



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

OCT 29 1991

Report No.: 50-400/91-19

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

Docket No.: 50-400

License No.: NPF-63

Facility Name: Shearon Harris Nuclear Power Plant

Inspection Conducted: September 9-12, 1991

Inspector: James L. Kreh 10-24-91  
J. L. Kreh Date Signed

Accompanying Personnel: W. M. Sartor (NRC Region II)  
B. C. Haagensen (Sonalysts, Inc.)

Approved by: Fred W. Doughty for 10/21/91  
W. H. Rankin, Chief Date Signed  
Emergency Preparedness Section  
Radiological Protection and Emergency  
Preparedness Branch  
Division of Radiation Safety and Safeguards

SUMMARY

Scope:

This routine, announced inspection primarily involved the observation and evaluation of the annual emergency preparedness exercise. Emergency organization activation and response were selectively observed in the exercise Control Room, Technical Support Center (TSC), Operational Support Center (OSC), and Emergency Operations Facility (EOF). The inspection also included a review of the exercise scenario and observation of the licensee's critique. The primary phase of the exercise, which included full participation by State and local governments as well as the NRC, was conducted on September 10, 1991, between the hours of 3:00 p.m. and 11:00 p.m. On the following day, the State of North Carolina conducted an ingestion-pathway tabletop exercise using data extrapolated from the scenario for the previous day's exercise.

Results:

In the areas inspected, no violations or deviations were identified. The Harris Plant's emergency response capability was determined to be fully adequate for the protection of the health and safety of the public in the event of a real emergency. The licensee's emergency response organization performed capably and efficiently, interacting productively with the 30 NRC personnel who participated in exercise play at the TSC and EOF.

## REPORT DETAILS

### 1. Persons Contacted

#### Licensee Employees

- \*R. Baldwin, Senior Specialist, Emergency Preparedness (Corporate)
- \*R. Bassett, Senior Specialist, Emergency Preparedness
- \*E. Bean, News Coordinator, Corporate Communications
- \*M. Blocker, Specialist, Emergency Preparedness
- \*D. Braund, Manager, Plant Security
- \*J. Collins, Manager, Operations
- \*A. Garrou, Project Specialist, Emergency Preparedness (Corporate)
- \*C. Gibson, Manager, Programs and Procedures
- \*R. Goodwin, Project Specialist, Emergency Preparedness (Corporate)
- \*K. Heffner, Manager, Maintenance Planning
- C. Hinnant, Plant General Manager
- \*R. Indelicato, Manager, Emergency Preparedness (Corporate)
- \*B. Meyer, Manager, Environmental and Radiation Control
- \*J. Morris, Manager, Instrumentation and Control/Electrical
- \*T. Morton, Manager, Maintenance
- \*J. Nevill, Manager, Technical Support
- \*C. Olexik, Manager, Regulatory Compliance
- \*W. Pridgen, Manager, External Communications, Corporate Communications
- R. Richey, Vice President, Harris Nuclear Project
- M. Wallace, Senior Specialist, Regulatory Compliance
- \*E. Willett, Manager, Outages and Modifications
- \*W. Wilson, Manager, Spent Nuclear Fuel
- \*N. Wolfe, Manager, Site Information Services

