



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

Report No.: 50-400/86-85

Licensee: Carolina Power and Light Company  
P. O. Box 1551  
Raleigh, NC 27602

Docket No.: 50-400

License No.: CPPR-158

Facility Name: Shearon Harris

Inspection Conducted: October 27-29 and November 10, 1986

Inspector: W. M. Sartor  
W. M. Sartor

11/24/86  
Date Signed

Accompanying Personnel: D. R. Fisher (Battelle)  
R. J. Traub (Battelle)  
D. H. Schultz (Comex)  
M. I. Good (Comex)

Approved by: T. R. Decker  
T. R. Decker, Section Chief  
Division of Radiation Safety and Safeguards

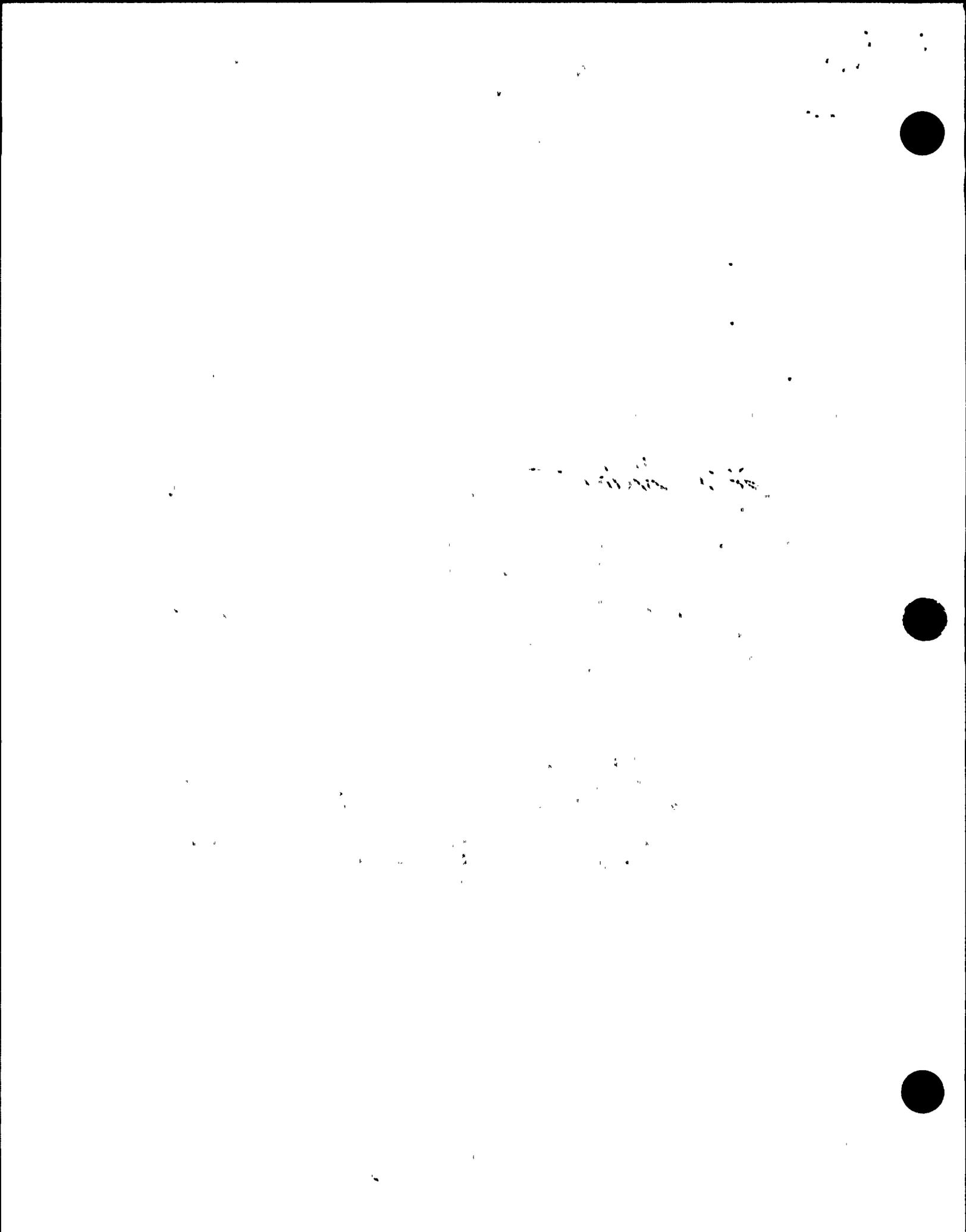
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SUMMARY

Scope: Routine announced inspection of the annual Shearon Harris Emergency Exercise involving observations by five NRC representatives of key emergency organization functions and locations during the exercise.

Results: Within the emergency response areas inspected, no violations or deviations were identified. Four exercise weaknesses were identified.

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## REPORT DETAILS

## 1. Persons Contacted

## Licensee Employees

- \*\*\*J. L. Willis, Plant General Manager
- \*\*R. G. Black, Manager, Emergency Preparedness
- \*\*\*S. R. Zimmerman, Manager, Nuclear Licensing
- \*\*\*H. R. Goodwin, Senior Specialist - Emergency Preparedness
- \*\*\*J. R. Sipp, Manager - Environmental and Radiation Control
- \*\*\*A. L. Garrou, Senior Specialist - Emergency Preparedness
- \*\*\*B. W. Morgan, Senior Specialist - Health Physics
- \*\*E. Stafford, Operator
- \*G. R. Gibson, Assistant to General Manager
- \*R. A. Watson, Vice President, Harris Nuclear Project
- \*G. G. Campbell, Manager Maintenance
- \*J. M. Collins, Manager, Operations
- \*A. W. Powell, Director, Nuclear Training
- \*R. B. Starkey, Manager, Nuclear Safety and Environmental Services
- \*W. F. Trolenburg, Project Specialist - Emergency Preparedness

Other licensee employees contacted included managers, engineers, technicians, operators, mechanics, security office members and office personnel.

## Other Organization

- \*H. L. Reese, State of North Carolina, Department of Emergency Management

## NRC Resident Inspectors

- G. Maxwell
- \*S. Burris

\*Attended exit interview

\*\*Participated in November 10, 1986, telephone call during which additional information was provided.

\*\*\*Attended both the exit interview and participated in the telephone call.

## 2. Exit Interview

The inspection scope and findings were summarized on October 29, 1986, with those persons indicated in Paragraph 1 above. The inspector described the areas inspected and discussed in detail the inspection findings. On November 10, 1986, the licensee provided additional information for consideration concerning the inspection findings. The information was provided by telephone to Messrs. P. E. Fredrickson, T. R. Decker, and W. M. Sartor of the NRC by those licensee personnel indicated above. During



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the conversation, the licensee confirmed the commitment to take necessary corrective action by December 15, 1986, to eliminate the confusing interpretation of EALs addressing the declaration of Site Area Emergency observed in the exercise; and confirmed the commitment to demonstrate accountability of selected personnel during the next exercise.

The licensee did not identify as proprietary any of the material provided to or reviewed by the inspector during this inspection.

3. Licensee Action on Previous Enforcement Matters

This subject was not addressed in the inspection.

4. Exercise Scenario (82301)

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 on several occasions. As a result of these discussions, the licensee submitted a revised scenario that was a significant improvement over the initial submission. Only minor scenario problems were observed during the exercise. The most significant inconsistency occurred because neither an adequate contingency message nor controller guidance provided an explanation to the Control Room and TSC staffs as to why their requests to cooldown/depressurize were being ignored. This failure to provide necessary player guidance by use of contingency message or controller input was identified as an inspector followup item (50-400/86-85-01).

No violations or deviations were identified.

5. Assignment of Responsibility (82301)

This area was observed to determine that primary responsibilities for emergency response by the licensee have 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 specific criteria in NUREG-0654, Sections II.A and II.B.

