



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
REGION II  
101 MARIETTA STREET, N.W., SUITE 2900  
ATLANTA, GEORGIA 30323-0199

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Report Nos.: 50-335/94-04 and 50-389/94-04

Licensee: Florida Power and Light Company  
9250 West Flagler Street  
Miami, FL 33102

Docket Nos.: 50-335 and 50-389

License Nos.: DPR-67, and NPF-16

Facility Name: St. Lucie 1 and 2

Inspection Conducted: February 7-11, 1994

Inspector:

F. N. Wright, Team Leader

March 1, 1994  
Date Signed

Team Members: L. Cohen

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W. Sartor

Approved by:

K. P. Barr, Chief  
Emergency Preparedness Section  
Radiological Protection and Emergency Preparedness Branch  
Division of Radiation Safety and Safeguards

3/3/94  
Date Signed

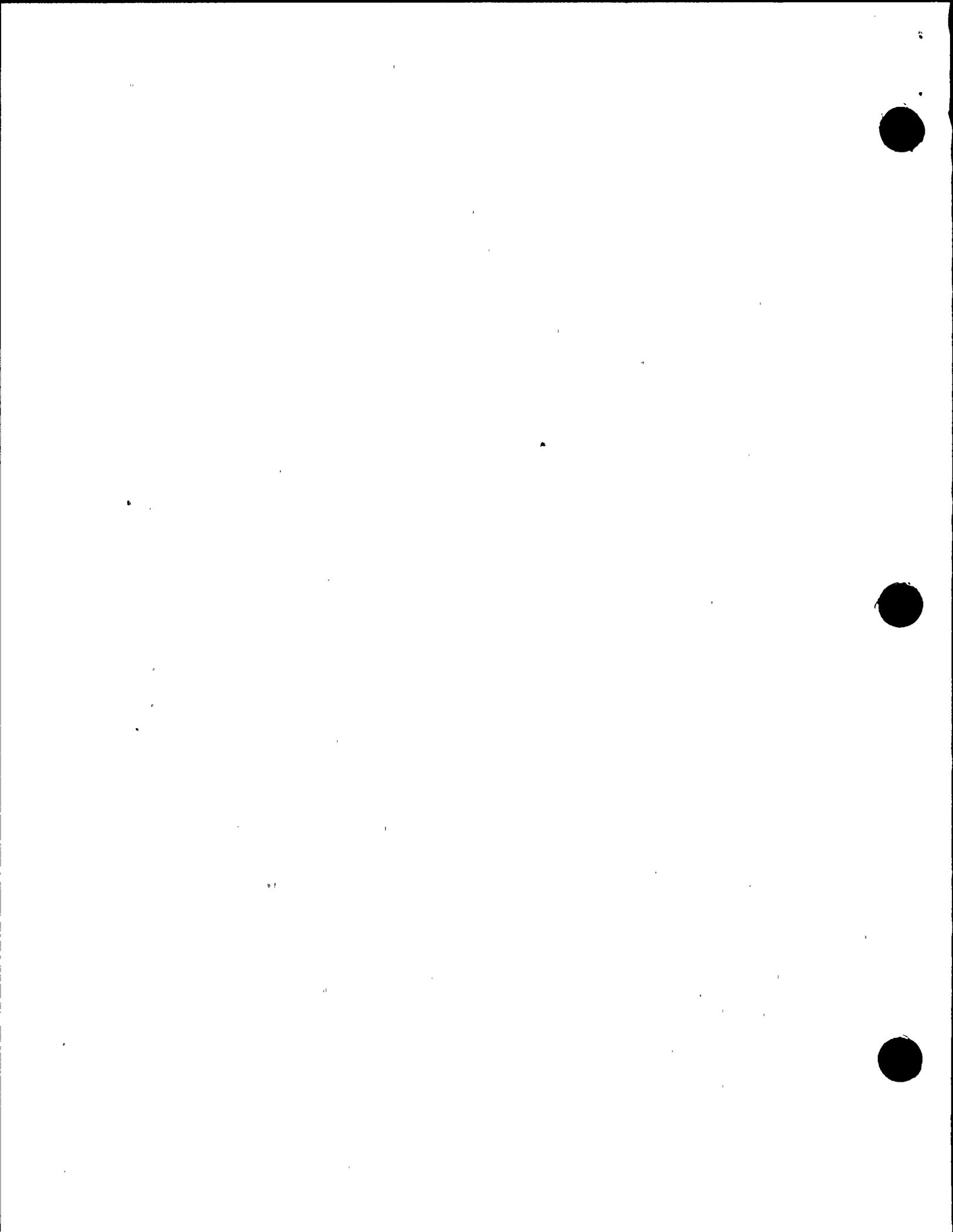
### SUMMARY

#### Scope:

This routine, announced inspection involved the observation and evaluation of the annual emergency preparedness exercise. Emergency organization activation and response were selectively observed in the Simulator Control Room; Technical Support Center; Operations Support Center; News Center; and Emergency Operations Facility. This one day full participation exercise was conducted on February 9, 1994, between the hours of 7:00 a.m. and 3:00 p.m.

#### Results:

In the areas inspected, no violations, deviations, or exercise weaknesses were identified. The licensee demonstrated the ability to identify initiating conditions, determine Emergency Action Level (EAL) parameters and correctly classify the emergency throughout the exercise. Two Inspector Followup Items (IFIs) were identified to: 1) Review licensee Emergency Plan implementing



procedures (EIPs) and training concerning the definition of containment failure as it relates to emergency classifications and protective action recommendations (PARs) (Paragraph 10); and 2) Observe a site accountability drill in 1994 (Paragraph 10).

Overall the licensee's performance during the exercise was good, with the licensee meeting most exercise objectives and demonstrating a capability to implement the Emergency Plan and its implementing procedures in the event of a radiological emergency.

## REPORT DETAILS

### 1. Persons Contacted

#### Licensee Employees

- \*T. Ashley, Master Radiological Controller
- \*G. Boissy, Plant General Manager
- \*T. Bolander, Reactor Operator Initial Training Instructor
- \*H. Buchanan, Health Physics Supervisor
- \*C. Burton, Plant General Manager
- \*G. Casto, Site Emergency Preparedness Coordinator
- \*R. Church, Safety Evaluation Group
- \*T. Coste, Operations Support Center Lead Controller
- \*J. Couture, Master Scenario Controller
- \*P. Fincher, Site Training Manager
- \*B. Frechette, Chemistry Supervisor
- \*M. Gilmore, Corporate Emergency Preparedness Specialist
- \*L. Heffelfinger, Protection Services Manager
- \*J. Holt, Licensing Region II Interface
- \*D. Huey, Nuclear Assurance
- \*A. Kimpel, Training
- R. McCullers, Health Physics Operations Supervisor
- \*L. McLaughlin, Licensing Manager
- H. Mercer, Health Physics Technical Supervisor
- \*D. Mothena, Manager, Nuclear Emergency Preparedness
- \*B. Parks, Quality Assurance Support Services
- \*C. Pell, Services Manager
- \*P. Plantz, Security
- \*W. Sager, Plant Vice President
- \*J. Scarola, Operations Manager
- \*C. Scott, Outage Manager
- \*S. Snodgrass, Emergency Preparedness Technician
- \*S. Valdes, Design Control Supervisor
- \*R. Walker, Site Emergency Preparedness Coordinator
- \*R. Weller, Nuclear Plant Supervisor
- \*J. West, Operations Supervisor
- \*D. Wolf, Engineering

Other licensee employees contacted during this inspection included engineers, operators, mechanics, security force members, technicians, and administrative personnel.

