



UNITED STATES
 NUCLEAR REGULATORY COMMISSION
 REGION II
 101 MARIETTA STREET, N.W.
 ATLANTA, GEORGIA 30323

JUL 21 1992

Report Nos.: 50-325/92-16 and 50-324/92-16

Licensee: Carolina Power and Light Company
 P.O. Box 15E1
 Raleigh, NC 27602

Docket Nos.: 50-325 and 50-324 License Nos.: DPR-71 and DPR-62

Facility Name: Brunswick 1 and 2

Inspection Conducted: June 2-4, 1992

Inspectors: Fred N. Wright July 12, 1992
 F. Wright Date Signed

Team Members: K. Clark
 M. Shannon
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Approved by: William H. Rankin July 17, 1992
 William H. Rankin, Chief
 Emergency Preparedness Section
 Radiological Protection and Emergency
 Preparedness Branch
 Division of Radiation Safety and Safeguards

SUMMARY

Scope:

This routine, announced inspection involved the observation and evaluation of the annual emergency preparedness exercise. This full participation exercise was conducted on June 3, 1992 between the hours of 8:00 a.m. and 3:00 p.m. Selected areas of the licensee's emergency response facilities and organization were observed to evaluate the effectiveness of the licensee's implementation of the Radiological Emergency Plan and procedures in providing for the health and safety of the public and onsite personnel during a simulated emergency. The inspection also included a review of the exercise scenario and observation of the licensee's post exercise critique.

Results:

In the areas inspected, no violations or deviations were identified. One exercise weakness was identified for failure to dispatch mission teams to effectively mitigate plant accident conditions through recovery operations. The licensee demonstrated the ability to identify initiating conditions, and determine Emergency Action Level parameter and correctly

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classify the emergency throughout the exercise. Overall, the licensee's performance during the exercise was good, with the licensee meeting most of their exercise objectives and demonstrating a capability to protect the public health and safety in the event of a radiological emergency. Control Room command and control and the licensee's critique process were exercise strengths.

REPORT DETAILS

1. Persons Contacted

Licensee Employees

- *K. Ahern, Manager, Operations
- B. Altman, Manager of Regulatory Compliance
- *R. Baldwin, Lead Offsite Controller
- D. Barnard, Control Room Simulator Controller
- *E. Bean, Corporate Communications
- *M. Bradley, Manager
- *S. Dunlap, Emergency Preparedness
- *K. Fennell, Manager, Balance of Plant Systems
- *S. Floyd, Manager, Regulatory Compliance
- *R. Godley, Regulatory Compliance
- R. Goodwin, Emergency Operations Facility Lead Controller
- *M. Hearl, Technical Support
- *R. Helme, Manager, Technical Support, Site Emergency Coordinator
- *M. Highsmith, Communications Controller
- *J. Holder, Emergency Recovery Manager
- *B. Houston, Emergency Preparedness Coordinator
- *R. Indelicato, Exercise Director
- R. Johnson, Technical Analysis Manager
- *P. Leich, Radiation Control
- *W. Martin, NED
- *G. Miller, Manager, Nuclear Systems
- *K. Neuschaefer, Principal Specialist/Health Physics
- *B. Noland, Manager
- *J. O'Connor, Acting Unit Manager, NED
- *B. Peeler, Assistant Emergency Recovery Manager
- *R. Richey, Vice President
- *C. Rhodes, Technical Support
- *J. Spencer, General Manager
- *D. Standard, Corporate Communications
- J. Terry, Radiological Control Manager
- L. Tice, Emergency Communicator
- *G. Warriner, Administration and Logistics Manager
- *M. Williams, Lead Control Room Simulator Controller

Other licensee employees contacted during this inspection included engineers, technicians, and administrative personnel.

Nuclear Regulatory Commission

- *D. Nelson, Resident Inspector
- *R. Prevatte, Senior Resident Inspector

* Attended exit meeting

2. Review of Exercise Objectives and Scenarios For Power Reactors (82302)

The scenario for the emergency exercise was reviewed to determine that provisions had been made to test the integrated capability and a major portion of the basic elements existing within the licensee's Emergency Plan and organization as required by 10 CFR 50.47(b)(14), 10 CFR 50, Appendix E, Paragraph IV.F, and specific criteria in NUREG-0654, Section II.N.

The scenario was reviewed in advance of the scheduled exercise date and was discussed with licensee representatives. The scenario was adequate to exercise fully the onsite and offsite emergency organizations of the licensee. The exercise scenario was well organized, detailed, and adequate to exercise the participants.

In general, the controllers provided adequate guidance throughout the exercise. The inspector observed adequate interactions between the controllers and the players.

No violations or deviations were identified.

3. Assignment of Responsibility, Evaluation of Exercises For Power Reactors (82301)

This area was observed to determine that primary responsibilities for emergency response by the licensee had been specifically established and that adequate staff was available to respond to an emergency as required by 10 CFR 50.47(b)(1), 10 CFR 50, Appendix E, Paragraph IV.A, and specified criteria in NUREG-0654, Section II.A.