The inspectors verified that the licensee made specific assignments to the emergency organization. The inspectors observed the activation, staffing, and operation of the emergency organizations in the Control Room, the Technical Support Center (TSC), the Operations Support Center (OSC), and the Emergency Operations Facility (EOF). At each of these centers, the assignment of emergency staff personnel appeared to be consistent with the licensee's emergency plan.



- a. Control Room - Control Room personnel responded quickly in handling a real medical emergency that coincided with the initiation of the exercise. Following this, they effectively handled the simulated contaminated injured individual. The first-aid team was promptly dispatched to the scene of the injury and offsite assistance was requested according to procedures. The required notification of unusual event (NOUE) was made to both the "State and Counties" and the NRC. However, later in the exercise Control Room personnel demonstrated some difficulties with emergency classification and notifications accompanying the turbine failure and the turbine trip/reactor trip (See Paragraphs 7 and 8). Additionally, an inspector noted that procedural adherence and technical specification compliance was a problem. Specifically, the Control Room staff and the TSC staff made several attempts to cooldown and depressurize with no source range nuclear instrumentation available, which was contrary to Action 5-b., Table 3.3-1 of the Technical Specifications. The Control Room crew also failed to implement or demonstrate awareness of a precaution and limitation step of GP-007, "Normal Plant Cooldown."

Exercise Weakness (50-400/86-85-02): Failure of the Control Room staff to demonstrate technical specification and procedural compliance during cooldown.

- b. Technical Support Center (TSC) - The TSC was activated and staffed after the simulated emergency conditions led to an Alert emergency classification. The TSC staff appeared to be knowledgeable concerning their emergency responsibilities. It was noted that noise discipline was poor and some of the information disseminated during TSC staff briefings could not be heard by all concerned personnel. Additionally, the talking of personnel during PA announcements could have prevented emergency organization members from confirming conditions or realizing missing information. An inspector also noted that several scratch logs were being used but were not retained.
- c. Operations Support Center (OSC) - The OSC was activated and staffed promptly following the declaration of the Alert. An inspector observed that operations were well supervised and frequent status meetings on plant conditions were conducted.
- d. Emergency Operations Facility (EOF) - An inspector noted that the EOF was slow in activation although staffing appeared complete. The licensee noted excessive delays for security to clear personnel access to the EOF. The facility appeared to be adequately arranged and equipped for effective operations. Status boards were strategically located, promptly posted, and effectively used in EOF status briefings. The general emergency declaration and initial protective action recommendations (PAR) had come from the Site Emergency Coordinator (SEC) in the TSC, however, the EOF properly assumed the PAR responsibility from the SEC and communicated with appropriate offsite authorities. The inspector noted that following the closure of the power operated relief valve (PORV), the SEC downgraded the emergency

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classification without coordinating this decision with the Emergency Response Manager in the EOF. Although the licensee's plan and procedures permit this declassification unless the NRC's Director of Site Operations is at the site or EOF, the need for coordinating this decision with the EOF was emphasized. This coordination is needed to permit the Emergency Response Manager to discuss with the State the effects that the declassification may have upon the PARs that the State has implemented.

No violations or deviations were identified.

6. Emergency Response Support and Resources (82301)

This area was observed to determine that arrangements for requesting and effectively using assistance resources had been made and that other organizations capable of augmenting the planned response were identified as required by 10 CFR 50.47(b)(3), 10 CFR 50, Appendix E, Paragraph IV.A, and specific criteria in NUREG-0654, Section II.C.

An inspector observed that offsite transportation for a contaminated injured individual was requested according to procedures and the ambulance responded quickly. The simulated accident victim was then transported to Rex Hospital for treatment in accordance with the licensee's letter of agreement.

No violations or deviations were identified.

7. Emergency Classification System (82301)

This area was observed to determine that a standard emergency classification and action level 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 inspector observed that the emergency classification system was in effect as stated in the radiological emergency plan and the implementing procedures. Early in the exercise an incorrect calculation of the order of magnitude increase of an area radiation monitor resulted in an Alert emergency condition being declared prior to the Emergency Action Level (EAL) actually having been exceeded. Although the error was soon detected it resulted in inconsistent notification messages being provided to the "State and Counties" versus the NRC (See Paragraph 8). Later in the exercise a significant concern was noted regarding the declaration of the Site Area Emergency based on the loss of two of the three fission product barriers as indicated in Attachment 3 to Plant Emergency Procedure (PEP) 101, titled, "Emergency Classification and Initial Emergency Actions." The concern was the fact that the Site Emergency Coordinator (SEC) interpreted Attachment 3 (specifically, the loss of containment breach on a failed open power operated relief valve) differently than the scenario team had interpreted it. This resulted in the SEC declaring the SAE under protest when provided a contingency message by the exercise lead controller. The possibility for different interpretations of the loss of a fission product barrier in the

licensee's EAL scheme as observed during the exercise was considered the most significant negative finding of the exercise. The licensee also identified this concern and has committed to take corrective action by December 15, 1986.

Exercise Weakness (50-400/86-85-03): Different interpretations of the licensee's EAL scheme were observed during the exercise.

No violations or deviations were identified.

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

This area was observed to determine that procedures had been established for notification by the licensee of State and local response organizations and emergency personnel, and that the content of initial and followup messages to response organizations had been established; and means to provide early notification to the populace within the plume exposure pathway have been established as required by 10 CFR 50.47(b)(5), 10 CFR 50, Appendix E, Paragraph IV.D, and specific criteria in NUREG-0654, Section II.E.

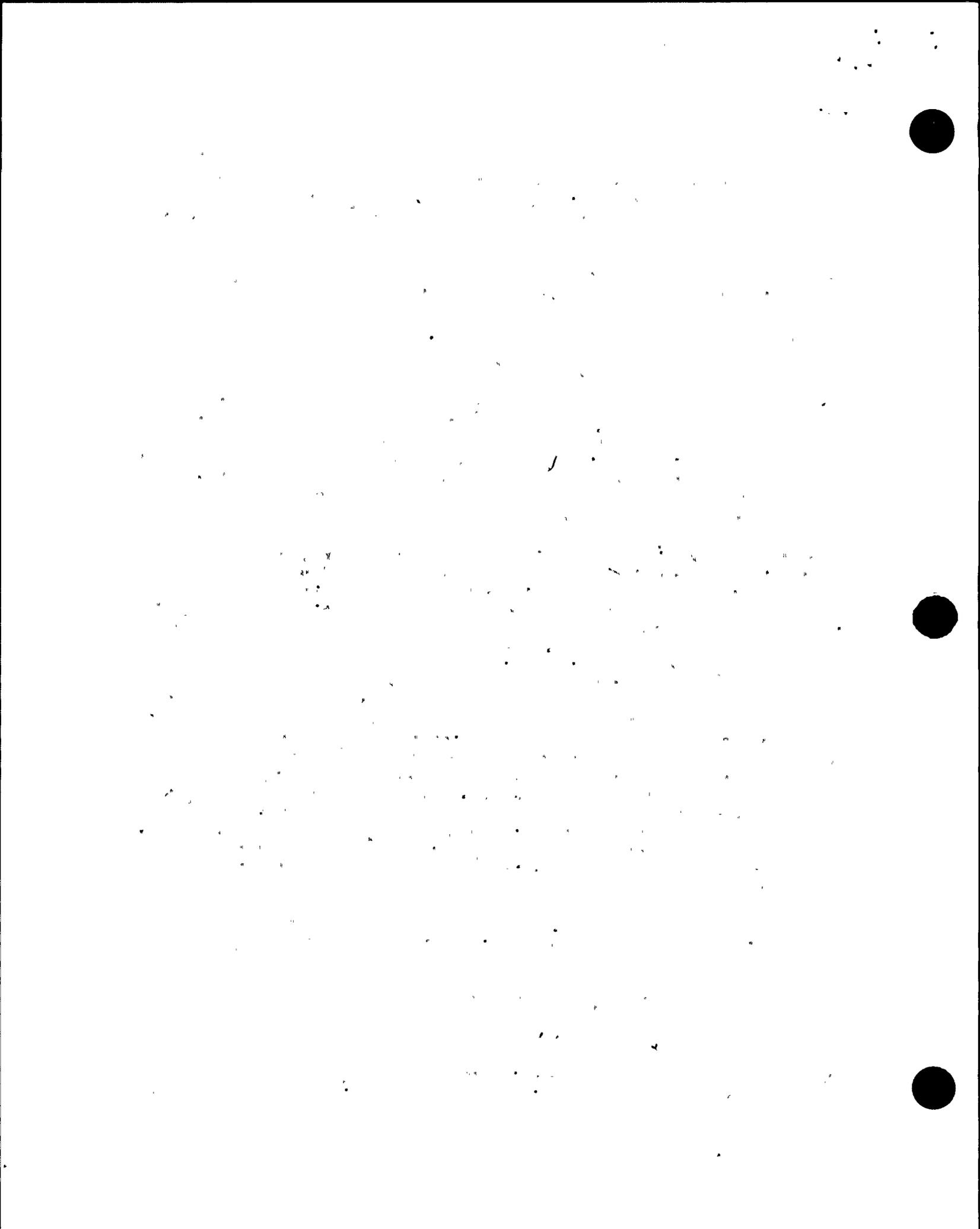
Inspectors observed that notification methods and procedures had been established to provide information concerning the simulated emergency conditions to Federal, State, and local response organizations and to alert the licensee's augmented emergency response organization. However, the inspector observed that different notifications were made to the "State and Counties" and to the NRC. The notifications provided different times of declaration and different initiating events for the Alert emergency classification. In addition, the initiating event reported by the Control Room to the NRC contained incorrect data by reporting a 1 X 4 inch hole in the low pressure turbine casing versus the scenario reported one foot by four foot hole. The licensee also identified the inconsistent notifications during the critique but failed to acknowledge any significance to the differences because of the changing events during this period of time. The inspector emphasized the need for ensuring consistent information be provided to the "State and Counties" and the NRC, such that the overall response effort can be unified without unnecessary confusion created by different Alert notification messages. The licensee provided no update message to either party correcting or accounting for the different notifications.

