduct and control detracted from the realism and training value of the exercise and were considered areas for improvement:

1. There were a number of inappropriate interactions between evaluators/participants and observer/participants. Examples were observed in the following locations:

   - At the OSC, a controller asked the radiological coordinator how total effective dose equivalent was being tracked. This provided an opportunity for the radiological coordinator to identify that internal dose should be tracked in addition to external dose.

   - An EOF evaluator was observed talking to dose assessment personnel on several occasions and, on another occasion, asked the offsite communicator if supplemental notifications were made. The question could have prompted the action if it had not already been accomplished.

   - An observer in the EOF was observed talking to a participant.

2. Some scenario radiological data was missing, and some data appeared inconsistent with plant conditions.

- Radiological data were not supplied for the walkway between the isolation valve cubicle and the turbine generator building. Team 15 requested this information but was told that it was unavailable.

- A reduction in doses at Main Steam Isolation Valve B did not appear to be consistent with plant conditions. The doses reduced from 8 Rem to 2 Rem for no apparent reason.

3. Early in the exercise scenario, chemistry technicians performed a purge and sample of the reactor coolant system while the sample could not physically be taken. Technicians requested that the CR operators open sample root valves while a Phase A containment isolation was in place. However, controllers still allowed the sample to be taken and allowed dose rates in the sample room to increase.

c. Conclusions

The exercise objectives were appropriate to meet emergency plan requirements. The exercise scenario was challenging and provided an above average vehicle for testing emergency response capabilities. Some aspects of exercise conduct and control, such as, inappropriate evaluator/observer interactions with participants, controllers allowing participants to perform actions out of sequence, and inconsistent/incomplete data detracted from the training value of the exercise.

P4.7 Licensee Self Critique

a. Inspection Scope (82301-03.13)

The inspectors observed and evaluated the licensee's post-exercise facility critiques and the formal management critique on August 7, 1998, to determine whether the process would identify and characterize weak or deficient areas in need of corrective action.

b. Observations and Findings

Post-exercise facility critiques were generally very good. The critiques were well attended, thorough, open, and self critical. Inspectors identified the following notable exceptions:

- The CR simulator critique included input from controllers, evaluators, and participants but tended to be superficial. Participants and controllers indicated that priorities were properly set and communicated; however, these activities were not observed, and the lack of priorities in restoring electrical power was considered an area for improvement by the NRC inspectors. All but one of the "deltas" listed during the critique were attributed to outside sources (non-CR). Only one operator-specific issue was identified. The communications problems observed by the inspectors were not noted. In

fact, delays in certain briefings were considered positive by the participants and controllers.

- All participants and controllers were given the opportunity to provide input during the OSC critique; however, not all participants attended the critique.

- The post-exercise critique in the EOF was exceptionally thorough and very self-critical. It was clear that the team wanted to identify areas for improvement ("deltas") as well as pluses to build on. All facility personnel, including the state, participated in the critique.

The licensee continued to conduct a very professional and candid management critique. A handout was distributed to enhance the presentation. The exercise coordinator discussed the evaluation criteria and described the exercise scenario time line. Lead facility controllers presented the preliminary exercise findings, followed by comments from the corresponding facility manager/director. Two strengths were identified in the TSC, and two weaknesses were identified (one for exercise conduct and control, and one for protective action recommendations at the EOF). Minor problems were identified in all emergency response facilities. Once again, offsite agency representatives participated in the management critique. This practice continued to reinforce the bond between the utility/community/state emergency response team.

In addition to the South Texas Project Nuclear Operating Company evaluators, a peer evaluation was performed by representatives from other sites (Comanche Peak and Cooper). The addition of the peer evaluators added depth to the licensee's critique process.

c. Conclusions

Post-exercise critiques in the TSC, OSC, and EOF were very thorough, open, and self-critical. The post-exercise critique in the CR simulator was superficial and tended to focus on third-party problems. Only one operator-specific issue was discussed. A professional and candid management critique that included offsite agency representatives was conducted. The use of peer evaluators from other sites added depth to the critique process. The integrated critique process was identified as a program strength.

P8 Miscellaneous Emergency Preparedness Issues (92904)

(Closed) Inspection Followup Item 50-498; 499/96023-01: Exercise weakness for failure to communicate timely protective measures to offsite field teams. During the 1996 biennial exercise, the recommendation for offsite field teams to take potassium iodide occurred 55 and 72 minutes (Team 2 and the "rad van," respectively) after the emergency director's authorization. Corrective actions included communicating emergency director expectations to responsible individuals and revising procedures to consolidate forms. During the 1998 exercise, field monitoring teams were notified

within minutes of the emergency director's authorization for field team members to take potassium iodide.

V. Management Meetings

X1 Exit Meeting Summary

The inspectors presented the inspection results to members of licensee management at the conclusion of the inspection on August 7, 1998. The licensee acknowledged the facts presented. No proprietary information was identified.

The Federal Emergency Management Agency scheduled a public meeting on August 6, 1998, to discuss the preliminary exercise results. Since there was no media or public attendance at the meeting, the meeting was convened and immediately adjourned.