The inspector observed that the onsite and offsite emergency organizations were adequately described and the responsibilities for key organization positions were clearly defined in approved plans and implementing procedures. The inspector observed the activation, staffing, and operation of the emergency organization in the Control Room Simulator (CRS), Technical Support Center (TSC), the Operations Support Center (OSC), Joint Information Center (JIC) and the Emergency Operations Facility (EOF). The inspector determined that adequate staff was available to respond to the simulated emergency. The required staffing and assignment of responsibility were consistent with the licensee's approved procedures.

Because of the scenario scope and conditions, long term or continuous staffing of the emergency response organization was not required. Discussions with licensee representatives indicated that sufficient technical staff were available to

provide continuous staffing for the augmented emergency organization, if needed.

No violations or deviations were identified.

4. Onsite Emergency Organization, (82301)

The licensee's on-shift emergency organization was observed to determine that the responsibilities for emergency response were unambiguously defined, that adequate staffing was provided to insure initial facility accident response in key functional areas at all times, and that the interfaces were specified as required by 10 CFR 50.47(b)(2), 10 CFR 50, Appendix E, Paragraph IV.A, and specific criteria in NUREG-0654, Section II.B.

The inspector observed that the initial onsite emergency organization was adequately defined in Section 3 of the Radiological Emergency Plan and the organizational structure, responsibilities, and authority for directing actions necessary to respond to an emergency were clear. The inspector determined that staff were available to fill key functional positions within the organization and that onsite and offsite interactions and responsibilities were clearly defined.

In accordance with the Radiological Emergency Plan, the Plant Manager or his alternate Manager of Technical Support became the Site Emergency Coordinator (SEC) and maintained overall on-site emergency response responsibilities. Upon activation of the EOF, the Emergency Response Manager assumed responsibility of overall emergency response and performed those requirements for all off-site related activities.

The licensee adequately demonstrated the ability to alert, notify, and mobilize CPL emergency response personnel. Augmentation of the initial onsite emergency response organizations was accomplished through mobilization of additional day-shift personnel. Following the Alert declaration, the on-shift emergency organization was augmented with the activations of the TSC, OSC, and EOF Emergency Response Facilities (ERFs).

No violations or deviations were identified.

5. Emergency Classification System, (82301)

This area was observed to determine that a standard emergency classification and action level scheme was in use by the nuclear facility licensee as required by 10 CFR 50.47(b)(4), 10 CFR 50, Appendix E, Paragraph IV.C, and specific criteria in NUREG-0654, Section II.D.

An Emergency Action Level scheme described in Section 2.0 of the Radiological Emergency Plan was used to promptly identify and properly classify the emergency through the Plant Emergency Procedure (PEP) 02.01 "Initial Emergency Actions".

The Notification Of Unusual Event (NOUE), Alert, Site Area Emergency, and General Emergency classifications were timely and correct by procedure.

- The NOUE was declared at about 9:15 a.m. on the basis of a seismic monitor alarm and confirmation of an earthquake.
- The Alert was declared at about 10:06 a.m. on the basis of loss of shutdown function, loss of Residual Heat Removal loops A and B and loss of condenser condensate system.
- The Site Area Emergency was declared at about 11:30 a.m. on the basis of the loss of two fission product barriers (fuel cladding and reactor coolant boundary).
- A General Emergency was declared at about 12:17 a. m. on the basis of degrading plant conditions and potential loss of the third fission product barrier (containment).

No violations or deviations were identified.

6. Notification Methods and Procedures (82301)

This area was observed to assure that procedures were established for notification of State and local response organizations and emergency personnel by the licensee, and that the content of initial and followup messages to response organizations were established. This area was further observed to assure that means to provide early notification to the population within the plume exposure pathway were established pursuant to 10 CFR 50.47(b)(5), Paragraph IV.D of Appendix E to 10 CFR 50, and specific guidance promulgated in Section II.E of NUREG-0654.

The inspector reviewed the licensee's implementing procedures for notifying offsite authorities and the NRC. The inspector observed that notification methods and procedures were used promptly to provide information concerning the simulated emergency conditions to Federal, State, and local response organizations and to alert the licensee's augmented emergency response organization. Notifications to the State of North Carolina and designated local offsite organizations were initiated within 15 minutes following the classification and declaration of the emergency event. However, the inspector noted that it took up to 20 minutes for the licensee to complete the notification process.

The inspector determined that completed Notification forms to offsite authorities included appropriate information including; emergency conditions, emergency classifications, radioactivity release status, potentially affected population, projected population doses, recommended protective actions, and any changes to these conditions. The inspector observed minor omissions and errors on some notification forms and observed the correction of errors during or just prior to offsite transmittal. The inspector noted that the licensee had identified the notification problems in the critique process and documented them as deficiencies requiring corrective action. The inspector pointed out that the offsite notification process may be expedited by the use of concurrent facsimile message with telephone notification. The inspector reported that the licensee's corrective action for the deficiencies would be reviewed in a future inspection as an Inspector Followup Item.