Exercise Weakness (50-400/86-85-04): Failure to provide consistent notifications of the emergency classification to the "State and Counties" and the NRC.

No violations or deviations were identified.

#### 9. Emergency Communications (82301)

This area was observed to determine that provisions existed for prompt communications among the principal response organization 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.

It appeared that administrative and equipment provisions for communications were adequate with the exception of the malfunctioning facsimile machine in the EOF. This required the Emergency Response Manager to concur on the press releases over the telephone.

No violations or deviations were identified.

#### 10. Public Education and Information (82301)

This area was observed to determine that information concerning the simulated emergency had been made available for dissemination to the public as required by 10 CFR 50.47(b)(7), 10 CFR 50, Appendix E, Paragraph IV.D, and specific criteria in NUREG-0654, Section II.G.

Information was provided to the media and the public in advance of the exercise. The licensee established its Plant Media Center in Raleigh, North Carolina, and provided periodic news announcements.

No violations or deviations were identified.

#### 11. Emergency Facilities and Equipment (82301)

This area was observed to determine that adequate emergency facilities and equipment to support 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.

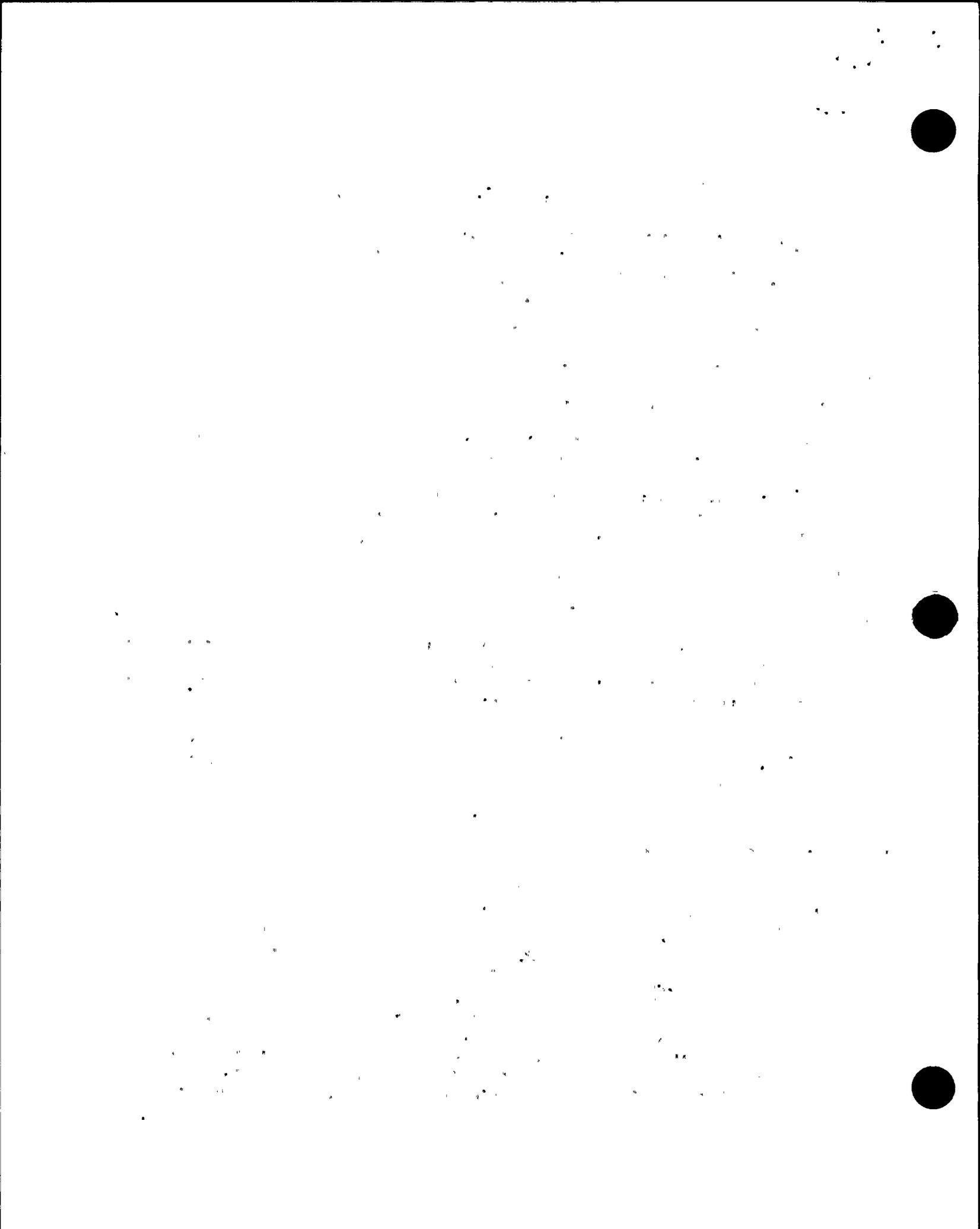
The emergency response facilities were activated and staffed during the exercise. The facilities appeared to be adequately equipped to support the emergency response.

No violations or deviations were identified.

#### 12. Accident Assessment (82301)

This area was observed to determine that 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 50.48(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. The dose assessment methods incorporated both detailed meteorological parameters and in-plant conditions. An inspector noted that there appeared to be significant differences between the dose projection values and the field data with no



apparent resolution. This inconsistency was identified to the licensee for followup.

Inspector Followup Item (50-400/86-85-05): Dose projections and field monitoring team data differed significantly.

No violations or deviations were identified.