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

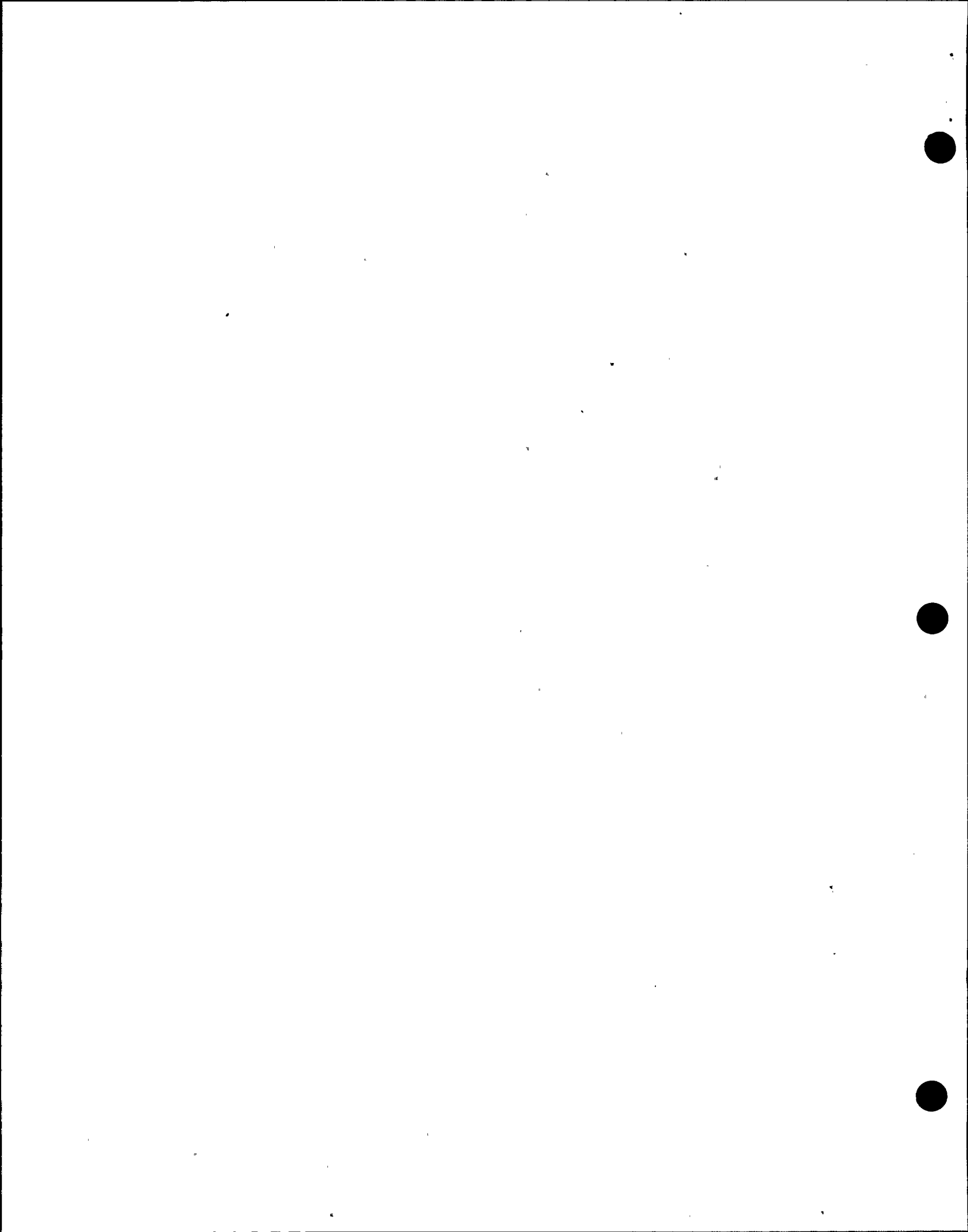
#### Nuclear Regulatory Commission (NRC)

- \*M. Glasman, Project Engineer, Region II
- M. Shannon, Resident Inspector

\*Attended exit interview

### 2. Exercise Scenario (82302)

The scenario for the emergency exercise was reviewed to determine whether provisions had been made to test the integrated emergency response capability and a major portion of the basic elements within the licensee's Emergency Plan, as required by 10 CFR 50.47(b)(14) and Section IV.F of Appendix E to 10 CFR Part 50.



The NRC's advance review of the scenario identified only minor technical problems, which were discussed with licensee representatives and satisfactorily resolved prior to the start of the exercise. No significant inconsistencies in the scenario data were disclosed during the exercise.

The scenario developed for this exercise presented a series of simulated events which fully challenged the licensee's emergency organization, and provided information to the States, counties, and Federal agencies consistent with the scope of their participation in the exercise. The licensee demonstrated adequate training of personnel through use of controllers, evaluators, and specialists participating in the exercise. The controllers provided adequate guidance throughout the exercise. Neither prompting by controllers nor undue interaction between controllers and players was observed.

The remainder of this report makes frequent references to exercise conditions involving personnel casualties and facility equipment failures with resulting damage, all of which were postulated to have occurred in order to effect activation of the licensee's emergency response organization. All such conditions referenced herein were simulated, although the licensee's responses actually occurred (to the extent practicable) and were evaluated.

The attachment to this report exhibits the licensee's exercise objectives and a narrative summary of the scenario.

No violations or deviations were identified.

### 3. Onsite Emergency Organization (82301)

The licensee's organization was observed during the exercise to determine whether the requirements of Paragraph IV.A of Appendix E to 10 CFR Part 50 (as addressed in the Emergency Plan) were implemented with respect to the descriptions, responsibilities, and assignments of the onsite emergency response organization.

The inspector determined that the initial onsite emergency organization was adequately defined and that primary and alternate assignments for the positions in the augmented emergency organization were clearly designated. The inspector observed that specific emergency assignments were made for the licensee's emergency response organization, and that adequate staff was available to respond to the simulated emergency. The initial response organization was augmented by designated licensee representatives. During the course of the exercise, facility managers at the TSC, OSC, and EOF made plans for staffing of, and turnover to, the next shift. However, because of the scenario scope and conditions, long-term or continuous staffing of the emergency response organization was not required.

No violations or deviations were identified.

#### 4. Emergency Response Support and Resources (82301)

This area was observed to determine whether arrangements for requesting and effectively using assistance resources were made, whether arrangements to accommodate State personnel at the EOF and NRC staff at the EOF and TSC were adequate, and whether other organizations capable of augmenting the planned response were identified as specified by 10 CFR 50.47(b)(3), Paragraph IV.A of Appendix E to 10 CFR Part 50, and guidance promulgated in Section II.C of NUREG-0654 (Revision 1).