50-324/92-16-01, Inspector Followup Item: Review licensee's corrective actions for offsite notification problems identified during the 1992 annual exercise.

No violations or deviations were identified.

7. Emergency Communications (82301)

This area was observed to determine that provisions existed for prompt communications among principal response organizations and emergency personnel as required by 10 CFR 50.47(b)(6), 10 CFR 50, Appendix E, Paragraph IV.E, and specific criteria in NUREG-0654, Section II.F.

The inspector observed that adequate communications existed among the licensee's emergency organizations and between the licensee's emergency response organization and offsite

authorities. However, some communication problems were identified. Miscellaneous communication problems identified by the licensee and NRC inspectors included:

- Flow of information from mission teams to CRS was slow;
- Messages given on plant Public Address (PA) system were presented once and not repeated causing some of the staff to miss exercise information;
- Problems concerning the review of news release content and news release distribution were identified (See paragraph 8.e);
- CRS communicator did not contact Resident NRC Inspector;
- There was very little use of "repeat backs" in communications;
- "Roll Calls" were not performed during transmittal of Event Notifications;
- A state warning point placed a licensee communicator on hold; and
- The licensee's radio for environmental monitoring teams did not have the channel used by the state's monitoring team.

The licensee documented the problems in their critique process for review and identified the significant issues as deficiencies requiring corrective action.

No violations or deviations were identified.

8. Emergency Facilities and Equipment (82301)

This area was observed to determine that adequate emergency facilities and equipment to support an emergency response was provided and maintained as required by 10 CFR 50.47(b)(8), 10 CFR 50, Appendix E, Paragraph IV.E, and specific criteria in NUREG-0654, Section II.H.

a. Emergency Medical Drill

This area was observed to determine whether first aid to a contaminated injured individual was effectively provided and to assure appropriate actions were taken to prepare an injured and contaminated individual for transport to an offsite hospital.

Health Physics staff responding to the medical emergency drill provided initial first aid for the injured patient and provided good radiological protection controls at the accident site.

Contamination monitoring and control were provided, but in a manner not to impede the first aid treatment. The first aid team responded properly and no significant problems were identified with their efforts. The simulated contaminated injured worker was prepared for ambulance transport when the exercise was terminated. The licensee's response was effective and efficient.

No violations or deviations were identified.

b. Simulator Control Room

Overall, operations personnel adequately assessed the problems faced during the exercise and their responses were appropriate to the circumstances. Actions, classifications, and notifications were effectively accomplished. Both reactor operators and supervisors demonstrated excellent understanding and good use of the normal, abnormal, emergency operating procedures, and the emergency plan implementing procedures throughout the exercise.

A qualified staff member was available to notify the Federal, State and local authorities of the emergency within 15 minutes of the emergency declaration and to maintain communications with offsite agencies, as needed.

The Operations Shift Foreman command and control appeared to be effective. The Notification of Unusual Event and Alert classifications made by the CRS staff were correct and timely.

No violations or deviations were identified.

c. Technical Support Center

The inspector observed the initial activation and personnel response in the staffing of the TSC. The TSC was activated at 10:06 a.m., upon declaration of the Alert classification, by the SEC. The TSC was declared operational at 10:41 a.m. by the TSC Supervisor. The TSC was activated, fully staffed, and functional in a timely manner.

The TSC Supervisor was well qualified, appeared knowledgeable of his duties and responsibilities, and assumed the responsibilities in a professional and organized manner.

The SEC and his staff in the TSC were very sensitive to the need to prioritize emergency repairs and the early projection of expected emergency depressurization due to exceeding heat capacity was noteworthy.

In general, communication and information flow in the TSC was accurate and timely. All primary communication systems were functionally properly. The SEC's routine briefings were informative. The status boards were frequently updated and adequately maintained throughout the exercise and tracking and tending of plant parameter data provided real time, accurate information for the TSC staff. However, the inspector noted that the congestion and noise levels in the TSC were high resulting in some confusion and numerous requests by the SEC to keep noise levels down. The issue was identified by the licensee as a deficiency.

The licensee periodically assessed the habitability of the TSC.

No violations or deviations were identified.

d. Operational Support Center

The inspector observed the initial activation and personnel response in the staffing of the OSC. The OSC was activated in a timely manner, with a large staff, approximately seventeen minutes after the Alert declaration.

The inspector noted that the OSC facilities and supplies were adequate to support radiological surveys but supplies and equipment to support emergency repairs would have to be obtained from other plant facilities.

Initially communications in the OSC were good. The first two briefings addressed plant conditions, radiological conditions, and emergency status. Subsequent briefings lacked sufficient detail to keep OSC members informed of plant conditions. This observation was based on workers having to ask about plant conditions.