#### Nuclear Regulatory Commission

- S. Elrod, Senior Resident Inspector
- \*T. Johnson, Acting Senior Resident Inspector

\*Attended exit interview

Abbreviations used throughout this report are defined in the last paragraph.

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 the onsite and offsite emergency organizations of the licensee.

The licensee's exercise scenario staff utilized a drill control center to implement and monitor scenario activities. It was the licensee's first drill control center with continuous radio and telephone communications for the scenario control organization. Exercise controllers reported the center had permitted more efficient and effective scenario control.

Players were provided continuous plant parameters through the licensee's ERDADS. Scenario parameters via the system provided more realistic play and an opportunity for ERO personnel to become familiar with system displays and ERDADS capabilities. As a result, licensee staff determined, in the exercise critique process, that additional training and familiarization with the system was needed.

The exercise was expected to be complete at about 2:00 p.m. Exercise play was extended, approximately 40 minutes to provide the players an opportunity to identify the scenario's containment failure and to respond to protective measure concerns raised by offsite agencies. The scenario data generated by the simulator stopped prior to exercise termination and was manually generated by the controllers the last hour of the exercise.

In general, the controllers provided adequate guidance throughout the exercise. The inspector observed adequate interactions between the controllers and the players, no controller prompting was observed. Inspector noted that players worked hard throughout the simulated emergency to implement the Emergency Plan and its implementing procedures.

No violations or deviations were identified.

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

The area of assignment of responsibility was observed to determine whether 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.

During pre-exercise reviews of the licensee's Emergency Plan and implementing procedures; the inspector concluded that the onsite and offsite emergency organizations were adequately described, the emergency responsibilities of the various supporting organizations had been specifically established and key emergency response organization positions were clearly defined in approved plans and implementing procedures. The inspector observed that adequate personnel were available to respond to the simulated emergency.

No violations or deviations were identified.

4. Onsite Emergency Organization, (82301)

Implementation of the licensee's onsite emergency organization was observed to determine whether 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.

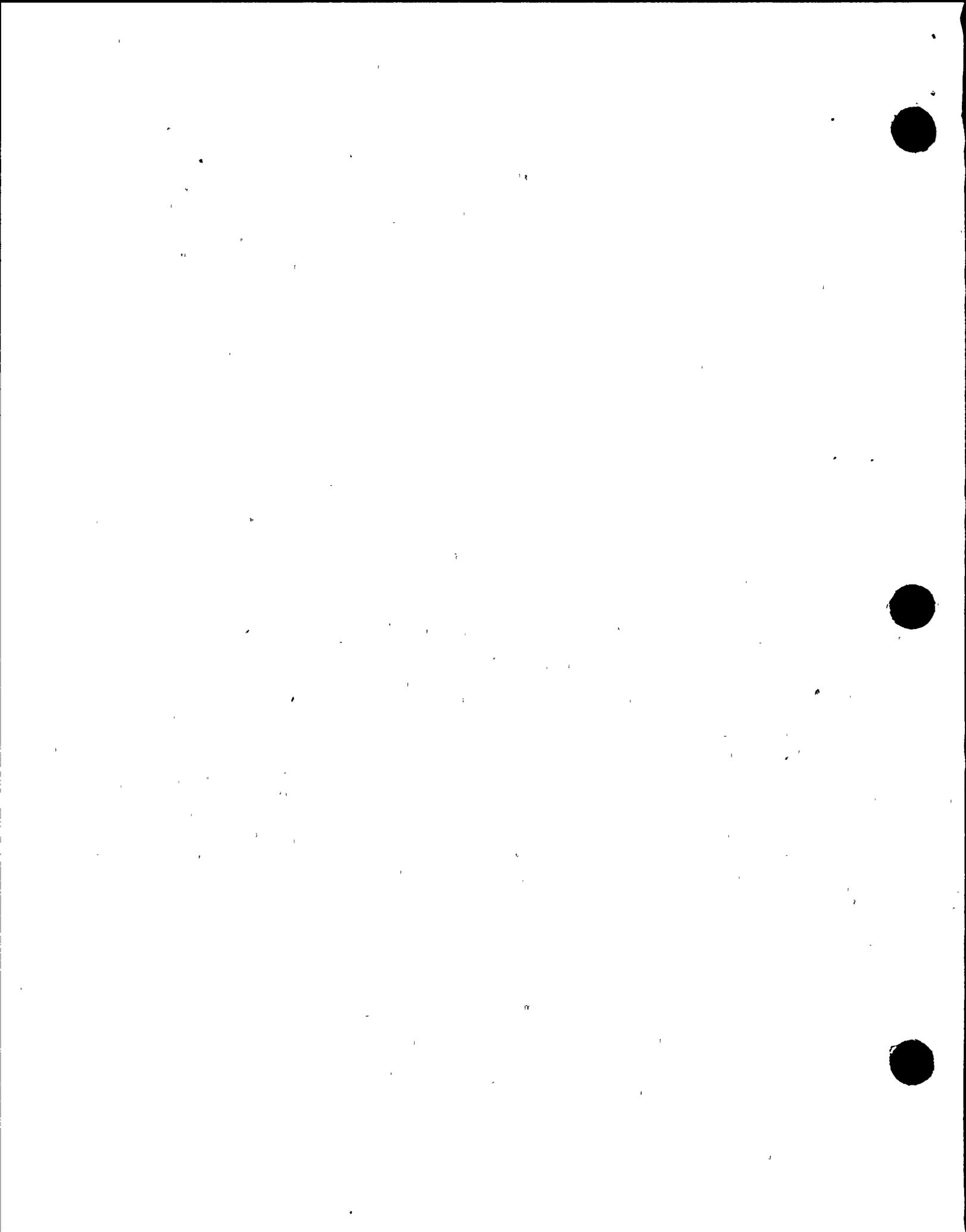
The inspector observed that the initial onsite emergency organization was adequately defined; the responsibility and authority for directing actions necessary to respond to the emergency were clear; that staff were available to fill key functional positions within the organization; and that onsite and offsite interactions and responsibilities were clearly defined.

The licensee adequately demonstrated the ability to alert, notify, and mobilize FPL 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. The inspector observed the activation, staffing, and operation of the emergency organizations in the ERFs and determined that the licensee was able to staff and activate the facilities in a timely manner.

No violations or deviations were identified.

5. Emergency Classification System, (82301)

The emergency classification system 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.