### 13. 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.

An inspector verified that the licensee had emergency procedures for formulating protective action recommendations for offsite populations within the ten-mile EPZ. The licensee's protective action recommendations were consistent with the EPA and other criteria, however, the partial accountability of onsite personnel by the licensee was neither timely nor complete. During a TSC staff briefing at 1627 hours the SEC indicated "Assembly has been asked for." However, it was not until 1719 hours that the Logistics Support Director announced that accountability was complete as of 1710 hours. It was later determined that the Control Room had not reported accountability to the TSC because no one was missing and the accountability procedures were not sufficiently clear to indicate a report should have been provided indicating all personnel were accounted for. This failure to provide complete and timely accountability was identified to the licensee during the exit critique.

The licensee has committed to demonstrating a partial accountability in their next exercise scheduled for February 28, 1987.

Exercise Weakness (50-400/86-85-06): Inadequate accountability, both from a performance and procedural aspect.

No violations or deviations were identified.

### 14. Exercise Critique (82301)

The licensee's critique of the emergency exercise was observed to determine that deficiencies identified as a result of the exercise and weaknesses noted in the licensee's emergency response organizations were formally presented to licensee management for corrective actions as required by 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 a post-exercise critique on October 29, 1986, and presented the results to licensee management later that day. The licensee's critique was thorough, and identified some 20 items requiring followup which

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included in substance the more significant findings that had been observed by the NRC team. Following the management critique, the NRC inspector provided preliminary findings observed during the exercise.

No violations or deviations were identified.

Attachment:  
Shearon Harris Exercise Scope and  
Objectives and Narrative Summary

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CAROLINA POWER & LIGHT COMPANY

PLAN FOR SHEARON HARRIS NUCLEAR POWER PLANT EMERGENCY  
EXERCISE - OCTOBER 28, 1986

I. MISSION AND PURPOSE OF EXERCISE

To activate and evaluate major portions of emergency response capabilities and other elements of the CP&L Shearon Harris Nuclear Power Plant Plan, associated implementing procedures, and the CP&L Corporate Emergency Plans in accordance with Nuclear Regulatory Commission (NRC) Regulation 10 CFR 50.47(b).

II. SCOPE AND OBJECTIVES

A. Scope

A simulated accident at the Shearon Harris Nuclear Power Plant (SHNPP) 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 require responses by state and local government personnel.

B. Objectives

1. Demonstrate the ability to augment the emergency organization within the specified time limits. (normal working hours)
2. Test the ability of on-site personnel to effectively utilize the emergency action level scheme.
3. Test the ability of on-site personnel to properly classify the emergency based on existing plant conditions.
4. Demonstrate the adequacy of procedures for alerting, notifying, and mobilizing emergency response personnel.
5. Demonstrate the adequacy of the information provided in the initial notification, as well as follow up notifications to the State and Counties.
6. Demonstrate the notification/communication capability with State and local emergency response organizations within the emergency planning zones.
7. Demonstrate the ability to communicate between emergency response facilities, as well as with environmental monitoring teams.

8. Demonstrate the adequacy of control room staff in the ability to perform control and accident mitigation activities along with accident assessment.
9. Demonstrate the adequacy of the Operations Support Center in providing additional manpower support and coordination.
10. Demonstrate the adequacy of the Technical Support Center in providing accident assessment and mitigation, dose assessment and communication/notification activities.
11. Demonstrate the adequacy of the Emergency Operations Facility in providing evaluation and coordination of all on-site activities and information exchange with State and local authorities.
12. Demonstrate the adequacy of the equipment utilized for off-site radiological monitoring.
13. Test the ability to coordinate field monitoring data.
14. Demonstrate the ability of designated dose assessment personnel to determine the release path, as well as, potential release paths, release rates and dose to the public at multiple downwind distances under varying meteorological conditions.
15. Demonstrate that the radiological, meteorological, and process instrumentation, display and data transmittal between the TSC and EOF is adequate.
16. Demonstrate that an emergency radiation protection organization exists on-site with clearly established goals for emergency worker protection.
17. Demonstrate the availability of hospitals and emergency medical services capable of evaluating radiation exposure and uptake and treatment of contaminated injured personnel.
18. Demonstrate the capability for providing on-site first aid.
19. Demonstrate the ability to transport radiologically affected personnel to off-site medical support facilities.
20. Demonstrate the adequacy of emergency kits in the emergency response facilities for providing necessary protective equipment. (i.e. dosimetry, instrumentation protective clothing, respiratory equipment, etc.)

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## II. SCOPE AND OBJECTIVES (Cont'd)

21. Demonstrate timely and effective assessment of the radiological consequences of the accident and of any releases of radioactive material to the environment.
22. Demonstrate capability to make on-site and off-site protective action recommendations.
23. Demonstrate capability to produce public information releases.
24. Demonstrate proper procedure for first aid AND handling a contaminated accident victim.
25. Demonstrate proper procedure for on-site and off-site radiological monitoring to include collection and analysis of all sample media and provisions for communications and record keeping associated with these monitoring activities.
26. Demonstrate proper procedure for preparation of reports, messages, and records.

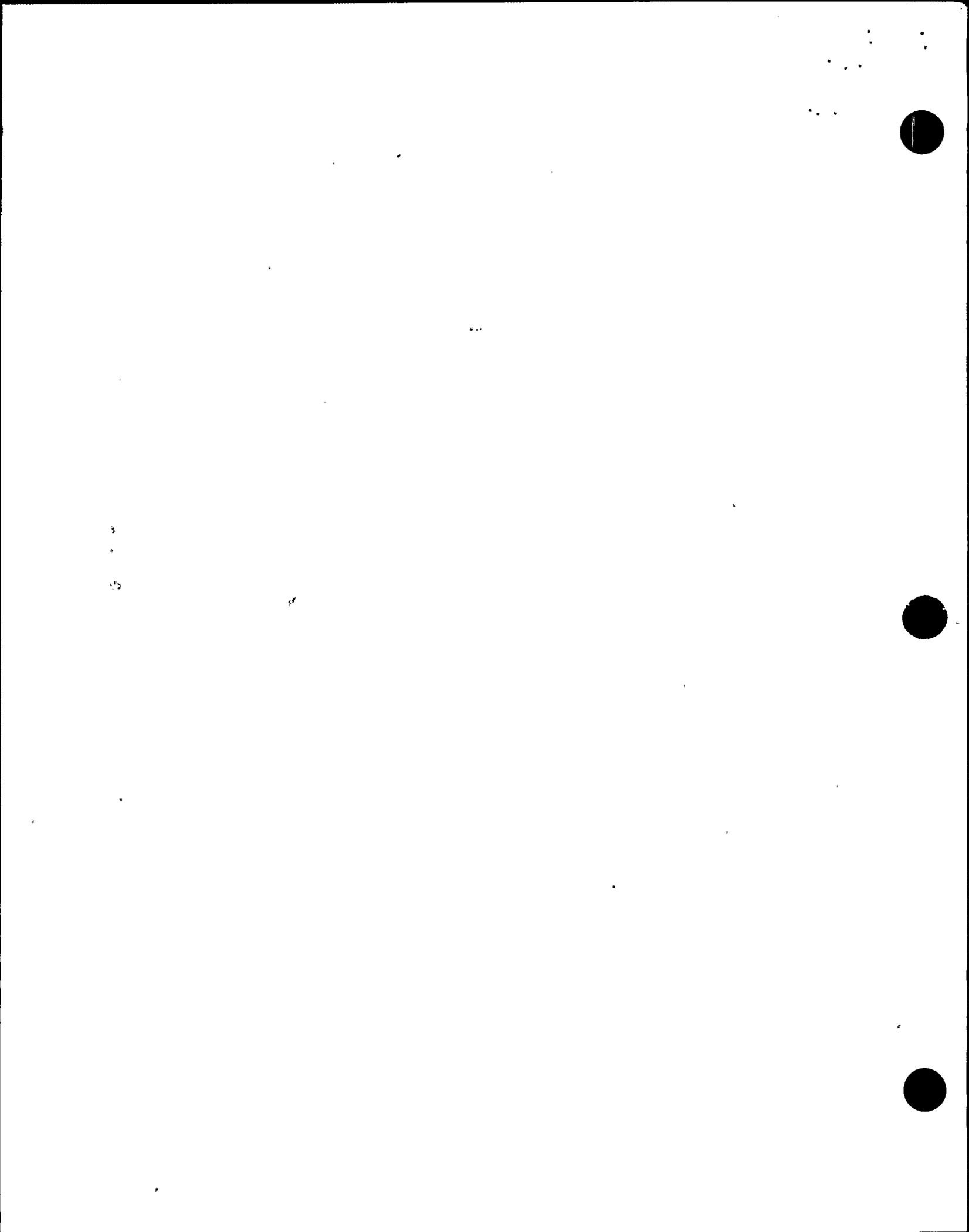
## III. SITUATION AND ASSUMPTIONS

### A. Exercise Dates

1. Start Exercise: October 28, 1986
2. Terminate Exercise: October 28, 1986
3. Critique (evaluators only): October 29, 1986
4. Critique (Lead Evaluators): October 29, 1986
5. Critique (players): October 29, 1986