Licensee involvement and contact with Federal, State, and local support organizations occurred in accordance with applicable Plant Emergency Procedures (PEPs) and were consistent with the scope of the exercise. Assistance resources from offsite support agencies were available to the licensee and were tested during the exercise in the case of the Apex Rescue Squad, which was called to treat and transport a contaminated injured worker. This aspect of the exercise was not observed by the inspectors.

No violations or deviations were identified.

#### 5. Emergency Classification System (82301)

This area was observed to verify that a standard emergency classification and action level scheme was in use by the licensee as required by 10 CFR 50.47(b)(4) and Paragraph IV.C of Appendix E to 10 CFR Part 50, and to determine whether that scheme was adequately implemented.

An emergency action level (EAL) flow chart was available to identify and properly classify an emergency and escalate it to more severe classifications as the accident progressed. The licensee's use of the EALs in deriving each of the emergency classifications was methodical and appropriately conservative, with results as follows:

- The initial emergency classification was Alert, based upon the detection of a fire affecting safety-related equipment (the "A" Charging Safety Injection Pump). The Alert was declared at 3:29 p.m. by the Shift Foreman, who at that time became the interim Site Emergency Coordinator (SEC).
- At 5:03 p.m. the SEC (at the TSC, which was activated at 4:03 p.m.) declared a Site Emergency (equivalent to the standard classification of "Site Area Emergency") based on the loss of a safety system required for Mode 3 (hot shutdown).
- At 7:12 p.m. the SEC declared a General Emergency based on the failure of all three fission-product barriers. Indications of loss of containment (the third barrier) had been received about 10 minutes earlier.

The licensee's declarations of emergency classifications during the exercise were appropriate, timely, and consistent with the procedurally defined EALs.

No violations or deviations were identified.

6. Notification Methods and Procedures (82301)

This area was observed to determine whether procedures had been established for notification of State and local response organizations and plant emergency personnel by the licensee, and whether the content of initial and follow-up messages to response organizations was established.

The inspector observed that notification methods and procedures were established and used in a timely manner to provide information regarding the emergency conditions to Federal, State, and local response organizations, and to alert the licensee's augmented emergency response organization. Inspection also disclosed that the licensee initiated notification of the State and counties within the 15-minute time regime following declaration of each emergency classification. Periodic updating of offsite organizations was consistently performed during the exercise.

No violations or deviations were identified.

7. Emergency Facilities and Equipment (82301)

This area was observed to determine whether adequate emergency facilities and equipment to support an emergency response were provided and maintained pursuant to 10 CFR 50.47(b)(8), Paragraph IV.E of Appendix E to 10 CFR Part 50, and specific guidance promulgated in Section II.H of NUREG-0654 (Revision 1).

The inspector observed activation, staffing, and operation of the emergency response facilities (ERFs) as well as the use of equipment therein. ERFs used by the licensee during the exercise included the exercise Control Room, TSC, OSC, and EOF. The latter three ERFs were activated within the time limits specified in the Emergency Plan.

a. Exercise Control Room

The inspector observed that, following review and analysis of the accident events, operations personnel acted promptly to initiate appropriate responses to the simulated emergency. Emergency procedures were available and followed.

The exercise Control Room was a special room near the TSC which was designed to avoid the overcrowding and potential for operational interference typically observed when a real Control Room is used for exercise play. The licensee was continuing in 1991 to evaluate the possibility of using the near-site Control Room simulator to "drive" future exercises at the Harris Plant (and at the Brunswick and

Robinson Plants as well). In discussions of this matter with licensee representatives, the inspector referenced the strongly positive experiences of certain other Region II licensees in conducting simulator-based exercises, which typically provide greatly enhanced realism and training value for the participants.

b. Technical Support Center

The TSC was declared operational 35 minutes after the Alert classification. Facility personnel appeared to be cognizant of their emergency duties, authorities, and responsibilities. Particularly noteworthy was the tenacity exhibited by TSC as well as Control Room personnel in their efforts to mitigate accident conditions and restore plant stability.

Plant status briefings at the TSC were well organized, informative, and regularly conducted by the SEC. The command and control of facility operations by the SEC maintained the effectiveness of the various emergency assessment teams.