ATTACHMENT

SUPPLEMENTAL INFORMATION

PARTIAL LIST OF PERSONS CONTACTED

Licensee

L. Barton, Coordinator, Offsite Emergency Response Program
W. Bullard, Supervisor, Health Physics
T. Cloninger, Vice President, Nuclear Engineering
W. Cottle, President and Chief Executive Officer
J. Enoch, Staff Specialist, Emergency Response
J. Groth, Vice President, Nuclear Generation
R. Hutchinson, Specialist, Emergency Response Operations
K. Keyes, Specialist, Emergency Response Staff
M. Keyes, Specialist, Emergency Response Staff
R. Masse, Plant Manager, Unit 2
M. McBurnett, Director, Nuclear Licensing
R. Meier, Coordinator, Emergency Response Training Program
J. Phelps, Manager, Plant Operations, Unit 1
G. Powell, Manager, Health Physics
F. Puleo, Supervisor, Emergency Response
P. Serra, Manager, Emergency Preparedness
J. Sheppard, Vice President, Business Systems
V. Wagner, Specialist, Emergency Response

Other

J. Engbrock, Emergency Management Coordinator, Matagorda County
S. Flowerday, Emergency Planner, Bureau of Radiation Control, State of Texas
R. Frieda, Chief Deputy, Matagorda County Sheriff's Department
G. Froemsdorf, Emergency Planner, Bureau of Radiation Control, State of Texas
D. Hood, Manager, Emergency Preparedness, Comanche Peak
B. Huebner, Judge, Matagorda County
C. Johnson, Onsite Liaison, Central Power & Light
J. Mitchell, Sheriff, Matagorda County
A. Spears, Pierce Lieutenant, Department of Public Safety

NRC

N. O'Keefe, Senior Resident Inspector

LIST OF INSPECTION PROCEDURES USED

IP 82301	Evaluation of Exercises at Power Reactors
IP 82302	Review of Exercise Objectives and Scenarios for Power Reactors
IP 92904	Followup - Plant Support

LIST OF ITEMS OPENED AND CLOSED

Opened

50-498; 499/98013-01	IFI	Exercise weakness - Failure to recognize the need to make protective action recommendations beyond 10 miles (Section P4.5)

Closed

50-498; 499/96023-01	IFI	Exercise weakness - Failure to communicate timely protective measures to offsite field teams (Section P8)

LIST OF ACRONYMS USED

ALARA	As low as is reasonably achievable
CR	Control room
EOF	Emergency operations facility
JIC	Joint information center
OSC	Operations support center
TSC	Technical support center

LIST OF DOCUMENTS REVIEWED

Emergency Plan Implementing Procedures

0ERP01-ZV-EF01	EOF Director	Revision 8
0ERP01-ZV-EF03	Radiological Director	Revision 3
0ERP01-ZV-EF10	Offsite Field Team Supervisor	Revision 4
0ERP01-ZV-IN01	Emergency Classification	Revision 3
0ERP01-ZV-IN02	Notifications to Offsite Agencies	Revision 7
0ERP01-ZV-IN03	Emergency Response Organization Notification	Revision 7
0ERP01-ZV-IN04	Assembly and Accountability	Revision 7
0ERP01-ZV-IN06	Radiological Exposure Guidelines	Revision 3
0ERP01-ZV-IN07	Offsite Protective Action Recommendations	Revision 4
0ERP01-ZV-OS01	OSC Coordinator	Revision 1
0ERP01-ZV-OS02	Assistant OSC Coordinator	Revision 1
0ERP01-ZV-OS03	Radiological Coordinator	Revision 2
0ERP01-ZV-OS06	Emergency Teams	Revision 4
0ERP01-ZV-SH01	Shift Supervisor	Revision 10
0ERP01-ZV-TS01	TSC Manager	Revision 7

Other Procedures

0POP03-ZG-0006	Plant Shutdown from 100% to Hot Standby	Revision 8
0PEP07-TM-0007	Main Turbine Generator Startup Following Major Outage	Revision 7
0POP04-AE-0001	Loss of Any 13.8 KV or 4.16 KV Bus	Revision 11
0POP05-E0-EC00	Loss of All AC Power	Revision 10
0POP05-EO00	Reactor Trip or Safety Injection	Revision 11
0POP05-EO-EO10	Loss of Reactor or Secondary Coolant	Revision 9
0POP05-EO-EO20	Faulted Steam Generator Isolation	Revision 3
0PGP03-ZR-0054	Respiratory Protection Program	Revision 5
0PRP06-ZR-0002	Respiratory Protection Equipment Issue and Return	Revision 6
0PGP03-ZF-0002	Fire Brigade Drills	Revision 4

Other Documents

South Texas Project Electric Generating Station Emergency Plan, Revision 18

Response to Emergency Preparedness Weakness (50 498; 499/9623-01), dated December 16, 1996

1998 Graded Emergency Response Exercise Objectives, dated May 4, 1998

1998 Graded Emergency Preparedness Exercise Scenario, dated June 3, 1998