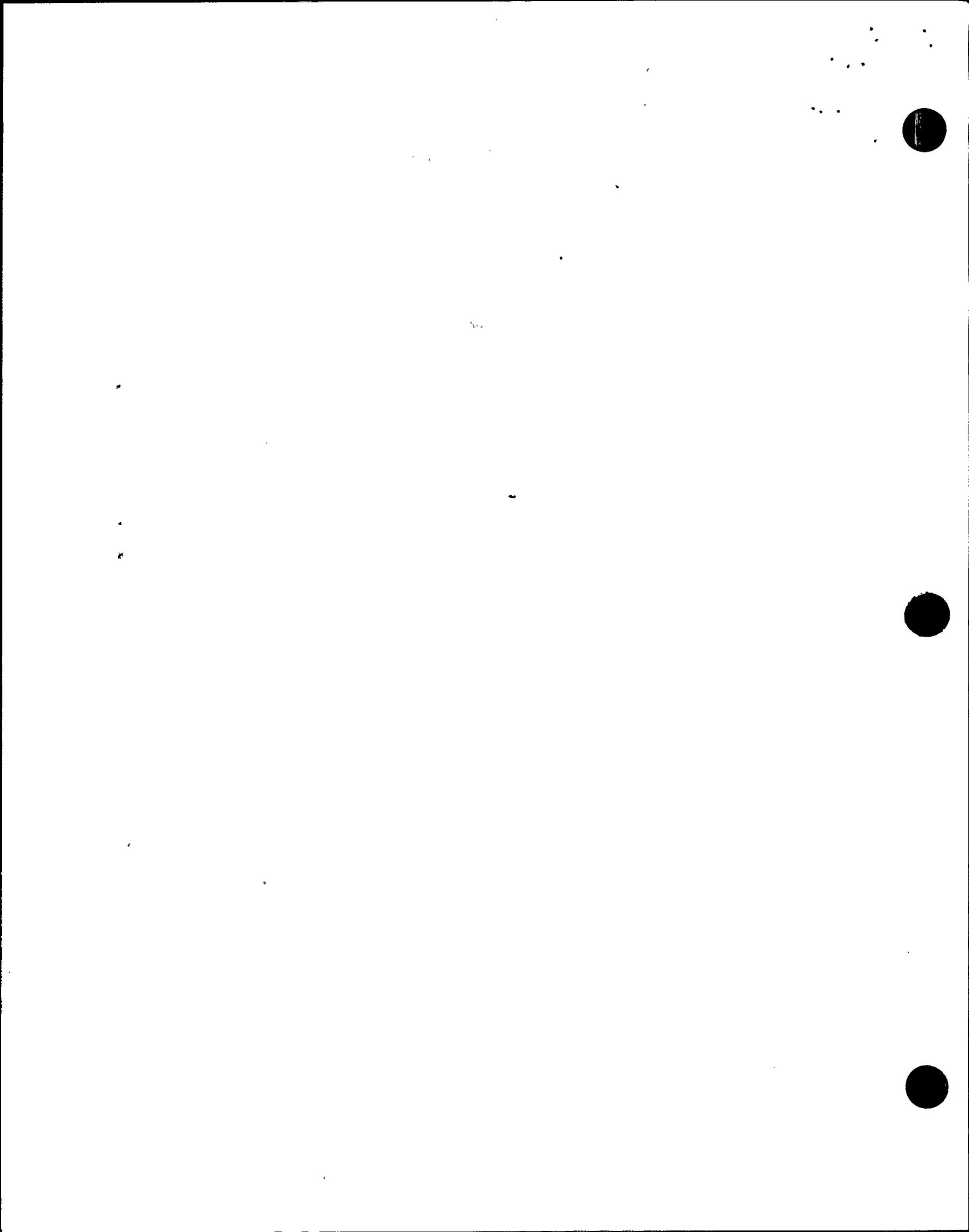
### B. Exercise Locations/Facilities

1. Shearon Harris Nuclear Power Plant, New Hill, North Carolina
  - a. Control Room: Function is to provide plant control and initial direction of all plant related emergency operations.
  - b. 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.



SHNPP EMERGENCY PREPAREDNESS EXERCISE  
SCENARIO TIME LINE  
October 28, 1986

1430	+	Exercise Begins
1435	+	Contaminated Injury in Waste Processing Building Requiring Off-Site Transportation. <u>Unusual Event</u> Condition
1550	+	Turbine Failure, Turbine Trip/Reactor Trip, <u>Alert</u> Condition
1558	+	Letdown Line Rad Monitors Yellow Alarm Minor Fuel Damage
1630	+	Estimated Time of TSC Activation
1638	+	Radiation monitors read greater than 1000 Times Normal (red alarm), <u>Alert</u> Condition
1646	+	Cooldown stopped, "A" SG PORV stuck open - <u>Site Emergency</u> Condition
1730	+	Estimated Time of EOF Activation
1745	+	"A" SG Develops Leak greater than 50 gpm - <u>General Emergency</u> Condition, Release in progress.
1758	+	
1830	+	Plant cooldown continues, damage control teams trying to shut PORV and stop release. Environmental monitoring in progress.
1900	+	
1930	+	
2000	+	PORV Closed, release terminated.
2030	+	Environmental monitoring continues, recovery actions may be discussed in TSC/EOF.
2130	+	
2200	+	Exercise Terminated