Licensee procedure EPIP-310022E titled "Classification of Emergencies" was used to promptly identify and properly classify the scenario simulated events.

The following classifications were made during the exercise:

- The NOUE was declared at about 8:14 a.m. on the basis of RCS water inventory balance indicating greater than 1 gpm unidentified leakage.
- The Alert was declared at about 9:05 a.m. as a precautionary measure due to step increase in RCS leakage to about 15 gpm and degrading plant conditions.
- The SAE was declared at about 10:04 a.m. on the basis of a LOCA greater than charging pump capacity (132 gpm).
- A General Emergency was declared at about 11:10 a.m. in accordance with EAL 6.A. "Emergency Coordinators judgement that plant conditions exist that make release of large amounts of radioactivity in a short period appear possible or likely (Any core melt situation)."

In general, the NPS/EC in the SCR and the EC in the TSC effectively evaluated existing conditions and declared appropriate emergency classifications in accordance with approved procedures in a timely manner.

No violations or deviations were identified.

#### 6. Notification Methods and Procedures (82301)

The Notification Methods and Procedures 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 follow-up messages to response organizations was 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.

Notification Objective B.3. was to "Demonstrate the capability to promptly notify U.S. NRC, State and Local Authorities of an emergency declaration or change in emergency classification."

A review of notification messages to Federal, State, and local agencies was made to determine that completed notification forms to offsite authorities contained the following information; emergency conditions, emergency classifications, radioactivity release status potentially affected population, projected population doses, recommended protective actions, and any changes to these conditions.

During the 1994 exercise, licensee personnel issued timely initial and follow-up notifications that, for the most part, accurately described site emergency conditions.

The inspector noted that the "State of Florida Notification Message Form For Nuclear Power Plants" did not have a dedicated space for a review signature. The inspector discussed the merits of ensuring information reported to offsite agencies was correct and appropriate. In accordance with licensee's Emergency Plan, the EC had the responsibility to ensure the notifications were made in accordance with the requirements and in a timely manner. Having the EC review and approve notifications messages provides an administrative control that can assist the EC in ensuring appropriate notification are occurring in accordance with the requirements. The licensee representatives acknowledged the inspectors comments but did not plan any changes in the emergency notification procedures.

The licensee also documented notifications made and simulated to the NRC Operations Center from the SCR and TSC. However, the initial report by the licensee to the HOO following the activation of the EOF was not documented. The inspector determined that the licensee's EOF procedures did not have or utilize a document for notifying the NRC following activation of the EOF. The inspector discussed, with the site's EP Coordinators; the importance of ensuring timely and accurate notifications were made in accordance with reporting requirements. The EP Coordinators reported that the licensee anticipated continuous communication with the NRC upon any EOF activation and the NRC notification form would not be needed or utilized in such conditions. The inspector left the issue as a opportunity for the licensee to improve controls on the NRC reporting process.

No violations or deviations were identified.

#### 7. Emergency Communications (82301)

The Emergency Communications area was observed to determine whether 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.

In general, the inspector observed that adequate communications existed among the licensee's emergency organizations and between the licensee's emergency response organization and offsite authorities. The State of Florida and local counties had representatives in the EOF which helped facilitate good communications between the licensee and those agencies.

Radio communications between the Field Monitoring Teams and TSC and EOF were adequate to dispatch and direct field team activities. However there was one transmitter failure for a field monitoring team that required licensee attention during the exercise. Communications with emergency repair teams out of the OSC were made with radios and plant



paging system. The licensee did not have enough radios to provide every repair team a portable radio, but the limited radio supply did not significantly affect team response or safety. In the licensee's critique process, personnel reported that there appeared to be some "dead spots" with radios used in the OSC which players were able to work around. Overall, the licensee demonstrated the adequacy, operability and effective use of emergency communications equipment.

No violations or deviations were identified.

8. Emergency Facilities and Equipment (82301)

The Emergency Facilities and Equipment area was observed to determine whether adequate emergency facilities and equipment to support an emergency response were 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.

The inspector observed the activation, staffing and operation of key ERFs, including the SCR, TSC, OSC, EOF, and ENC.

a. Simulator Control Room

The NPS/EC demonstrated good command and control throughout the exercise. Classifications and notifications were accomplished efficiently and in a timely manner. The NPS correctly classified the emergency and notified appropriate State and local agencies within 15 minutes. The NPS and the reactor operators demonstrated good use of the EIPs throughout the exercise. The NPS/EC referred to the classification procedure often, when conditions changed, to determine the possibility of reclassification. The crew demonstrated a solid understanding of plant systems. Overall, operations personnel adequately assessed the problems faced during the exercise.

The transfer of EC responsibility to the TSC was accomplished efficiently. An adequate complete and accurate turnover of information was performed at the time of the transfer and the time used to perform the transfer was kept to a minimum.

Operations personnel maintained good communications with the ERFs and kept management well informed of changing plant conditions. Communication between the SCR and the TSC was quickly established and constantly maintained. In general, the exchange of information was performed accurately, concisely and in a most professional manner.

No violations or deviations were identified.



b. Technical Support Center

The inspector observed the initial activation and personnel response in the staffing of the TSC. The NPS declared an Alert emergency classification at about 9:05 a.m. and requested activation of the TSC and OSC. The onsite ERO staff was alerted to the Alert emergency classification and instructed to report to their assigned ERFs. A message to report to the facilities was made over the plant's PA system at about 9:07 a.m. The TSC was activated and declared operational at 9:28 a.m. by the TSC Supervisor after key ERO personnel had reported to the TSC. The TSC was activated, fully staffed, and functional in a timely manner.

The facility personnel appeared to be cognizant of their emergency duties and responsibilities and conducted their responsibilities in a professional and organized manner. Command and control in the TSC was excellent. The EC's routine briefings were informative. Congestion and noise levels were kept to a minimum.

All primary communication systems were functionally properly. The status boards were frequently updated and adequately maintained throughout the exercise. Simulated plant data via the plant simulator and ERDADS plant parameter system provided real time information for the TSC staff. In general, communication and information flow in the TSC was accurate and timely.

The licensee demonstrated the functional and operational adequacy of the TSC. The facility layout provided for good interface between the EC and his staff.

No violations or deviations were identified.

c. Operational Support Center

The inspector observed the initial staffing and activation of the OSC. Upon the direction by the EC, the OSC was activated in a timely manner. An Alert was declared at 9:05 a.m. The licensee declared the OSC operational at 9:22 a.m. after completing EPIP-3100032E, "On-Site Support Centers," Appendix D, "Operational Support Center Activation Checklist."

In general communications in the OSC and with the TSC were good. Command and control in the OSC was excellent. The OSC Manager gave frequent status briefings to OSC personnel addressing plant conditions, radiological conditions, and the plant's emergency status. Event and ERT status boards were routinely updated. The interface between the OSC Manager and the EC was handled through an OSC Communicator. This freed up the OSC Manager and still maintained good communication with the TSC throughout the exercise. Congestion and noise were kept to a minimum.