The OSC leader made an error when he announced the upgrade from Alert to Site Area Emergency. A Site Area Emergency was heard over the OSC-TSC conference line, which prompted the OSC leader to call the TSC. The OSC leader then announced that a general site emergency had been declared. The OSC staff then posted a General Emergency and briefed the OSC workforce. Some of the OSC staff overheard the initial site Area Emergency

declaration over the OSC-TSC phone but did not question the General Emergency declaration. It was noted that the PA system could not be clearly heard in the OSC control center and this directly contributed to the wrong declaration by the OSC leader. The OSC members did not question the General Emergency declaration and apparently did not hear the PA announcement, or were not paying close attention. The licensee identified the issue as a comment in their critique process.

Some OSC team missions were not dispatched in a timely manner which was apparently caused by a lack of expressed urgency from the TSC and excessive discussion and caution on the part of the OSC staff. The following list details some of the request and mission start times.

	Authorized TSC Request	Mission Out
Mission 3	10:40	11:55
Mission 4	10:54	12:35
Mission 5	10:55	11:32
Mission 7	11:24	11:53
Mission 12	12:48	13:50

The OSC staff questioned the validity of a mission (Mission 4) to restore Service Air (SA) and therefore did not dispatch a team until 1 hour and 41 minutes after it was approved. The OSC staff was observed discussing the purpose for the mission which took time away from other OSC missions. At 11:37 a.m. the TSC established restoration of SA as it's number one priority but the OSC did not dispatch the team until 12:35 p.m.

Mission 7 which was requested to troubleshoot and repair bus E-2 was delayed even though the bus was required for returning safety equipment and additional buses for drywell venting. When the mission team did get to the field, it was not properly staffed or equipped to carry out the TSC's objective to troubleshoot and repair the E-2 bus. To complete the task the electricians would have had to meggar the bus as a minimum prior to returning the bus to operation. Also, if a fault was found, an inspection of the breakers and bus would be required to find and repair the fault, but only one electrician was assigned to the team and he did not bring a meggar, voltmeter, protective safety equipment, or other tools. The mission team noted the flopped fault flags and reported back to the OSC. The OSC then failed to provide any further guidance or direction. At approximately

12:07 p.m. the team suggested to the OSC that it appeared that bus E-6 could safely be cross-tied with E-5 but the OSC did not provide any further guidance or direction.

Mission 12 which was requested because core spray was not injecting and the reactor water level was low out of sight. The objective of the mission was to manually open 1-E21-F005B and 1-F21-F002B, providing a water injection path to the core. The mission needed to accomplish its objective within several minutes to prevent reactor core uncover, but this task took over an hour to perform.

Missions 7 and 12 were required to protect the reactor core and to prevent the loss of primary containment integrity. The TSC did not effectively convey the urgency in these missions and the OSC did not recognize the urgency, therefore these missions were not completed in a timely manner. The E-2 bus repair was not pursued and the controllers had to give the bus back to the players in order to keep the scenario on line. Due to a lack of effective action, on the part of the mitigation teams from the OSC, the integrities of the reactor core, reactor vessel, and drywell were jeopardized.

The inspector made the following observations:

- Repair team activities associated with opening 1-E21-F005B and 1-F21-F002B were not expedited in a way consistent with their importance;
- Mission statements were not always adequate, by themselves, to communicate the scope of work required;
- Mission authorization sheets did not contain enough information (primarily locations) to allow adequate evaluation by the Radiological Controls Director;
- The "urgency" of various missions, except for mission 009, was not effectively communicated to the OSC;
- There was no gradation of priority, missions seem to be either "high" priority or they have no priority at all. At one time, four of six missions were "top" priority.

The inspector noted that the licensee had identified mission team problems in their critique process as a deficiency requiring corrective action. The inspector reported that failure of the licensee to dispatch mission teams to effectively mitigate plant accident

conditions through recovery operations appeared to be an exercise weakness.

Exercise Weakness 50-324/92-16-02: Failure of dispatched mission teams to effectively mitigate plant accident conditions through recovery operations.

No violations or deviations were identified.

e. Emergency Operations Facility

The EOF was set-up, staffed, and activated expeditiously with qualified personnel. However, the Emergency Response Manager appeared to activate the EOF more on the basis of personnel being present than on their being ready to activate or it being the best time to activate. The inspector noted the following:

- The ERM requested and received manager status briefings and then announced turnover with the TSC would occur in 2 minutes. At the appointed time (12:00 a.m.), the SEC, although interrupted several times by more urgent requirements in the TSC, provided the information outlined in Exhibit 2.6.16-2 "Site Emergency Coordinator/Emergency Response Manager Checklist" of PEP-12.6.16 "Emergency Response Manager", Revision 14;
- The EOF was activated at 12:09 a.m., however, the EOF plant status boards were not filled out for 30 to 60 minutes after activation;
- The Technical Analysis Manager who in his briefing had erroneously reported reactor water level steady, later acknowledged that it took them an hour to get up to speed; and
- At time of EOF activation, the TSC communicators were still in the process of sending out message #5. At the time of activation, dose projection responsibility was still in the TS

It appeared that the activation may have been premature, however, no significant problems were identified with the activation.