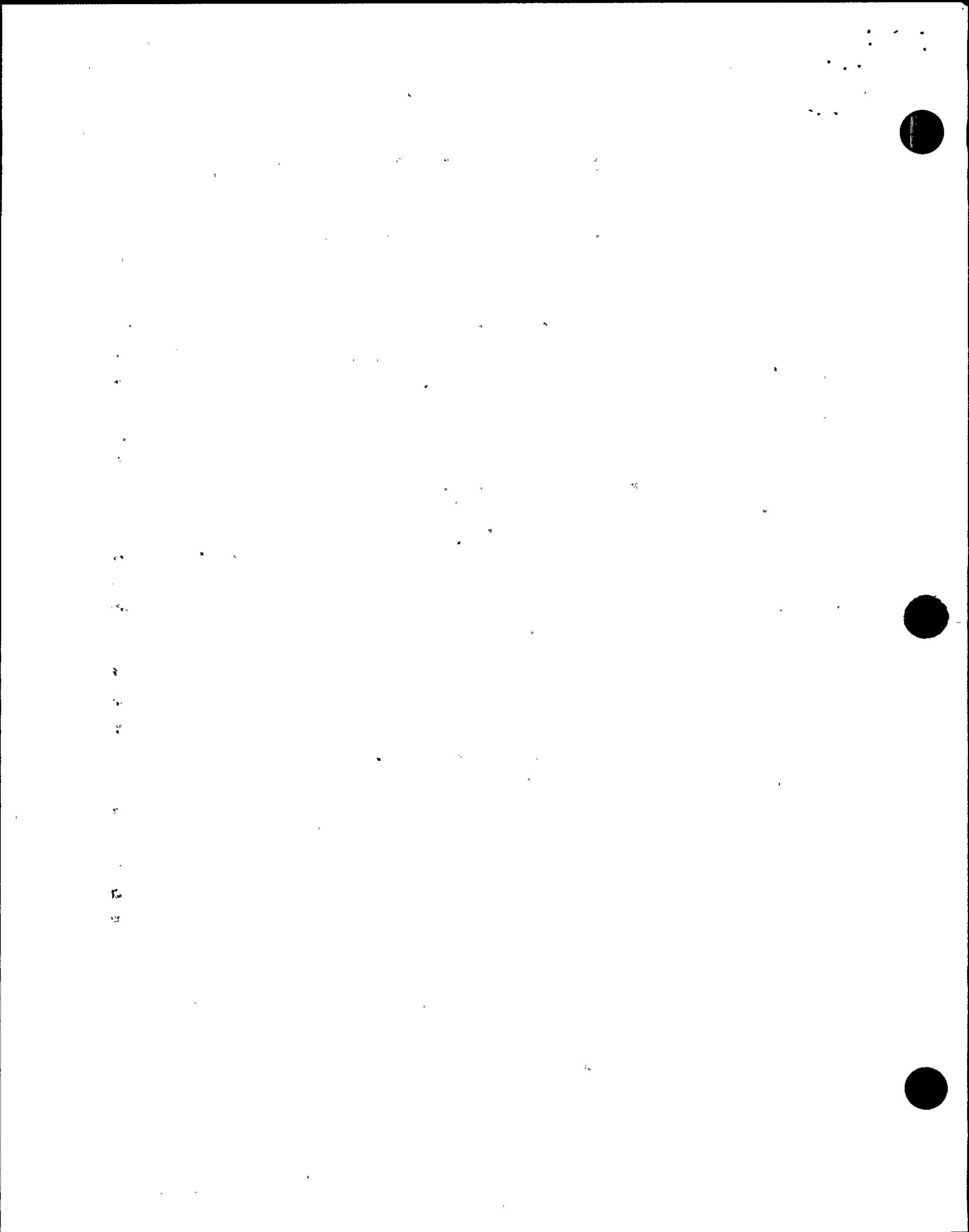


PRE-EXERCISE CONDITIONS

To be Given to Players on October 28, 1986

Shearon Harris NPP Unit Number 1 experienced a reactor trip during an electrical storm 132 days ago. The plant was restarted without incident two days later and has been at 100% power for the past 129 days.

Currently, all systems are functioning properly with the exception of Nuclear Flux Monitoring System "A", and all scheduled maintenance and periodic tests have been completed satisfactorily. All plant chemistry parameters are within their normal range and standard radiological areas are being maintained. Maintenance on a leaking flange on the "A" reverse osmosis concentrates evaporator intake line, located on the 236' elevation in the Waste Processing Building, began at 1330. Based on current projections, the plant should be shutdown for refueling on November 30, 1986. The refueling outage is projected to last 13 weeks.



SHEARON HARRIS NUCLEAR POWER PLANT  
EMERGENCY PREPAREDNESS EXERCISE

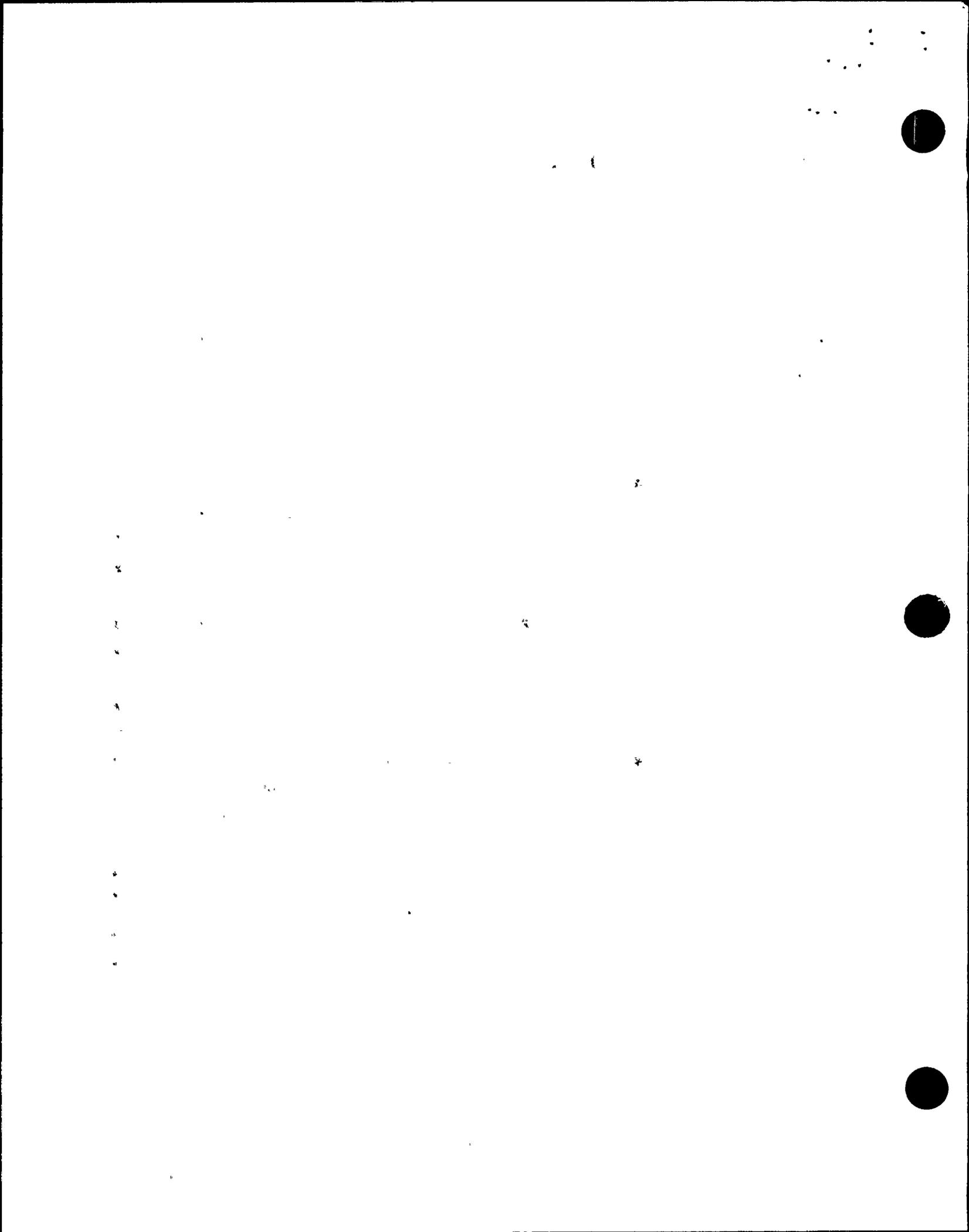
Shearon Harris Unit 1 experienced a reactor trip during an electrical storm 132 days ago. The plant was restarted without incident two days later and has been operating at 100% power for the past 129 days.

Currently, all systems are functioning properly with the exception of Nuclear Flux Monitoring System "A" and all scheduled maintenance and periodic tests have been completed satisfactorily. All plant chemistry parameters are within their normal range and standard radiological areas have been maintained. Maintenance on a leaking flange on the "A" Reverse Osmosis Concentrates Evaporator intake line, located on the 236' elevation in the Waste Processing Building, began at 1330.

At 1435 a call will be made by an exercise controller to the Control Room, reporting that a worker has suffered an apparent heart attack while working in the "A" Reverse Osmosis Concentrates Tank area. The controller will explain that the worker may be contaminated and that he has a cut on his arm which is bleeding profusely.