In 1994, an SRO Operations position was added in the OSC. The inspector noted that the addition of an SRO in the OSC aided in discussions concerning TSC's requested tasks. Also, the SRO's operations background allowed the OSC to pre-plan repair team in anticipation of TSC request.

HP personnel anticipated probable contamination, and started early on to take precautions to prevent contamination of the OSC. Step-off pads and/or manned frisking stations, were established to prevent the spread of contaminants into clean areas. Radiation and contamination surveys were made and portable monitors were set up in the OSC to insure that the environment was free of radioactive contaminants.

Emergency Response Exercise Objective C. 13. was to "Demonstrate the ability of the OSC to assembly, dispatch and control ERTs in a timely manner."

During the exercise, the OSC was well manned and the availability of repair personnel was good. The inspector observed that the OSC status boards only identified the priority 1 team, and did not identify priorities for other teams. The inspectors observation was discussed with the licensee. The licensee stated that given the available repair personnel, that the priority 1 team was identified, and there were only two critical tasks they did not feel the need to list priorities other than the number 1 priority. The inspector agreed.

ERTs were briefed on potential radiological conditions and protective measures including personnel dose reduction practices prior to departing the OSC. Communication with the teams was maintained with the use of portable radios. Radiological conditions were monitored by HP technicians who accompanied teams.

The inspector observed 12 ERTs dispatched from the OSC. The OSC Manager maintained a good awareness of ERT activities and continuously inquired about the status and whereabouts of the ERTs. During the exercise, the inspector determined the OSC could not immediately identify all of the members of each ERT in the event of a local emergency. The inspector reviewed the licensee's ERT control procedures and determined that when a task was requested from the TSC, the team was formed using Appendix C, "Re-Entry Team Request Form" from EPIP-3100027E. This form was analogous to a "Work Request." The form listed: The reason for the request; Team number; Task description; and Team members. By procedure, the team took the form with them to the Emergency Access Control Point. In addition to the Appendix C "Re-Entry Team Request Form," HP completed a HP 203.1, "Evacuated Area Re-Entry Authorization" for the team and was analogous to an "RWP." The HP 203.1 form did not clearly correspond with the Appendix C, "Re-Entry Team Request Form." The inspector verified that if necessary, the licensee could use the access control point

log and the HP 203.1 Form, to identify individual members of a particular team. This concern of not having the names of members of a particular team readily available was discussed with the licensee. The licensee recognized and acknowledged the need to have better control of ERT personnel accountability during emergency conditions. The licensee planned to review the ERT control process for improved personnel accountability.

No violations or deviations were identified.

d. Emergency Operations Facility

The licensee's EPIP-3100021E provided instructions for the EC when the REP was implemented. The procedure requires the EC complete an emergency classification checklist corresponding to the event classification. One of the checklist items requires the EC notify the Nuclear Division Duty Officer and relay information on the State and local notification form. The NDDO was required to implement the requirements of the licensee EPIP 1101, "Duties of the Emergency Control Officer, Offsite Emergency Organization." As described in the EPIP 1101 procedure, the NDDO was responsible to "...activate the offsite emergency organization to the extent he deems necessary to provide assistance to the plant in administration, public relations, security, engineering, and technical matters." Licensee procedures allowed for the activation of the EOF at an Alert emergency classification. The ECO had the responsibility to notify and initiate the mobilization of the offsite ERO and was responsible for all offsite organizational duties prior to EOF activation. The EOF was promptly staffed and activated with qualified personnel. The minimum EOF staff for activation was in the EOF at approximately 9:56 a.m. The EOF staff awaited the completion of the site's offsite notifications following the declaration of a Site Area Emergency classification made at 10:04 a.m. Emergency response responsibilities were transferred to the EOF in a timely manner when the facility became operational at 10:28 a.m. It took the licensee 69 minutes to activate the EOF following notification of the initial responders at about 9:19 a.m. The licensee's response was significantly improved over previous exercises.

The Recovery Manager demonstrated good command and control, appeared knowledgeable of his duties and responsibilities, and assumed the responsibility in a professional and organized manner.

EOF staff communicated frequently with each other and with offsite authorities. All primary communication systems were functioning properly. Communications with the State and local agencies was excellent since their representatives were located in the EOF. Congestion and noise levels were kept to a minimum. The Recovery Manager provided timely and accurate status updates to the EOF staff.

The EOF was well equipped with status boards and computer information systems. Space was sufficient to allow the staff to perform their duties.

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. Local newspaper, radio and television stations also participated in the exercise and their participation in the exercise was excellent. The inspector observed the preparation of news releases and the preparation of material for briefings. News releases were accurate, timely and presented in manner that could be understood by the public. Licensee participants conducting briefings appeared qualified and prepared to periodically brief and answer questions of the media. The facilities for utility, state, local, and NRC representatives were excellent but small. No problems with the licensee's media presentations were identified.

No violations or deviations were identified.

9. Accident Assessment (82301)

The Accident Assessment 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 both onsite and offsite personnel resulting from the accident. Both programs appear effective during this exercise on analyzing the plant status so as to make recommendations to the EC concerning mitigating actions to reduce damage to plant equipment, to prevent release of radioactive materials, and to terminate the emergency condition.

Onsite engineering assessments were pursued aggressively to mitigate the consequences of the scenario accident conditions.

Exercise Scenario Objective D.2 required the dose assessment team to "Demonstrate the capability to calculate radiological release dose projections and perform timely and accurate dose assessment as appropriate."

The inspector observed the licensee's radiological assessment activities onsite and offsite. The plant staff was effective in evaluating radiological conditions and providing protective measures for onsite ERO personnel. Onsite and offsite radiological monitoring teams were dispatched to determine the level of radioactivity in those areas within the path of the simulated plume. The field monitoring teams effectively demonstrated their capability to collect those data points and relay those data to the emergency response facilities. Licensee dose assessors onsite in the TSC and offsite in the EOF effectively utilized plant parameters, radiological monitoring equipment, sample results and meteorological data to project offsite dose rates and doses to the population within the plume path. All resultant data were consistent with projected scenario data. There was general agreement between calculated projections and offsite monitoring results.

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 Protective Responses 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 EPZ.

The scenario called for a large break LOCA at about 10:00 a.m. At about 10:04 a.m., a SAE was declared for a LOCA greater than charging pump capacity. At about 11:00 a.m., a Recirculation Actuation Signal occurred. The 2B LPSI pump tripped and would not restart. A containment sump piping leak occurred allowing sump water to be released into the SI pipe tunnel and the Unit 2 RAB basement. Radioactivity from the leak was picked up by the running 2B ECCS ventilation system and transported to the environment through the 2B ECCS vent stack on the Unit 2 RAB roof.

A General Emergency was declared at about 11:10 a. m. on EAL 6.A. "Emergency Coordinators judgement that plant conditions exist that make release of large amounts of radioactivity in a short period appear possible or likely (Any core melt situation)."