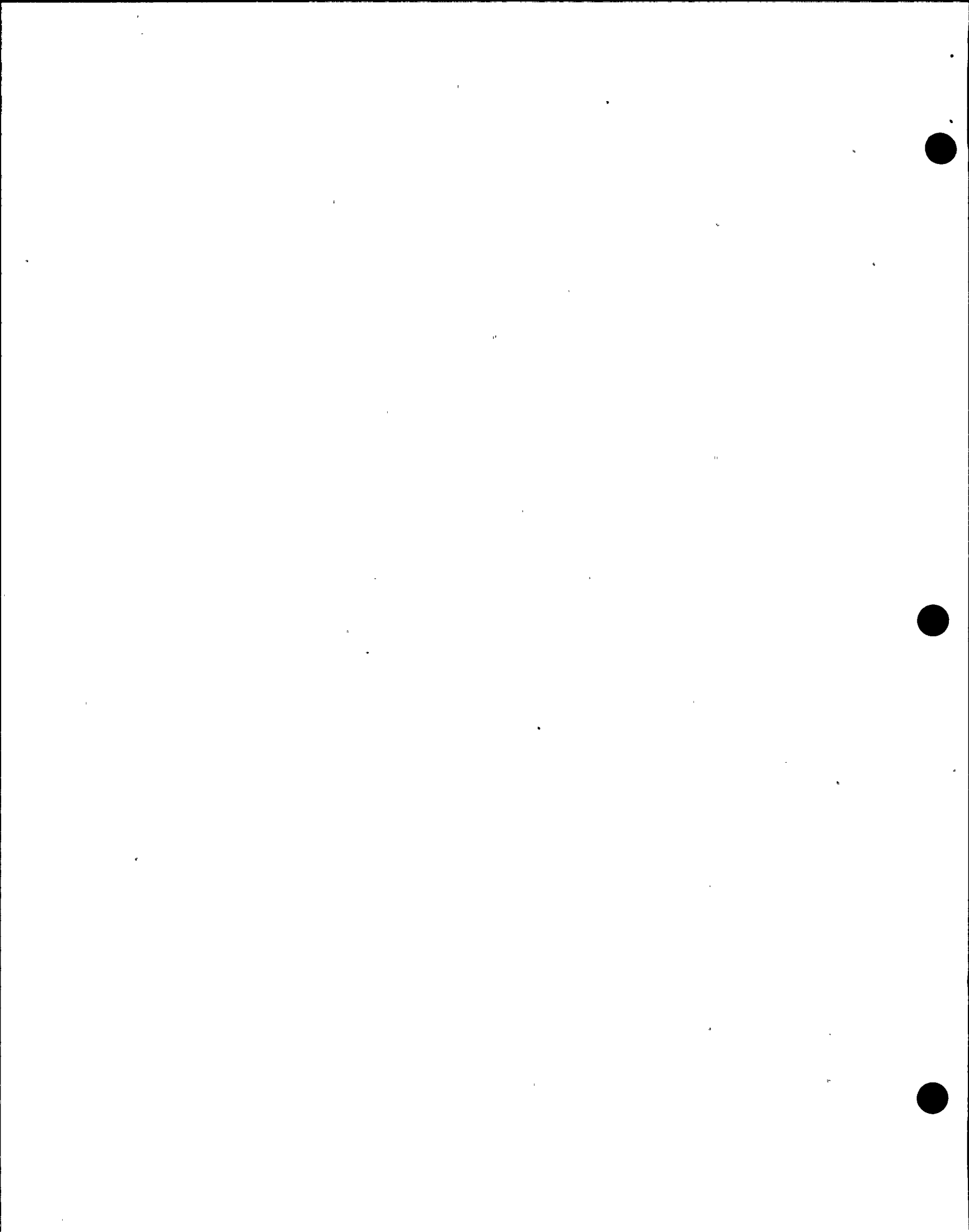
The following inspector observation suggested a possible area for improvement:

- o Onsite radiological data were not tracked and trended in a manner that would have facilitated the resolution of conflicts in field team measurements. Radiological survey data from onsite field teams were not integrated on a site map or other display that would have allowed the dose assessment team to gain an overall "picture" of the dose rates. Although field survey data were being transmitted to the TSC, this absence of an integrated data management methodology caused the dose assessment team to rely on memory for onsite radiological data when determining travel routes for relief shifts and repair teams. The attendant confusion finally resulted in the assignment of a survey team to travel the site perimeter to map the radiological conditions. Although such a survey was appropriate in any case, an integrated approach to data management would have more clearly defined the radiological conditions from the time the release started.

c. Operational Support Center

The OSC was fully activated 25 minutes after the Alert declaration. The inspector observed that the Damage Control Coordinator was very effective in assembling teams for tasks directed by the TSC, in maintaining team awareness, and in addressing health physics requirements with the Radiological Control Coordinator.

At approximately 7:05 p.m., a radiological release began, and the OSC radiation level increased to 11 mR/hr. Within about five minutes, the OSC was relocated to the Waste Processing Building.





This transfer was very efficiently accomplished and indicative of thorough preparation and training.

d. Emergency Operations Facility

The EOF was declared operational at 5:09 p.m., approximately 40 minutes after the SEC's order to activate. The Emergency Response Manager (ERM) exhibited exemplary command and control of facility operations, and provided informative status updates to the EOF staff at 30-minute intervals.