The EOF was well equipped with status boards and space was sufficient to allow the staff to perform their duties. The licensee's EOF facility also served as a classroom when the facility was not activated. In this exercise, setting up the EOF took an hour using personnel familiar with the layout and telephone connections. If the EOF was ordered activated before being set up, one could anticipate an extended time being required to make the space operational before

starting the activation process. The licensee reported that plans had been approved to make the EOF facility a dedicated facility in 1993. Once the facility becomes dedicated, setup time should be reduced significantly.

The ERM demonstrated good command and control of the EOF. The ERM also did a good job of incorporating the State officials into the EOF and having them provide briefings along with the other EOF managers.

The ERM and Administrative and Logistics Manager demonstrated good anticipation of problems such as the need for additional survey teams, the need for accommodations for additional people coming to the area, the problems to be caused by badging the additional people, the potential problems caused by the earthquakes such as blocked roads, damaged bridges, inoperative sirens, etc.

The difference between dose projections which were "hypothetical" or "actual" caused confusion within the EOF. The EOF dose projection status board was inadequately maintained and when used did not make a distinction between the two projections. The licensee identified the issue in the critique process, but did not identify the issue as a deficiency.

Security personnel provided good coverage in controlling center access and the Radiation Protection staff periodically assessed the habitability of the EOF.

No violations or deviations were identified.

f. Emergency News Center

The ENC was staffed and activated by pre-staged response personnel. The inspector observed the preparation of news releases and the preparation of material for briefings. The Joint Information Center facilities for utility, State, local, and NRC representatives were adequate, however, inspectors noted that the media work area space was limited and could become unsatisfactory with a large cadre of media personnel.

The licensee's facilities were small and the number of telephones available for media personnel during an emergency is small. The licensee reported that they had attempted to establish an agreement with communication networks and suppliers to install additional telephones should activation of the center

become necessary. However, the licensee reported that their telecommunications vendor could not establish a contract that would guarantee delivery and installation of additional telephones in a timely manner. According to the licensee a pre-agreement to supply additional telephones would not ensure that telephones could be connected and in use any earlier than if the request was made when they were needed.

The licensee experienced several problems with the coordination of news releases during the exercise. Problems included:

- The JIC Technical Advisor was not able to get timely or detailed information of plant status;
- Joint Information Center activated prior to activation of the EOF;
- News releases were not approved in a timely manner, News release number 2 was not approved by the SEC;
- Press releases and messages were not checked thoroughly enough to detect omissions and errors, News release number 4 concerning the declaration of a Site Area Emergency was not approved and released until 12:17, which was 5 minutes after the general emergency declaration had been declared; and
- News release numbers 2, 4, and 6 were not provided to the TSC.

The licensee identified the problems associated with the news releases as a deficiency requiring corrective action.

No violations or deviations were identified.

9. Accident Assessment (82301)

This area was observed to determine whether adequate methods, systems, and equipment for assessing and monitoring actual or potential offsite consequences of a radiological emergency condition were in use as required by 10 CFR 50.47(b)(9), 10 CFR 50, Appendix E, Paragraph IV.B, and specific criteria in NUREG-0654, Section II.I.

The accident assessment program included both an engineering assessment of plant status and an assessment of radiological hazards to onsite and offsite personnel resulting from the accident. Technical assessment staff was partially effective in making recommendations to the SEC concerning mitigating actions to reduce damage to plant equipment. However, the inspector noted the technical assessment staff

had not effectively addressed the following problems:

- Engineering assessment did not develop specific methods for re-energizing electrical buses E2 and E6 and did not consider cross-tie of buses until suggested by an auxiliary operator;
- The staff did not recognize that Core Spray "A" was not injecting; and
- Did not question apparently contradictory estimates of core damage, i.e. release of 1% of core inventory to Reactor Coolant System with only 10% clad damage.

The problems listed above are similar in nature to those deficiencies identified by the licensee although the licensee did not address all of the above problems in their critique. However, the licensee did identify a communication problem between the CRS and the TSC as an element of a communication deficiency between emergency response facilities. The licensee also identified a deficiency for the TSC's failure to re-establish instrument air.

Onsite and offsite radiological monitoring teams were dispatched to determine the level of radioactivity in those areas within the influence of the simulated plume. The teams effectively demonstrated their capability to collect those data points and relay those data to the emergency response facilities.

No violations or deviations were identified.

10. Protective Responses (82301)

This area was observed to determine that guidelines for protective actions during the emergency, consistent with Federal guidance, were developed and in place, and protective actions for emergency workers, including evacuation of nonessential personnel, were implemented promptly as required by 10 CFR 50.47(b)(10), and specific criteria in NUREG-0654, Section II.J.

The inspector verified that the licensee had and used emergency procedures for formulating PARS for offsite populations within the 10 mile Emergency Planning Zone. The licensee demonstrated the ability to promptly recommend offsite protective actions that were consistent with those

in the emergency plan. PARS were routinely reevaluated for accuracy and status updates were provided to the offsite authorities.

No violations or deviations were identified.