The procedures for determining PARs were described in licensee procedures EPIP-3100021E, "Duties And Responsibilities Of The Emergency Coordinator" and EPIP-1102, "Duties Of The Recovery Manager." The procedures contained flow charts for determining the appropriate PARs based on plant conditions or radiological releases. The initial PAR was selected prior to any offsite dose projections and was determined by status of plant conditions. The initial PAR was made by the Recovery Manager in the EOF. The initial PAR was: Evacuate all sectors out to two miles, evacuate downwind sectors out to five miles and shelter remaining sectors out to ten miles.

As the reactor vessel drained down and uncovered the core fuel damage began. Scenario developers anticipated the EC would declare a General Emergency based upon verified fuel damage with LOCA and loss of containment integrity. PARs would be generated based upon plant conditions. The scenario developers anticipated the following PAR: Evacuate all sectors out to five miles and shelter remaining sectors out to 10 miles.

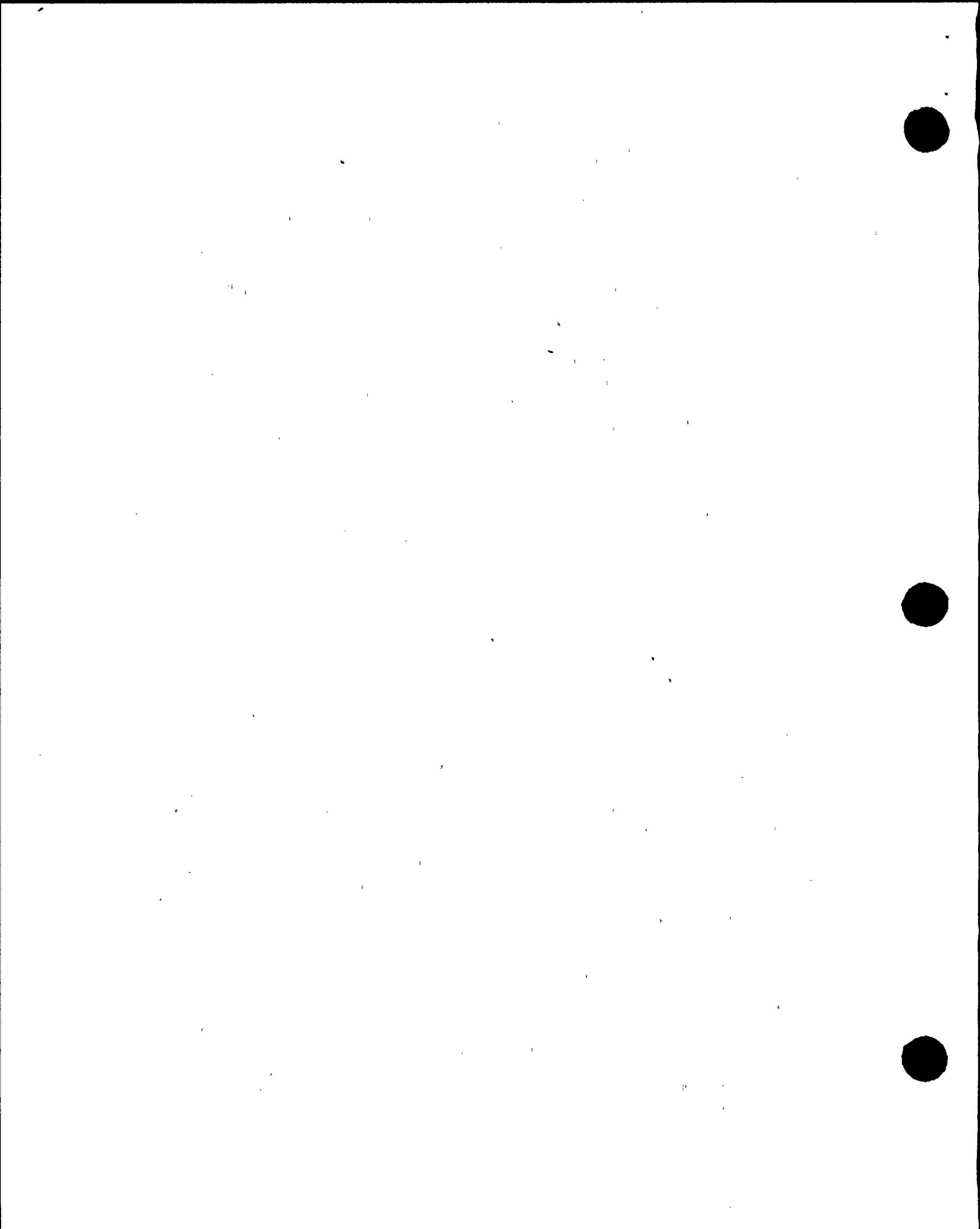
The difference between the two PARs were the anticipated PARs would have caused the evacuation of all sectors out to five miles verses evacuation of only the downwind sectors out to five miles.

During the exercise, licensee management failed to identify the path of the radiological release as containment failure. Scenario developers believed that the conditions planned in the scenario, to generate a simulated radiological release, would result in the ERO identifying containment failure. However, ERO personnel did not believe containment failure had occurred. The staff believed the source of the release was due to damaged equipment in the Auxiliary Building. Since containment failure was not identified by the ERO, one of the PARs anticipated by the scenario developers was not issued.

The inspector determined through interviews with licensee personnel and review of procedures that the definition of containment failure was not clearly defined or understood by the licensee's staff. The licensee recognized the need to better define containment failure as it relates to classification and protective action decision processes. The inspector stated that a review of licensee corrective actions concerning the definition and use of containment failure in licensee emergency procedures and any needed training on the issue would be reviewed in a future inspection as an IFI.

IFI 50-335, 389/94-04-01: Review licensee emergency plan implementing procedures and training concerning the definition of containment failure as it relates to emergency classifications and PARs.

All dose projections made during the exercise were based on a release of at least two hours. During the exercise, the exact source of the radiological release was not known. The general area of the release was known to be within an area vented by the ECCS ventilation system, however, dose rates prohibited direct inspection of equipment and



facilities near the source of the release. Since the source of the release was not known it was difficult for the licensee to determine when the release would be stopped. At about 1:45 p.m., offsite agencies inquired about possible offsite doses to the community and the need for any additional PARs if the release continued. Specifically the offsite agencies wanted to know when offsite doses might reach a level in which evacuations of their populations would be recommended. The licensee was not able to immediately report projected doses beyond the next two hour period when asked. At that time, offsite agencies were considering the need to proceed with additional evacuations. The offsite agencies were concerned that they might be forced to initiate population evacuations after dark if the radiological release continued and evacuations were ordered later in the event. At about that time the release rates began decreasing and a few minutes later the exercise was terminated by the controllers at about 2:38 p.m. Following the exercise, the inspector discussed the licensee's dose projections with members of the licensee's staff. There did not seem to be an awareness by the licensee's staff of the need to project doses for periods greater than two hours. The inspector noted that dose projections utilizing a release period greater than the next two hours was very appropriate for a condition in which ability to control the release had not been determined or obtained. The inspector stated that additional procedural guidance for performing offsite dose projections appeared appropriate.