The operations at the near-site EOF principally involved support to the plant emergency organization and interface with cognizant governmental authorities; those tasks were accomplished capably. The facility was well designed and equipped, enhancing the staff's capability to support and augment the response to the simulated emergency. Security/access control was observed to be appropriately established and maintained. Communications with other ERFs were reliable. Status boards and other graphic aids were strategically located and well maintained.

The following inspector observation suggested a possible area for improvement:

- ° The default value for release duration in the licensee's dose projection system was one hour. The use of this default value for projected doses was unquestioned by the EOF staff (and the TSC staff as well). This resulted in highly nonconservative dose projections because of the use of an unrealistically short release duration. At the outset of a major release, the licensee's dose projection would potentially constitute the primary basis for deriving the protective action recommendation (PAR) for the public. It would seem highly desirable for dose projection personnel (at both the EOF and TSC) to solicit release duration estimates from the Operations staff. (It should be noted that in this particular exercise scenario, the magnitude of the release was great enough that even the one-hour default value produced projected thyroid doses sufficiently high to warrant a PAR to evacuate within a five-mile radius of the plant.) This matter was discussed in detail during the Exit Interview.

No violations or deviations were identified.

8. Accident Assessment (82301)

This area was observed to determine whether methods, systems, and equipment for assessing and monitoring actual or potential offsite consequences of radiological emergency conditions were in use as required by 10 CFR 50.47(b)(9), Paragraph IV.B of Appendix E to 10 CFR Part 50, and specific criteria in Section II.I of NUREG-0654 (Revision 1).

The accident assessment program included an engineering assessment of plant status and an assessment of radiological hazards to both onsite and offsite personnel resulting from the simulated accident. Particularly at the TSC, the inspector observed that the engineering assessment staff was aggressive in accident mitigation efforts and repeatedly identified the important success paths. Although the scenario prevented these accident management efforts from succeeding, the assessment team developed several novel approaches to reducing the release rate.

The activities of onsite and offsite radiological monitoring teams were not observed by the NRC during this inspection.

No violations or deviations were identified.

9. Protective Response (82301)

This area was observed to determine whether guidelines for protective actions, consistent with Federal guidance, were developed and in place, and whether 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 Section II.J of NUREG-0654 (Revision 1).

The inspector verified that the licensee had and adequately used emergency procedures for formulating PARs for the offsite populace within the 10-mile emergency planning zone. The inspector observed that protective actions were initiated for onsite personnel following the Alert declaration by conducting an accountability of those personnel inside the Protected Area. A second accountability was conducted immediately following the Site Emergency declaration, after which an evacuation of nonessential plant personnel occurred. Both accountability processes were completed within 30 minutes.

In accordance with NRC requirements, the heating, ventilation, and air-conditioning (HVAC) systems for the TSC and EOF each had the capability to switch to filtered, pressurized operation (emergency mode) to assure continued radiological habitability in the event of an airborne release of radioactivity. While both HVAC systems included intake detectors designed to automatically switch to the emergency mode when airborne radiation levels exceeded a preset value, reliance on this "autostart" feature was not prudent when a major radiological release was known to be occurring. At the TSC, the inspector observed that manual actuation of the emergency mode of HVAC was not implemented or even considered. At the EOF, the Radiological Control Manager decided to manually actuate the emergency ventilation mode about one hour after the release started. This identical issue surfaced during the 1989 exercise at the licensee's Robinson Plant, and was tracked as Inspector Follow-up Item 50-261/89-27-06. At Robinson, a procedural change was implemented to specify manual actuation of the emergency ventilation mode whenever the TSC and/or EOF was activated, but it appeared that this "good practice"

was not implemented on a company-wide basis. This matter was discussed in detail during the Exit Interview.

No violations or deviations were identified.

10. Exercise Critique (82301)

The licensee's critique of the emergency exercise was observed to determine whether weaknesses 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), Paragraph IV.F of Appendix E to 10 CFR Part 50, and specific guidance promulgated in Section II.N of NUREG-0654 (Revision 1).

The inspector observed the licensee's controller critique conducted the day following the exercise. The subject critique involved a detailed discussion and analysis of deficiencies identified during the exercise. All substantive findings were documented for review and correction. The respective corrective actions implemented to address these findings will be reviewed during future inspections. A formal presentation of the critique results was made to licensee management and principal exercise players on September 12, 1991.

11. Federal Emergency Management Agency (FEMA) Report

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

12. Exit Interview

The inspection scope and results were summarized on September 12, 1991, with those persons indicated in Paragraph 1. The team leader described the areas inspected and discussed in detail the inspection results. Although proprietary information was reviewed during this exercise, none is contained in this report. Dissenting comments were not received from the licensee.