11. Exercise Critique (82301)

The licensee's critique of the emergency exercise was observed to determine whether shortcomings in the performance of the exercise were brought to the attention of management and documented for corrective action pursuant to 10 CFR 50.47(b)(14), 10 CFR 50, Appendix E, Paragraph IV.E, and specific criteria in NUREG-0654, Section II.N.

The licensee conducted facility critiques with exercise players immediately following the exercise termination. Licensee controllers and observers conducted additional critiques prior to the formal critique to management on June 04, 1992. Issues identified by the licensee's staff during the exercise were discussed by licensee representatives during the critique. The licensee's critique was thorough and addressed both substantive deficiencies and improvement areas. The licensee's critique was considered a program strength. The inspector reported that licensee action on identified findings will be reviewed during subsequent NRC inspections. The conduct of the critique was consistent with the regulatory requirements and guidelines cited above.

No violations or deviations were identified.

12. Exit Interview

The inspector met with licensee representatives (denoted in Paragraph 1) at the conclusion of the inspection on June 4, 1992. The inspector described the areas inspected and discussed in detail the inspection results listed below. The licensee did not identify any such documents or processes as proprietary. Dissenting comments were not received from the licensee.

<u>Item Number</u>	<u>Description and Reference</u>
50-324/92-16-01	Inspector Followup Item: Review licensee's corrective actions for offsite notification problems identified during the 1992 annual exercise.

50-324/92-16-02

Exercise Weakness: Failure of dispatched mission teams to effectively mitigate plant accident conditions through recovery operations (Paragraph 8.d)

Attachments:
Exercise Objectives, Narrative
Summary, and Time Line

CAROLINA POWER & LIGHT COMPANY
PLAN FOR BRUNSWICK STEAM ELECTRIC PLANT EMERGENCY EXERCISE
JUNE 2, 1992

1.0 INTRODUCTION

The purpose of the exercise is to activate and evaluate major portions of emergency response capabilities and other elements of the CP&L Brunswick Steam Electric Plant Plan, associated implementing procedures, and the CP&L Corporate Emergency Plans in accordance with Nuclear Regulatory Commission (NRC) Regulation 10CFR50.47(b).

2.C OBJECTIVES AND GUIDELINES

2.1 GENERAL INFORMATION

1. Scope

A simulated accident at the Brunswick Steam Electric Plant (BSEP) which could escalate to a general emergency and will involve planned response and recovery actions to include: emergency classification; notification of off-site organizations and plant personnel; actions to correct the emergency conditions; and initiation of accident assessment and protective actions as necessary to cope with the accident. The exercise will simulate an emergency that results in off-site radiological releases which will not require responses by state and local government personnel (state and county participation will be simulated).

2. Objectives

The 1992 Brunswick Emergency Preparedness Exercise will provide an opportunity for emergency response personnel to:

- a. The ability of the control room to detect accident conditions, assess and project radiological consequences, and formulate near-term mitigating actions.
- b. The adequacy of the Technical Support Center in providing accident assessment and mitigation, dose assessment, and communication/notification activities.
- c. The ability to identify and properly classify the emergency in accordance with the Emergency Plan and implementing procedures.
- d. The adequacy of procedures for alerting, notifying, and mobilizing emergency response organization personnel.
- e. The timeliness of initial and follow-up notification to responsible state and local government agencies.
- f. The adequacy of the information provided to responsible state and local government agencies in the initial and follow-up notifications.

- g. The capability to make timely and accurate notifications to the Nuclear Regulatory Commission. (Actual participation of the NRC Operations Center may be simulated.)
- h. The ability to effectively communicate with plant emergency teams and Company environmental monitoring teams.
- i. The ability to communicate between emergency response facilities.
- j. The ability to support the radiological assessment process while maintaining personnel radiation exposure as low as reasonably achievable (ALARA).
- k. The capability to perform radiological monitoring activities and assessment.
- l. The ability to provide adequate radiation protection services such as dosimetry and personnel monitoring.
- m. The ability to adequately control the spread of contamination and the radiological exposure of onsite and offsite emergency workers.
- n. The ability to formulate appropriate protective action recommendations to offsite government authorities.
- o. The Technical Support Center, Operational Support Center, and Emergency Operations Facility can be activated in accordance with the emergency plan and its implementing procedures.
- p. The ability to coordinate news releases and other public information between CP&L and offsite government authorities.
- q. The ability to coordinate the preparation, review, and release of information for the news media.
- r. The ability to control rumors in accordance with the public information procedures.
- s. The ability to prepare for and conduct adequate briefings concerning plant events for the media.
- t. The adequacy of the interface between the offsite response personnel and the plant personnel.
- u. The ability to provide onsite access to offsite emergency services and support.
- v. The activation, operation, and reporting of field monitoring teams.
- w. The assessment of radiological consequences of the accident and of any releases of radioactive material to the environment.
- x. The ability to reassess plant conditions and evaluate recovery considerations as defined by the plant emergency plan.

- y. The previously identified NRC open items resulting from the previous year's exercise can be closed. (No open items remain from the 1991 emergency preparedness exercise.)