The inspector determined that the licensee had not conducted a site accountability drill within the past five years. The last accountability drill was performed in 1989. The inspector determined from the plant EPC that the licensee had planned to conduct a site accountability drill in 1994. The inspector reported to licensee management that the Region II staff was interested in reviewing the proposed accountability drill and requested the licensee provide the staff with a proposed drill date. The inspector reported to the licensee that the observation of a site accountability drill would be made an IFI.

IFI 50-335, 389/94-04-02: NRC observation of a site accountability drill in 1994.

No violations or deviations were identified.

11. Radiological Exposure Control (82301)

This area was observed to determine that means for controlling radiological exposures, in an emergency, are established and implemented for emergency workers and that they include exposure guidelines consistent with EPA recommendations as required by 10 CFR 50.47(b)(11), and specific criteria in NUREG-0654, Section II.K.

Licensee procedures required that the station provide and distribute dosimeters to emergency response personnel. In addition, dose records were required to be maintained throughout the emergency. The inspector noted that emergency response personnel in the ERFs were issued

radiation monitoring devices and control of personnel radiological exposures for teams out of the OSC was good. The inspector noted that the licensee established radiological control points as needed and habitability was confirmed and periodically assessed by radiation protection personnel.

No violations or deviations were identified.

12. 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 critiques with exercise players following the exercise termination. Licensee controllers and observers conducted additional critiques prior to the formal critique to management on February 11, 1994. Issues identified by the licensee's staff during the exercise were discussed by licensee representatives during the formal exercise critique to licensee management. The licensee's critique addressed both substantive deficiencies and improvement areas. The conduct of the critique was adequate.

No violations or deviations were identified.

13. Licensee Action on Previously Identified Inspection Findings

- a. (Closed) IFI 50-335, 389/92-01-02: Calculating radiological release dose projections.

In the 1992 annual Emergency Preparedness exercise inspectors determined that the TSC dose assessment team did not provide useful or timely dose projection estimates to the EC. During the 1992 exercise both the TSC and EOF dose assessors had responsibilities to performed offsite dose assessments. The TSC dose assessors were responsible for making all offsite dose assessments until the EOF was activated. Once the EOF was operational it acquired the responsibilities for calculating dose projections for any release and the TSC dose projection staff's responsibility was to perform parallel calculations to validate the EOF staff's calculations. A simulated radiological release began after the TSC and EOF facilities were both activated. The TSC dose assessors completed calculations about 22 minutes after the EOF dose assessors had completed their calculations.

The inspector learned that the TSC dose assessor had keyed in a wrong value into a computer program that had cause a different dose projection estimate than that determined by the EOF. The dose assessor decided to recalculate the dose calculations which caused a delay. Following the exercise the inspector discussed

the dose assessment delay with licensee representatives. The licensee agreed to review the event to determine the need for additional training or procedural guidance for the TSC dose assessors and the item was identified as an IFI. To address the problem the licensee developed a training brief to all Chemistry Department (dose assessors) personnel for review TB 9208167-S-01, "Off-Site Dose Calculations-Computer Method Training Brief." The brief provided procedures and guidance for using the computer bases process to derive calculated off-site doses in a manner similar to the procedure for manual calculation.

During the 1993 annual EP exercise, the inspector identified additional concerns with dose assessment activities. During the 1993 EP exercise dose assessors did not calculate release rate for a simulated release from containment. The dose assessors utilized a LOCA dose assessment program which used a design bases leakage rate for calculating offsite dose rates. The leak rate was much larger than a design base leak rate. Failure to calculate the release rate for the simulated conditions and factor it into the offsite dose programs resulted in an underestimate of offsite dose rates by about two to three orders of magnitude. To correct the problem identified in 1993 the licensee developed several methods to calculate a burp release and provided "Containment Leakage and Emergency Dose" training on the procedures to staff dose assessors. The inspector reviewed the licensee's procedures and subject training records concerning the issue. The licensee's actions appeared appropriate for improving dose assessment capabilities. The inspector stated that the item would be closed.

- b. (Closed) IFI 50-335, 389/93-16-01: Ensuring consistency of scenario technical data.

This issue concerned inconsistencies in scenario technical data during the 1993 EP exercise and licensee efforts to ensure the congruity of scenario data. In the 1993 exercise the offsite dose projections differed from the associated field monitoring values by two or three orders of magnitude.

To prevent a similar occurrence the licensee assembled a qualified scenario development team which spent more time verifying exercise data than in previous years.

Inspectors observed that the offsite dose rates measured by offsite field monitoring teams generally agreed with the offsite dose rates calculated by the dose assessment staff during the 1994 exercise. No other significant technical data issues were identified by the inspectors. The inspector stated that the item would be closed.

- c. (Closed) IFI 50-335, 389/93-16-02: Reviewing REP and EPIP guidance and requirements related to provision of periodic plant status updated to offsite authorities during an Alert or higher emergency classification.

This item concerned licensee's procedure and requirements for making periodic updates of emergency conditions to State and local agencies during an event. Licensee EPIP-3100031E, "Duties and Responsibilities of the Emergency Coordinator" specified that offsite authorities would be updated regarding any significant changes in plant conditions and that appropriate notification forms would be used for all updates. However, during the 1993 exercise the licensee failed to make a notification to offsite agencies that a plant shutdown was made following the Alert classification. State of Florida representatives in the EOF expressed concern that no updates had been provided to the State between the period of 4:12 a.m. and 6:25 a.m.

In accordance with NRC and industry guidance the licensee's REP required periodic updates. However the EIPs did not establish any fixed or variable time interval that would implement the commitment. Licensee management committed to review the applicable guidance and requirements, and to discuss the matter with State representatives, in order to ensure at a minimum that all parties clearly understand what was meant by "significant changes" in plant conditions.

The licensee discussed the periodic notification needs of the State with state representatives and revised EPIP-3100021E to require updates be provided, by notification forms, every 60 minutes or upon any "significant changes" in plant status. Several examples of "significant changes" were also included in the text of the procedure. The procedure allowed for changes in the frequency of updates following agreements by offsite authorities. The inspector stated that the item would be closed.

- d. (Closed) IFI 50-335, 389/93-16-03: Evaluating procedural requirements with respect to conveying information to offsite authorities regarding classifiable incidents of lesser severity occurring during an extant emergency classification.

The IFI concerned a statement in EPIP- 3100021E:

"If one unit is in a classification event and the same or the other unit enters into an event where the same or lesser emergency class would apply, a new classification should NOT be declared. The event should be issued as a update at the earliest practical time. No regulatory time limits would apply to the update."

The inspector reported that the last sentence in the procedure guidance referenced above did not appear to be appropriate guidance based upon any specific commitment or specification in the REP. Licensee management committed to evaluate the procedural guidance. The licensee removed the last sentence from the referenced guidance in revision 30 to EPIP-3100021E, dated September 28, 1993. The inspector stated that the item would be closed.