Attachment (8 pages):  
1991 Shearon Harris Exercise Objectives  
and Narrative Summary of Scenario

## 09/10/91 HNP EXERCISE OBJECTIVES

	APPLICABILITY				
	<u>TSC</u>	<u>OSC</u>	<u>MCR</u>	<u>EOF</u>	<u>OTHR</u>
1. Demonstrate the ability to detect accident conditions, assess and project radiological consequences, and formulate near term mitigating actions.	X		X	X	
2. Demonstrate the ability to identify and classify the emergency in accordance with the Emergency Plan.	X		X		
3. Demonstrate the ability of the Control Room staff to perform accident assessment and implement those appropriate mitigating actions necessary to place the plant in a safe and stable condition.				X	
4. Demonstrate the adequacy of procedures for alerting, notifying, and mobilizing on-site and off-site emergency response organization personnel.	X		X	X	
5. Demonstrate the timeliness and adequacy of the information provided in the initial notifications to state and county agencies.	X		X	X	
6. Demonstrate the ability to provide follow-up notifications to the state and county agencies.	X		X	X	
7. Demonstrate the capability to make timely and accurate notifications to the Nuclear Regulatory Commission.	X		X	X	
9. Demonstrate the ability to augment the on-shift emergency organization within the time limits specified within the emergency plan and implementing procedures (during normal working hours).	X	X	X	X	
10. Demonstrate the adequacy of the Technical Support Center in providing accident assessment and mitigation, dose assessment, and communication/notification activities.	X				
11. Demonstrate the adequacy of the Operations Support Center in providing additional manpower support and coordination.		X			
12. Demonstrate the adequacy of the Emergency Operations Facility in providing off-site dose assessment, environmental monitoring, protective action recommendations, and evaluation/coordination of off-site activities.					X
13. Demonstrate the ability to communicate between emergency response facilities, as well as environmental monitoring teams.	X	X	X	X	X <sup>1</sup>

## 09/10/91 HNP EXERCISE OBJECTIVES

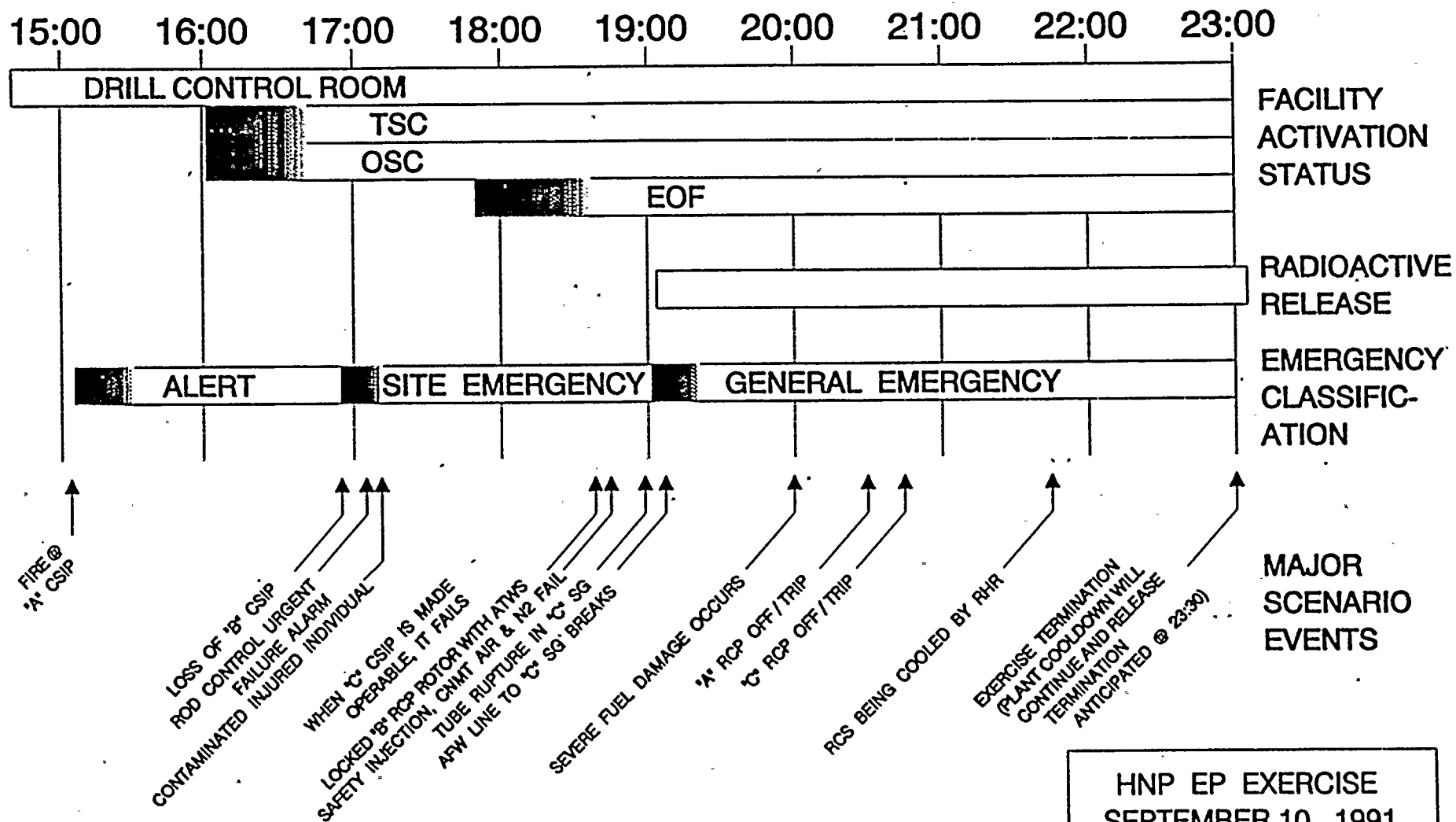
	APPLICABILITY				
	<u>TSC</u>	<u>OSC</u>	<u>MCR</u>	<u>EOF</u>	<u>OTHR</u>
14. Demonstrate that the radiological, meteorological, and process data transmittal to the Technical Support Center and Emergency Operations Facility is adequate.	X		X	X	
15. Demonstrate the adequacy of emergency kits and equipment in emergency response facilities.	X	X	X	X	X <sup>1</sup>
17. Demonstrate the ability to perform rumor control activities.					X <sup>1</sup>
18. Demonstrate the adequacy of the equipment utilized for off-site radiological monitoring.				X	
19. Demonstrate the ability to formulate appropriate off-site protective action recommendations.	X			X	
20. Demonstrate the ability to perform on-site accountability as required by the emergency plan. (during off-normal working hours).	X	X	X		X <sup>2</sup>
21. Demonstrate the ability to evacuate nonessential personnel from the Protected Area and on-site monitoring and decontamination of evacuees (during off-normal working hours). Release of nonessential personnel from the site will be simulated.			X		X <sup>2</sup>
22. Demonstrate that emergency exposure control procedures have been established and utilized in the protection of emergency workers.	X	X	X	X	
23. Demonstrate the capability to monitor personnel and equipment for contamination.		X			
24. Demonstrate proper procedures for fire brigade response to the type of fire chosen for the exercise.			X		X <sup>3</sup>
25. Demonstrate the capability for providing on-site first aid.	X				X <sup>3</sup>
26. Demonstrate that adequate control measures have been established for plant access control. (Once the objective has been demonstrated, normal site access will be restored)	X				X <sup>4</sup>
28. Demonstrate the ability to transport radiologically affected personnel to off-site medical support facilities.	X	X			X <sup>3,4</sup>
30. Demonstrate the ability to coordinate off-site radiological monitoring activities.	X			X	