3. Exercise Dates

- a. Pre-Exercise Evaluator Meeting: June 1, 1992
TSC/EOF Training Building, Room No. 143
- b. Exercise: June 2, 1992
- c. Evaluator Group Meeting: June 2, 1992
- d. Lead Evaluator Meeting: June 3, 1992, 9 a.m., Room 143
- e. Post Exercise Critique Report to Players: June 4, 1992, 9 a.m., Room 122
- f. NRC Exit/Critique: June 4, 1992

4. Exercise Locations/Facilities

- a. Brunswick Plant, Southport, North Carolina
- (1) Control Room - Function is to provide plant control and initial direction of all plant related emergency conditions. Play for the Control Room will be from the Simulator located in the Training Building. The Simulator will not be used in an interactive mode, but will be used for communication and interaction with other facilities.
- (2) Operations Support Center (OSC) - The OSC will be located in the Service Building. The function of the OSC is to provide an area for assembly and briefing of off-shift and other support personnel.
- (3) Technical Support Center (TSC) - The Technical Support Center is located in the Training Building and is to provide an assembly location for technical personnel who provide engineering and management support of plant activities following an accident; direction and coordination of overall plant emergency activities; direction and coordination of field, mobile, radiological monitoring teams prior to EOF activation; on-site dose projections; off-site dose projections prior to EOF activation; display of status of plant parameters; and provide an emergency reference collection of selected engineering and plant documents. The TSC is activated and emergency functions performed in accordance with the provisions of the plant radiological emergency response plan and procedures.

The TSC will perform the Emergency Operations Facility (EOF) functions until the EOF is operational. In addition to the normal plant communications system, redundant emergency

3.0 SCENARIO

3.1 TIMELINE, NARRATIVE, AND EXERCISE BASICS

At the start of the exercise, Unit 1 has been operating at 100% power for 140 days. The unit is in day 6 of an LCO on "B" Loop RHR. Maintenance is in progress of replacing the valve stem on 1-E11-F004B. Containment deairing is in progress for drywell entry upon shutdown. Drywell floor drain leakage is presently at 2 gpm. The starting air compressor for number 2 Diesel Generator cracked the compressor head yesterday. A replacement compressor is on order, and starting air system is crosstied.

Unit 2 is defueled in day 42 of a scheduled 77 day outage. The Conventional Service Water Pump Discharge Valves are removed for modification. "2A" and "2B" Turbine Building Closed Cooling Water Heat exchangers have been shipped off site for refurbishment. The "2C" Turbine Building Closed Cooling Water Heat Exchanger is in service and cooled by Unit 1 Conventional Service Water.

The exercise is initiated by a seismic event of approximately .07 g. Annunciators are immediately received that indicate problems with #2 Diesel and incoming power lines to the plant. An Unusual Event should be declared based on a confirmed seismic event. Main Steam Line Radiation Monitors begin to gradually increase resulting in a Hi Rad Annunciator approximately 30 minutes into the drill. Forty-five minutes into the drill, a leak developed on the CSW Header in NRHR and the Vital Header near the RHR room coolers. Maintenance personnel will attempt to place a soft patch on both leaks. The CSW Header will not be patched prior to the pipe rupturing. The break will occur at approximately 1000 resulting in flooding the NRHR Room with 8' of water. This will result in a reactor scram, Group I isolation, loss of circulating water pumps, and loss of condenser vacuum. This flood will effect A and C RHR pumps and both CRD pumps.

An Alert will be declared based on a loss of decay heat removal capability (loss of RHR and condenser).

At 1015, an individual is injured while working at the low level warehouse. This individual will be contaminated. Southport Rescue Squad will respond to the site.

Reactor level is currently being maintained by RCIC.

At approximately 1115, a second seismic event is felt. Indications of a small break LOCA and a fault with E-2 are received in the Control Room. A Site Area Emergency should be declared based on a loss of two out of three fission product barriers. HPCI injects but fails at 1125 leaving RCiC available for makeup. Reactor level and pressure steadily fall with Core Spray "A" starting at approximately 350 lbs.

A line break occurs on the "A" loop of core spray inside the drywell. With no substantial means of coolant injection, water level quickly falls below the top of the core.

A General Emergency should be declared based on the inability to provide makeup. Significant fuel damage occurs. At approximately 1245, the EOPs direct the Control Room to vent irrespective of rad release as a result of potentially explosive levels of hydrogen and oxygen in containment.

Repairing E-2 will allow the containment vent valves to operate. Core Spray pump "B" will be available at approximately 1400 following a repair of the E21-F005 valve. This allows Operations to reflood and terminate the drill.

The on-site portion of the scenario will be completed by approximately 1400. In order to drive the ingestion pathway table top on June 3, 1992, (state participation only), additional failures will lead to a second core uncover and release at approximately 2000 on June 2, 1992.