- e. (Closed) EW 50-335, 389/93-16-04: Failure to activate the EOF in a timely manner.

In the absence of any licensee criteria for timely activation of the EOF, the inspector used the guidance in Supplement 1 to NUREG-0737 to formulate acceptance criteria relative to the timeliness of EOF activation. The guidance specified that the EOF is to be staffed by a designated senior licensee manager and appropriate technical staff within one hour (item 8.4.1.1). The EOF was declared operational 109 minutes after the Alert declaration and an exercise weakness identified. In a letter to the NRC dated September 1, 1993, the licensee reported the following corrective actions:

- The current Recovery Manager Operations Advisors at St. Lucie have been trained to perform as the Interim Recovery Manager until one arrives at the EOF.
- The auto dialer will no longer be used in the "notify" mode for drills.
- An unannounced activation drill was conducted after normal working hours for the initial EOF responders on August 26, 1993.

The licensee's corrective action letter reported that, following the implementation of the above corrective actions, the EOF was staffed in 37 minutes of the decision to staff the facility. In the 1994 exercise, the decision to activate the EOF was made at about 9:15 a.m. following the declaration of an Alert emergency classification at 9:05 a.m. The EOF was minimally staffed by 9:56 a.m., approximately 41 minutes following decision to staff the EOF and 51 minutes following the Alert declaration. The EOF was activated following a turnover, from the EC in the TSC, at 10:28 a.m., approximately 73 minutes following the decision to activate the EOF with initial EOF responders. The inspector reported the observed response during the 1994 exercise was a significant emergency response program improvement and the item would be closed.

## 14. Federal Emergency Management Agency Report

A report on FEMA's evaluation of offsite preparedness will be issued at a later date and will be provided by a separate transmittal.

## 15. Exit Interview

The inspection scope and results were summarized on February 11, 1994, with those persons indicated in Paragraph 1. The inspector described the areas inspected and discussed in detail the inspection results listed below. Propriety information was not reviewed during the inspection. Dissenting comments were not received from the licensee. Licensee management was informed that five open item (listed in Paragraph 13) were reviewed and considered closed.

<u>Type</u>	<u>Item Number</u>	<u>Status</u>	<u>Description and Reference</u>
IFI	50-335, 389/94-04-01	Open	Review licensee EPIPs and training concerning the definition of containment failure as it relates to emergency classifications and PARs (Paragraph 10).
IFI	50-335, 389/94-04-02	Open	Observe a site accountability drill in 1994 (Paragraph 10):
IFI	50-335, 389/92-01-02	Closed	Calculating radiological release dose projections (Paragraph 13).
IFI	50-335, 389/93-16-01	Closed	Ensuring consistency of scenario technical data (Paragraph 13).
IFI	50-335, 389/93-16-02	Closed	Reviewing REP and EPIP guidance and requirements related to provision of periodic plant status updated to offsite authorities during an Alert or higher emergency classification (Paragraph 13).
IFI	50-335, 389/93-16-03	Closed	Evaluating procedural requirements with respect to conveying information to offsite authorities regarding classifiable incidents of lesser severity occurring during an extant emergency classification (Paragraph 13).

EW 50-335, 389/93-16-04 Closed Failure to activate the EOF in a timely manner (Paragraph 13).

16. Index of Abbreviations Used in this Report

CFR	Code of Federal Regulations
EAL	Emergency Action Level
EC	Emergency Coordinator
ECCS	Emergency Core Cooling System
ECO	Emergency Control Officer
EOF	Emergency Operations Facility
EP	Emergency Preparedness
EPIP	Emergency Plan Implementing Procedure
EPZ	Emergency Planning Zone
ERDADS	Emergency Response Data Acquisition and Display System
ERF	Emergency Response Facility
ERO	Emergency Response Organization
ERT	Emergency Response Team
EW	Exercise Weakness
FEMA	Federal Emergency Management Agency
FPL	Florida Power and Light
GPM	Gallons Per Minute
HOO	Headquarters Operations Officer
IFI	Inspector Follow-up Item
LOCA	Loss Of Coolant Accident
LPSI	Low Pressure Safety Injection
NDDO	Nuclear Division Duty Officer
NOUE	Notification Of Unusual Event
NPS	Nuclear Plant Supervisor
NRC	Nuclear Regulatory Commission
OSC	Operations Support Center
PA	Public Address
RAB	Reactor Auxiliary Building
RCS	Reactor Coolant System
RWP	Radiation Work Permit
SAE	Site Area Emergency
SCR	Simulator Control Room
SI	Safety Injection
SRO	Senior Reactor Operator
TSC	Technical Support Center

Attachments:  
 Exercise Objectives, Narrative  
 Summary, and Time Line

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**FLORIDA POWER AND LIGHT COMPANY  
ST. LUCIE NUCLEAR POWER PLANT  
1994 EMERGENCY PREPAREDNESS  
EVALUATED EXERCISE  
FEBRUARY 9, 1994**

**3.1 NARRATIVE SUMMARY**

The scenario begins with Unit 2 operating at 100% power. The 2B High Pressure Safety Injection (HPSI) pump is tagged out of service (OOS) for maintenance. A 5 gallon per minute (gpm) leak develops on a cold leg weld in the Unit 2 Reactor Coolant System (RCS) piping. This should produce a declaration of a Notification of Unusual Event (NUE). The RCS leak escalates to 65 gpm. This should produce a declaration of Alert and a down power on the reactor. During the reactor down power, when the in-house electrical loads are transferred to the Startup (S/U) Transformers (Xformers); the 2A3 4160 Volt (4.16 KV) bus will lock out on differential current when the "A" 4.16 KV S/U breaker is taken to close. The leaking cold leg weld fails, resulting in a shear break in the piping. This should produce a declaration of a Site Area Emergency (SAE). When the Recirculation Actuation Signal (RAS) occurs, the 2B Low Pressure Safety Injection (LPSI) pump shuts down and will not restart. The large break Loss of Coolant Accident (LOCA) with no Emergency Core Cooling System (ECCS) flow to the reactor vessel allows the reactor core to become uncovered and fuel damage results. A leak develops in the Containment sump piping allowing sump water to be released into the Safety Injection (SI) pipe tunnel and the Unit 2 Reactor Auxiliary Building (RAB) basement. The released activity is picked up by the running 2B ECCS ventilation system and transported to the environment through the 2B ECCS vent stack on the Unit 2 RAB roof. A General Emergency (GE) should be declared. The 2B LPSI and/or HPSI pump is restored and ECCS flow is initiated to the reactor. This will exacerbate the core damage and increase release to the Containment at first until rewetting and cooling of the core can take effect.