## 09/10/91 HNP EXERCISE OBJECTIVES

	APPLICABILITY				
	<u>TSC</u>	<u>OSC</u>	<u>MCR</u>	<u>EOF</u>	<u>OTHR</u>
33. Demonstrate the proper procedures and use of protective measures for entering a Radiologically Controlled Area under abnormal radiological conditions.	X				
34. Demonstrate the capability to coordinate the preparation, review, and release of information for the news media.				X	X <sup>1</sup>
35. Demonstrate the ability to coordinate news releases with the state and county personnel.					X <sup>1</sup>
37. Demonstrate the participation of local government agencies in emergency response.					X <sup>5</sup>
38. Demonstrate the full participation of state government agencies in emergency response.					X <sup>5</sup>
42. Demonstrate the ability to exercise the emergency plans for the 50-mile ingestion pathway Emergency Planning Zone.					X <sup>5</sup>

- 1 - HCC/JIC
- 2 - All non-exempt site personnel
- 3 - Fire Brigade/First Aid Team
- 4 - Security Team
- 5 - Scenario and liaison with local support agencies


# EXERCISE SCENARIO TIME LINE



INITIAL CONDITIONS: 100 % POWER, ALL EQUIPMENT OPERATING PROPERLY, NEAR THE END OF CORE LIFE, 108 DAY CONTINUOUS RUN

FEMA 09/11/91 INGESTION PATHWAY TABLETOP EXERCISE IS BASED ON POSTULATED RADIOLOGICAL CONDITIONS EXISTING ON SEPTEMBER 12, 1991 WHICH ARE A RESULT OF THIS ACCIDENT SCENARIO.

HNP EP EXERCISE  
SEPTEMBER 10, 1991

 INDICATES TIME FRAME OVER WHICH ACTIVATION OR CLASSIFICATION IS EXPECTED TO OCCUR.