ANNUAL EMERGENCY PREPAREDNESS EXERCISE
JUNE 2, 1992

	Event Classification	Seismic Event	Diesel E-2	Flood	LOCA
0900	Unusual Event	.07g Earthquake			
			<u>Relief Valve</u>		
		MSL Rad <u>High</u>			
1000	Alert			<u>CSW Leak</u> NRHR Flooded	
		<u>45 μci/ml</u> Injury			
1100					
	<u>Site Emergency</u>	<u>Earthquake</u>	<u>E2 Lost</u>		<u>LOCA</u> <u>HPCI Lost</u>
1200					
	<u>General Emergency</u>				A Loop Core <u>Spray Break</u>
			<u>E-2 Repaired</u>		<u>Vent due to</u> <u>H₂O₂</u>
1300					
1400	Terminate				
1500					

BRUNSWICK EMERGENCY PREPAREDNESS EXERCISE REPORT

Chronology:

0900 Seismic event; loss of #2 diesel generator; offsite feeder

0915 NOUE - due to confirmed seismic event

0928 Security directed to secure TSC

0932 High main steam line radiation alarm

0936 E&RC directed to get off-gas sample

0954 TSC included in protected area

1001 Conventional Service Water rupture

1006 ALERT - loss of RHR and condenser vacuum

1016 Injured man reported

1023 OSC activated

1041 TSC activated; Bob Helme became Site Emergency Coordinator

1043 Plant Ops Director identifies three missions

- Evaluate #2 DG failure
- Identify leak in service water and method to drain NRHR
- Evaluate 4B valve

1045 Mission identified to provide temporary air supply

1053 Plant Ops Director requests technical assessment ADS and HPCI switches

1100 Mission #5 to investigate RHR flooding as number one priority

1107 Plants Ops Director reports that in 5 hours depressurization will be required due to lack of suppression pool cooling

1115 Technical Assessment reports that it will take 30 minutes to develop a list of HPCI wires to be lifted

1119 Second seismic event reported from Control Room; E-2 bus lost

BRUNSWICK EMERGENCY PREPAREDNESS EXERCISE REPORT

- 1126 TSC status briefing
- LOCA in progress
 - RCIC injecting
 - HPCI failed
 - Magnitude of seismic event < SAE
 - Drywell pressure increasing
- 1130 SAE - loss of two barriers
- 1137 TSC establishes restoring service air as number one priority
- 1140 County requesting estimate of time when drywell is to be vented
- 1146 Problem with restoring service air
- 1149 Reactor water level at 90 inches
- 1152 Slight release in progress
- 1153 Team out on E-2
- 1155 Team goes out on #2 DG
- 1157 State requests information regarding core uncover
- 1158 Accountability reported completed
- 1210 Technical Assessment estimates level will reach top of active fuel within 15 to 30 minutes
- 1215 Reactor water level at a minus 90 inches
- Team #9 goes out to open valves 73, 75 and SW 105
- 1217 GE - level below active fuel - less than minus 90 inches
- 1219 A Core Spray Pump not injecting
- 1221 Recommendation goes out to shelter all zones
- 1225 TSC status
- SLC and Core Spray injecting
 - Rx level decreasing
 - Hydrogen level 4.8%
 - Power to E-2 required for venting
- 1226 Message #6 goes out with PAR

BRUNSWICK EMERGENCY PREPAREDNESS EXERCISE REPORT

- 1227 Bus fault on E-2
- County evacuating appropriate schools
- 1230 Hydrogen level at 7%
- 1241 Bus E-2 restored
- 1243 Injecting with B Core Spray
- 1245 TSC reports intent to vent through suppression chamber
Valve VF005B failed to operate - core spray not injecting
Mission requested to investigate valve 5B
- 1246 State and County personnel arrive in EOF after having
been briefed by the Assistant ERM
- 1247 Reactor level "out of sight"
- 1250 Dose projection made on hypothetical basis based on
complete drywell curie content release within hour
- 1253 Report received that counties, supported by the state,
had accepted utility PAR
- 1255 Venting is actually through the torus
- 1257 Venting started via drywell
- 1304 Message #7 goes out giving projected thyroid doses of
from 106 Rem at site boundary to 1.8 Rem at 10 mile
radius
- 1311 TSC dose projection
- Thyroid 28.5 Rem at site boundary
 - Whole body 36 mrem at site boundary
- Core damage
- 10% clad failure
 - 1% fuel inventory released into RCS
- 1320 DSC directed to send Mission 12 to fix Valve 5B
- 1322 Field survey teams reports 5 mr/hr at railroad
Hypothetical release based on 1800 R/hr in the drywell
calculated as thyroid dose of 938 R at site boundary to
16 R at 10 miles.
- 1330 Temporary service air connected

BRUNSWICK EMERGENCY PREPAREDNESS EXERCISE REPORT

1348 Purge in progress
1350 Mission 12 dispatched
1404 Mission 10 dispatched
1413 Valve 5B is opened; core spray injecting
1415 40R/hr at CST suction valve
1420 CSW problem being worked on by Outage Management as
directed by Technical Analysis Manager in the EOF - TSC
personnel were not aware of this request
1425 Water level is at the top of active fuel
1430 Mission 10 aborted
Exercise terminated