Plant personnel responding to the injury will find that the injured has been moved to the hallway adjacent to the "A" Reverse Osmosis Concentrates Tank Area. As they investigate they will find that contamination levels are minor and the first aid needs of the injured should be their first priority. Based on a contaminated injured employee requiring transport to an off-site medical facility, the Shift Foreman should declare an Unusual Event per Plant Emergency Procedure (PEP) - 101 "Emergency Classification and Initial Emergency Actions". The Unusual Event should be declared by approximately 0730, followed by transport to Rex Hospital. Upon demonstration of contamination control measures by the Hospital Staff, the medical drill portion of the exercise will be complete.

Upon declaration of the Unusual Event the Shift Foreman will implement the PEPs and assume the position of the Site Emergency Coordinator-Control Room. Off-site notifications concerning the declaration of the Unusual Event will include the State of North Carolina Emergency Warning Point, Chatham County Emergency Warning Point, Harnett County



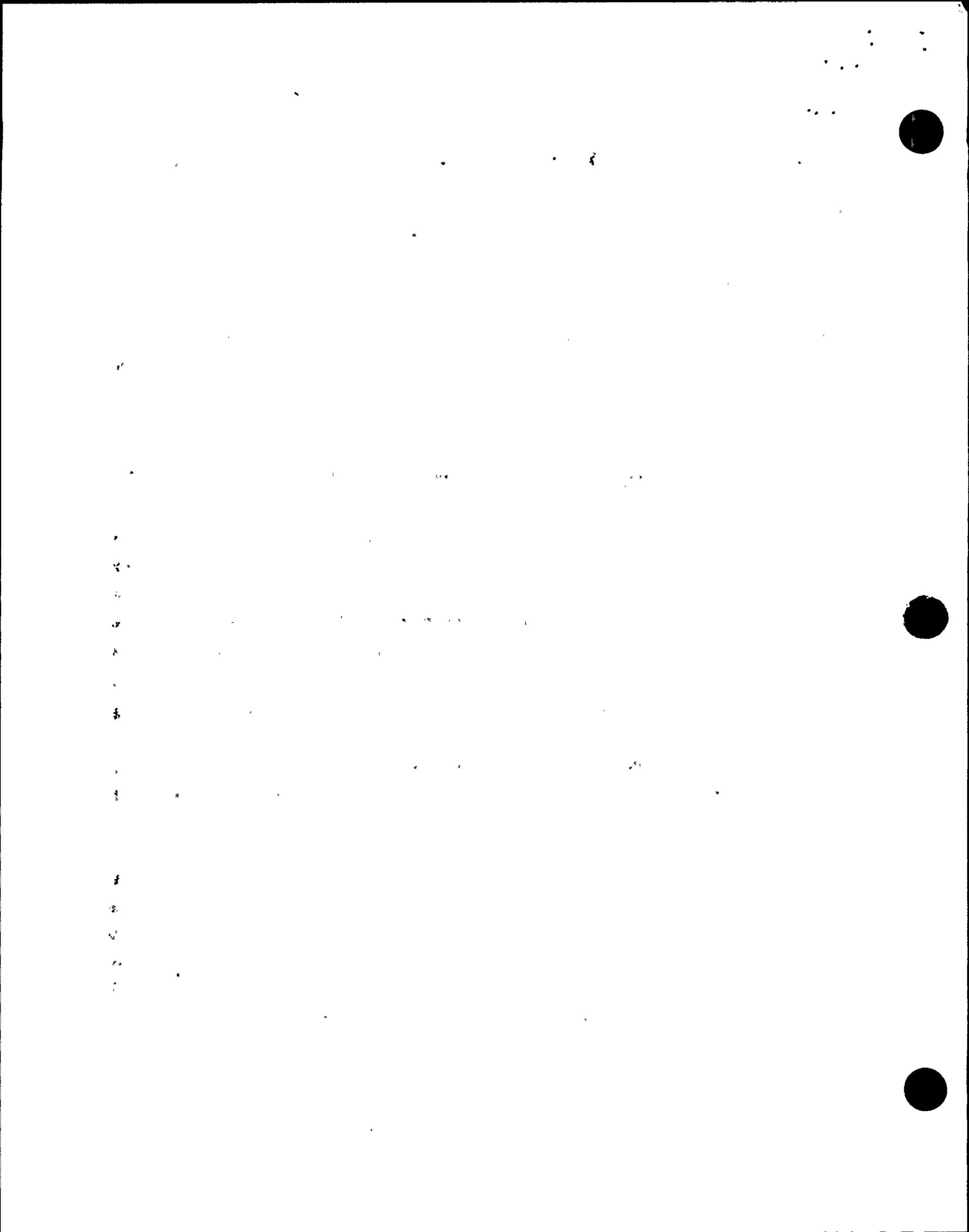
Emergency Warning Point, Lee County Emergency Warning Point, Wake County Emergency Warning Point and the Nuclear Regulatory Commission Operations Center.

At 1547 the "Turbine Trouble" alarm on Annunciator Light Box (ALB)-20 sounds. Upon investigation at the Control Room recorder panel, the operator sees that all turbine vibrations have at least doubled in the last minute and vibrations for bearings #3 and #4 are varying between nine and twelve mils.

Condenser vacuum begins to drop rapidly and at 1550 the turbine trips on low vacuum as annunciated on ALB-18 "Low Vacuum Turbine Trip". The reactor will also trip as indicated by the reactor first out annunciator "Turbine Trip/Reactor Trip". The licensed operators will carry out Flowpath Procedure 1 to verify their immediate actions on the reactor trip and continue into Endpath Procedure 4 to continue with their supplementary post-trip actions. By 1555 the SEC should dispatch an Auxiliary Operator (AO) to walkdown the turbine. Upon investigation the AO reports back that there is a large hole about one foot wide by four foot high on the southeast end of the "A" low pressure turbine casing. The AO also reports that an inrush of air is apparent. This report should be received by 1600. By 1603 condenser vacuum will be zero. The Site Emergency Coordinator - Control Room should implement the appropriate PEP and declare an Alert. At this time he should direct activation of the Operational Support Center (OSC) and Technical Support Center (TSC). The Emergency Operations Facility (EOF), Corporate Emergency Operation Center (CEOC), Plant Media Center (PMC) and Corporate Media Center (CMC) may also be activated at this time. Off-site notifications will include the State of North Carolina, Chatham County, Harnett County, Lee County, Wake County and the Nuclear Regulatory Commission.

As personnel begin to assemble for activation of the TSC, transfer of the Site Emergency Coordinator from the Control Room to the TSC will occur after the individual to assume the SEC-TSC position has arrived in the TSC. This transfer may occur before the TSC is fully operational as per PEP-102.

Fuel cladding damage is sustained from the rod motion on the reactor trip. The Volume Control Tank (VCT), Letdown Line and Charging Pump Area Radiation Monitors indicate increasing radiation levels beginning at 1555. The Operations Leader should immediately carry out the actions of Abnormal



Operating Procedure (AOP)-5 for a high radiation level on an area monitor. He will sound the local evacuation alarm and announce an evacuation of the affected areas.

The Operations Leader should expeditiously commence a plant cooldown as required by Technical Specification 3/4.4.8 due to excessive activity in the reactor coolant. Per AOP-32 (High RCS Activity) the operators will have Chemistry sample the primary coolant, Radiation Control survey the affected areas, place the Cation Demineralizer in service and commence a cooldown by approximately 1606. The Steam Generator Power Operated Relief Valves (PORVs) will be used for the cooldown because of the prior loss of condenser vacuum. A cooldown rate of 60°F/hr will be used. All three main steam isolation valves (MSIVs) will remain open to facilitate an even cooldown of the three steam generators.

At 1638 "Radiation Monitor System Trouble" annunciator sounds due to a radiation level of 1000 times normal in the charging pump and VCT areas. The Site Emergency Coordinator should recognize that the coolant's activity level qualifies as a breach of the fuel cladding as determined in Attachment 3 of PEP-101 and he should maintain the Alert emergency classification.