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FLORIDA POWER AND LIGHT COMPANY  
ST. LUCIE NUCLEAR POWER PLANT  
1994 EMERGENCY PREPAREDNESS  
EVALUATED EXERCISE  
FEBRUARY 9, 1994

3.2 SCENARIO TIMELINE

TIME	EVENT
0700	Player briefing, shift turnover and initial conditions establish Unit 2 operating at 100% power, in the middle of core life. Power history has been full power operation for the last 180 days. Unit 1 is in day 42 of a 45 day scheduled refueling outage. Demand on the system is moderate with an anticipated peak of 10,000 MW <sub>e</sub> . Service area conditions are normal. The 2B High Pressure Safety Injection (HPSI) pump is out of service (OOS) for outboard seal and bearing replacement. The 2B HPSI pump was placed on clearance at 1600 on February 8, 1994. The pump bearing and seal work continued on the previous peak and mid shifts. The completion of installation and testing is anticipated by the middle of the day. The Hot Ring-Down (HRD) and National Warning System (NAWAS) phone systems are both OOS in the Unit 2 Control Room (Simulator). Weather has been sunny and mild for the last week. Forecast is for clear skies, temperatures in the upper 70's. Current temperature is 75° with winds from the Northeast (45°) at 3-4 mph.
0715	Full Length Control Element Assembly (FLCEA) testing is begun on Unit 2 in accordance with Operating Procedure OP-2-0110050, <i>Control Element Assembly Periodic Exercise</i> .
0800	A 5 gallon per minute (gpm) leak begins from a faulty weld in the Reactor Coolant System (RCS) 2A1 Cold Leg. A NOTIFICATION OF UNUSUAL EVENT (NUE) should be declared based upon Emergency Plan Implementing Procedure (EPIP) 3100022E, <i>Classification of Emergencies</i> , greater than 1 gpm unidentified leakage. The Nuclear Plant Supervisor (NPS) should assume the duties of the Emergency Coordinator (EC).

3.2 SCENARIO TIMELINE (Continued)

TIME	EVENT
0805	Reactor Cavity Leakage alarm, Charging/Letdown mismatch, Reactor Cavity sump levels and Containment atmosphere indications are utilized to validate the RCS leakage. Operators should enter ONOP 2-0120031, <i>Excessive Reactor Coolant System Leakage</i> and perform a leak rate calculation using AP-2-0010125A, <i>Surveillance Items</i> , Data Sheet 1.
0815 (Approx.)	The Nuclear Plant Supervisor (NPS) may order a power Containment entry at this time to investigate the RCS leak. (Entry team activity will be allowed up to the point of actual Containment entry, which will be <i>simulated</i> .)
0830 (Approx.)	Contingency message for the Notification of Unusual Event declaration.
0845	<p>The RCS leakage increases to 65 gpm. Within minutes, Reactor Cavity Leak High goes off scale (12 gpm) as a result of the increased leakage. Containment pressure, temperature and radiation levels are increasing and RCS pressure and level are decreasing.</p> <p>An ALERT should be declared based upon Emergency Plan Implementing Procedure (EPIP) 3100022E, <i>Classification of Emergencies</i>, greater than 50 gpm leakage.</p> <p>The Technical Support Center (TSC) and Operations Support Center (OSC) should begin activation. The Emergency Operations Facility (EOF) should be staffed and activated by the initial responders. (The Emergency Control Officer (ECO) may fully activate the EOF at any time after this point if he deems it necessary.)</p> <p>Operators should begin a downpower at 10 MW<sub>e</sub>/min, enter OP-2-0030125, <i>Turbine Shutdown Full Load to Zero Load</i> and utilize OP-2-0030123, <i>Reactor Operating Guidelines During Steady-State and Scheduled Load Changes</i></p>
0915 (Approx.)	Contingency message for the Alert declaration.

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**3.2 SCENARIO TIMELINE (Continued)**

<b>TIME</b>	<b>EVENT</b>
0930 (Approx.)	During the course of the downpower, if the operations crew attempts to transfer house electrical loads to the Startup Transformers, the 2A3 4.16 KV bus will lock out on differential current when the "A" 4.16 KV Startup breaker is taken to "close". (If operators have not taken this action voluntarily, the bus will lock out on the reactor trip.) Operators enter ONOP-2-0910054, <i>Loss of Safety Related Bus</i> . Operators stabilize the plant and request assistance from the TSC and OSC. Operations and electrical personnel are dispatched to investigate.
1000	<p>The RCS 2A1 cold leg weld fails and the line shears resulting in a large break Loss of Coolant Accident (LOCA).</p> <p>A <b>SITE AREA EMERGENCY</b> should be declared based upon a LOCA greater than available charging capacity. The full activation of the Emergency Operations Facility (EOF) should begin at this time if not previously done so.</p>
1005 (Approx.)	<p>The reactor and turbine are tripped. After standard post-trip actions, the operations crew enters Emergency Operating Procedure (EOP) 2-EOP-03, <i>LOCA</i>. On the trip, or earlier when aligning loads, the 2A3 4.16 KV bus locks out. Operators stabilize the plant and request assistance from the TSC and OSC. Operations and electrical personnel are dispatched to investigate.</p> <p>The TSC and OSC should be staffed and activated by this time. The EC duties should be turned over to Plant Management in the TSC by this time. The Reactor Vessel Level Monitoring System (RVLMS) indicates head voiding. Safety Injection Tanks (SITs) are injecting.</p>
1030 (Approx.)	Contingency message for the Site Area Emergency declaration.
1100	Recirculation Actuation Signal (RAS) occurs. The 2B LPSI pump trips and will not restart. A leak develops in the Containment Sump piping allowing sump water to be released into the Safety Injection (SI) pipe tunnel and the Unit 2 Reactor Auxiliary Building (RAB) basement. The released activity is picked up by the running 2B ECCS ventilation system and transported to the environment through the 2B ECCS vent stack on the Unit 2 RAB roof.



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**3.2 SCENARIO TIMELINE (Continued)**

<b>TIME</b>	<b>EVENT</b>
1130	<p>As the reactor vessel level drains down and the core uncovers, fuel damage begins.</p> <p>The EC should declare a <b>GENERAL EMERGENCY</b> based upon verified fuel damage with LOCA and loss of containment integrity. Protective Action Recommendations (PAR)s are generated based upon plant conditions.</p>
1140 (Approx.)	<p>Recovery of 2B LPSI and/or HPSI allows reflooding of the core. This will exacerbate the core damage and increase release to the Containment at first until rewetting and cooling of the core can take effect. Containment water is still being released to the basement of the Unit 2 Reactor Auxiliary Building (RAB) through the ECCS pipe tunnel. The released radioactive material enters the environment through the monitored 2B ECCS vent exhaust.</p>
1200 (Approx.)	<p>Contingency message for the General Emergency declaration. Emergency Core Cooling Systems (ECCS) have covered the core. Containment radiation, temperature and pressure have stabilized.</p>
1300	<p>Cooldown, depressurization and/or Low Pressure Safety Injection (LPSI) have refilled the reactor vessel. Field radiation readings have declined. Field monitoring activities continue. The emergency response teams continue to stabilize the reactor, initiate long-term cooling, verify safe shutdown and evaluate containment integrity.</p>
1400 (Approx.)	<p>Termination of Exercise Play</p>