SEPTEMBER 10, 1991 EXERCISE SCENARIO NARRATIVE (15:00 - 23:00)

Page 1 of 3

- 15:00 The Exercise begins in the Drill Control Room. The plant has been on line for 108 consecutive days. The plant is operating at 100% power. All Technical Specification related equipment is operating properly.
- 15:03 A fire occurs which makes the "A" Charging Safety Injection Pump (CSIP) inoperable. The operations staff will dispatch the Fire Brigade to mitigate the affects of the fire. This fire affecting safety related equipment meets the ALERT emergency action level criteria.
- 15:25 An ALERT should be declared by this time and activation of the TSC and OSC will begin.
- 16:40 TSC and OSC activation is anticipated by this time.
- 16:55 "B" CSIP trips due to a mechanical fault. The operations staff will investigate and determine that both CSIPs are not functional. This meets the SITE EMERGENCY emergency action level for a loss of a function required for Mode 3. This will force a plant shutdown as required by technical specification 3.0.3.
- 17:05 A "Rod Control Urgent Failure" annunciator is received. This prevents the operations staff from performing a controlled reactor shutdown. The plant will remain at power while troubleshooting the problem.
- 17:15 A SITE EMERGENCY should be declared by this time and EOF resources will be requested.
- ≈17:15 As a result of the Site Emergency a Site Evacuation will be performed. Upon hearing the plant alarm for the evacuation a worker carrying a bag of radioactive waste falls down a flight of stairs in the Fuel Handling Building. He will fracture his upper leg during the fall and become contaminated. The individual is suffering from shock. His injuries will require off-site medical attention.
- 18:30 EOF activation is anticipated by this time.
- 18:40 The "B" Reactor Coolant Pump experiences a locked rotor which should result in an automatic reactor trip. The reactor does not trip due to both reactor trip breakers being mechanically bound. A small amount of fuel overheating and damage will occur as a result of the transient. The operations staff will locally trip the reactor via the rod drive motor generator breakers.



- 18:42 When the reactor is locally tripped the RCS pressure transient will result in actuation of Safety Injection. Reactor vessel level will fall as a result of no CSIP (High Head) flow to the reactor.
- 18:45 The Instrument Air isolation valve to Containment and the Nitrogen isolation valve to Containment can not be reopened after shutting in response to the Safety Injection. This results in a loss of RCS pressure control capabilities.
- 18:57 A Steam Generator Tube rupture occurs in "C" Steam Generator.
- 19:05 The Auxiliary Feedwater line to "C" Steam Generator breaks. This combined with the tube rupture results in Reactor Coolant being released into the steam tunnel. An off site radioactive release begins. Radiation levels will prevent personnel access to the steam tunnel.
- The main steam line monitors indicating >20 mR/hr and plant operators will be responding to the Steam Generator Tube Rupture using procedure EOP-PATH-2 which is indicative of a breach of the Fuel and RCS fission product barriers. The Containment fission product barrier is breached as a result of a Feedwater break outside of Containment with primary to secondary leakage greater than 10 GPM. This meets the criteria for declaration of a GENERAL EMERGENCY.
- The lack of charging pumps results in an inability to add water to the reactor coolant system until the pressure has been reduced to the point where the low pressure shutdown cooling (RHR) pumps can be used.
- The plant operations staff will be cooling down and depressurizing the reactor coolant system to eventually terminate the release. The depressurization will be limited by the failures of the instrument air system to containment and of the back-up nitrogen supply.
- 19:25 A General Emergency should have been declared by this time.
- 20:00 The inability to add adequate make-up water to the RCS results in significant reactor core uncover with extensive core damage occurring at approximately this time.

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SEPTEMBER 10, 1991 EXERCISE SCENARIO NARRATIVE (15:00 - 23:00)

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Page 3 of 3

- 20:29 The "A" Reactor Coolant Pump is lost due to seal damage.
- 20:44 The "C" Reactor Coolant Pump is lost due to seal damage.
- ≈23:00 The exercise will be terminated with plant cool down progressing and release termination anticipated for 23:30. On September 11, 1991 the State of North Carolina will continue with this scenario while performing an ingestion pathway table top exercise as described on the attached page.

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SEPTEMBER 11, 1991 INGESTION PATHWAY TABLE TOP

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Page 1 of 1

The State of North Carolina will conduct an ingestion pathway table top exercise using postulated data for September 12, 1991.

The data used for this table top will be based on the Sept. 10, 1991 HNP scenario plus the following events which occurred between 23:00 Sept. 10 and 08:00 Sept. 12, 1991.

SEPTEMBER 10, 1991

- 23:10 Shutdown cooling (RHR) is lost and the projected time for release termination is extended.
- 23:30 The reactor core is heating up and the radioactive release from the plant is increasing. Repair efforts are ongoing.

SEPTEMBER 11, 1991

- 02:06 Shutdown cooling has been established and the reactor is being cooled down.
- 03:00 The radioactive release from the plant has been terminated and no further releases are anticipated.

SEPTEMBER 12, 1991

- 08:00 The Harris plant staff along with assistance from other nuclear industry experts have installed a temporary repair to the "C" Steam Generator Auxiliary Feedwater line restoring one barrier to the release of fission products from the plant. Repair and recovery actions are continuing at the Harris Site.