At 1646 the plant's temperature is less than 500°F as required and the control operator stops the plant cooldown by closing the steam generator PORVs. The PORVs for "B" and "C" steam generators close but the "A" steam generator PORV fails at the 10% open position. By 1700 the Operations Leader should dispatch an Auxiliary Operator (AO) to attempt to locally close the "A" PORV or its manual blocking valve. The AO will report back that the "A" PORV is passing steam and his attempts to close the PORV and the blocking valve have been unsuccessful. This occurrence constitutes a breach of the containment boundary. Maintenance personnel should be requested to try to close the valve(s) but their initial efforts will also prove unsuccessful. With both the fuel cladding and containment breached the Site Emergency Coordinator (SEC) should declare a Site Emergency. By this time the Operations Leader should shut all three MSIVs to isolate the "A" Steam Generator.

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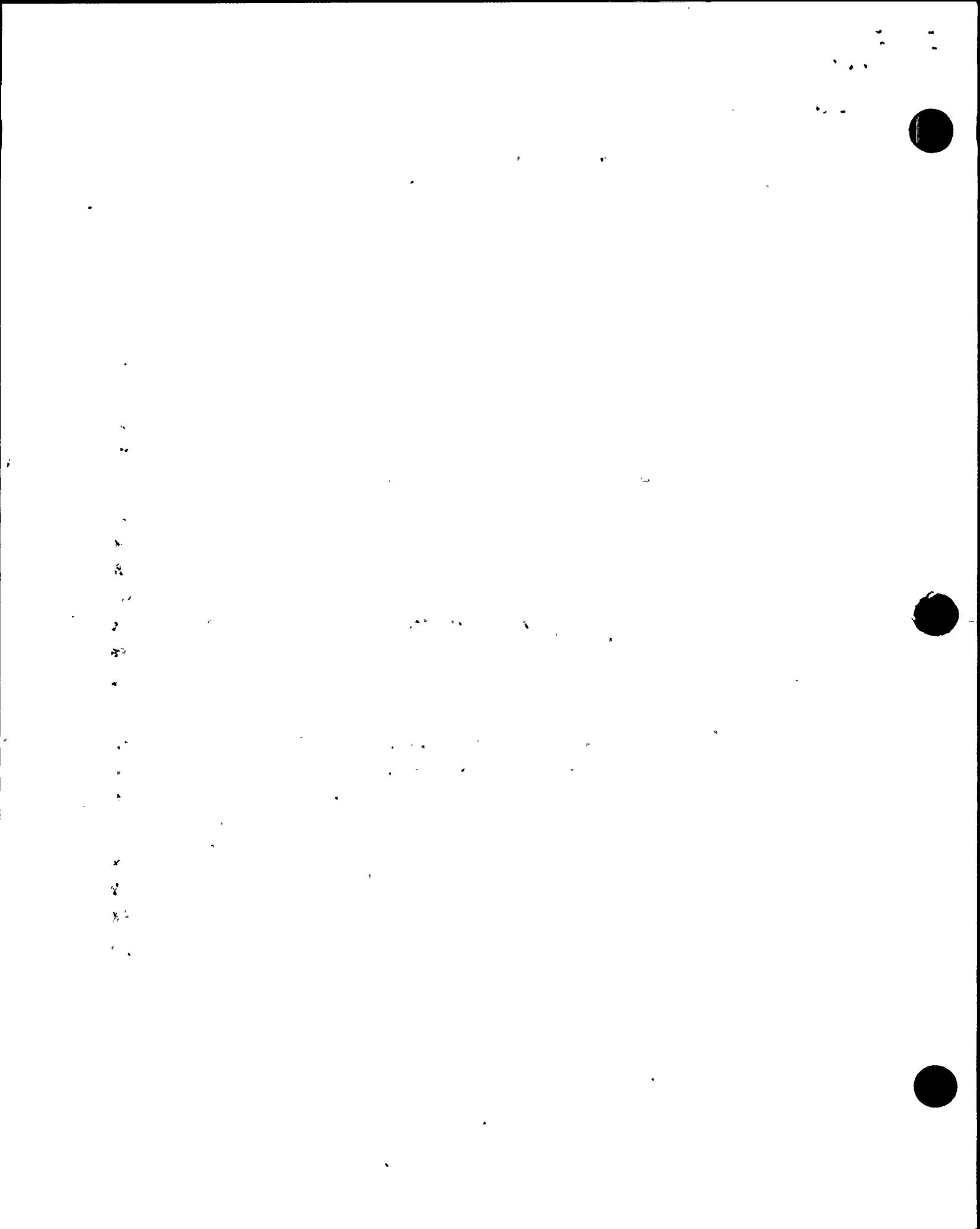
Upon declaration of the Site Emergency the State, all four counties and the NRC will be notified. If not already activated the order should be given to activate the Emergency Operations Facility, Corporate Emergency Operations Center/Plant Media Center and Corporate Media Center.

Upon activation of the Emergency Operations Facility (EOF), the Emergency Response Manager (ERM) is responsible for relieving the Site Emergency Coordinator (SEC) of interfacing with the Corporate Emergency Operations Center, Plant Media Center and off-site agencies. The ERM is responsible for managing and directing all off-site related emergency operations involving the plant. The SEC retains all responsibility for the on-site emergency response.

Environmental Monitoring teams will be activated and will conduct environmental sampling and monitoring as specified in Plant Emergency Procedures. The Environmental Monitoring Teams will track the plume by monitoring radiation levels as indicated on radiological measuring instruments, and by obtaining and analyzing air samples. Exercise Controller/Evaluators will accompany Environmental Monitoring Teams and will supply sample and monitoring data as appropriate based on canned meteorological data.

At 1758 the VCT automatic makeup activates as indicated by clicking of the makeup water counters. This is caused by a 68 gpm primary to secondary leak in the "A" Steam Generator. Charging flow has increased automatically to maintain pressurizer level at its programmed 25% level. Per AOP-16 "Excessive Primary Plant Leakage" the operators will isolate letdown. They should verify that automatic makeup functions properly and that additional charging pumps are not necessary. Operational Surveillance Test (OST)-1026 should be performed to determine the actual leak rate.

After determining the leakage is within the capacity of normal makeup (120 gpm), the operating crew should conclude that safety injection is not required. Continuance of AOP-106 requires a normal plant shutdown and cooldown to less than 200°F. Reactor pressure is reduced via pressurizer spray to keep the minimum allowable subcooling, thereby reducing the differential pressure and leak rate from the primary system to the steam generator. Letdown restoration efforts, if attempted, will be unsuccessful due to the failure of letdown isolation valve LCS-11 in the closed position.



Upon determination of the steam generator tube leakage, a General Emergency should be declared as the final fission product boundary is breached.

Upon declaration of the General Emergency, the State, all four counties and the Nuclear Regulatory Commission Operations Center will be notified.

The EOF will recommend to the off-site government authorities protective actions which should be taken by the public. This recommendation will be developed as per PEP-104 "Protective Action Recommendations". Based on simulated plant conditions it is expected that the recommendation will be to "shelter subzone A and all subzones 2-5 miles downwind". Subzones involved will be based on canned meteorological data at the time of the exercise.

At 2000, maintenance personnel report that the "A" Steam Generator PORV is closed. At about 2010, the residual heat removal (RHR) system is placed in service and the cooldown/depressurization is continued per General Operating Procedure 7 "Normal Plant Cooldown." At 2034, reactor coolant system and "A" steam generator pressure are equal causing the leakage to stop. Depressurization of the reactor coolant system will stop at 2045 when the "A" Steam Generator shows a level decrease. Plant cooldown will continue using the RHR system.

Based on plant conditions and off-site radiological conditions the decision may be made to implement recovery actions. If so, appropriate notifications should be made, a recovery staff designated and a discussion of recovery actions held.

When satisfied that the players have had the opportunity to meet all exercise objectives, the Exercise Lead Controller should confer with the Exercise Director, the NRC Evaluation Team Leader, the Site Emergency Coordinator, the Emergency Response Manager, and the State Lead Controller to solicit their concurrence on termination of the exercise.

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