



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

MAY 05 1988

Report Nos.: 50-269/88-09, 50-270/88-09, 50-287/88-09

Licensee: Duke Power Company
 422 South Church Street
 Charlotte, NC 28242

Docket Nos.: 50-269, 50-270, License Nos.: DPR-38, DPR-47,
 50-287 DPR-55

Facility Name: Oconee Nuclear Station

Inspection Conducted: April 13-15, 1988

Inspector: A. L. Cunningham 04/24/88
 Date Signed

Accompanying Personnel: B. Bonser
 A. Gooden
 W. Orders
 M. Stein

Approved by: T. R. Decker 5/2/88
 T. R. Decker, Section Chief
 Division of Radiation Safety and Safeguards
 Date Signed

SUMMARY

Scope: This routine, announced inspection involved observation and evaluation of the annual radiological emergency preparedness exercise.

Results: No violations or deviations were identified; however, an exercise weakness addressing emergency classification was identified (Paragraph 8).

REPORT DETAILS

1. Persons Contacted

Licensee Employees

- *M. Tuckman, Station Manager
- *R. Sweigant, Superintendent, Operations
- *L. Wilkie, Superintendent, Integrated Services
- *J. Davis, Superintendent, Technical Services
- *W. Foster, Superintendent, Maintenance
- R. Roach, Administrative Supervisor
- *R. Harris, System Emergency Planner
- *B. McRee, Corporate Emergency Planner
- *C. Jennings, Site Emergency Coordinator
- T. Kelley, Fire Protection Specialist
- *R. Leonard, McGuire Emergency Planner
- *D. Simpson, Catawba Emergency Planner
- R. Smith, Analytical Support Supervisor
- *F. Owens, Compliance Shift Supervisor
- S. Bryant, Nuclear Security Specialist
- *S. Adams, Corporate Communications
- *R. Bowman, Corporate Communications
- *C. Younge, Station Health Physicist

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

NRC Resident Inspector

- *P. Skinner

*Attended exit interview

2. Exit Interview

The inspection scope and findings were summarized on April 15, 1988, with those persons indicated in Paragraph 1 above. The inspector described the areas evaluated and discussed in detail the inspection findings listed herein. Particular emphasis was directed toward the exercise weakness discussed in Paragraph 8, below. No dissenting comments were received from the licensee. 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

No previous emergency preparedness enforcement matters remained outstanding.

4. Exercise Scenario (82301)

The scenario for the emergency exercise was reviewed to assure that provisions were made to test the integrated capability and a major portion of the basic elements defined in the licensee's emergency plan and organization pursuant to 10 CFR 50.47(b)(14), Paragraph IV.F of Appendix E to 10 CFR 50, and specific guidance promulgated in Section II.N of NUREG-0654.

The scenario was reviewed in advance of the exercise and discussed in detail with licensee representatives on several occasions. While no major scenario problems were identified, several inconsistencies became apparent during the exercise. The inconsistencies, however, failed to detract from the overall performance of the licensee's emergency organization.

The scenario developed for this exercise was detailed, and fully exercised the onsite emergency organization. The scenario provided sufficient information to the State, counties, local government and Federal agencies consistent with the scope of their participation in the exercise. The licensee demonstrated a significant commitment to training and personnel through use of controllers, evaluators, and specialists participating in the exercise. The controllers provided adequate guidance throughout the exercise. Neither prompting nor undue interaction between controllers and players was observed.

The scenario developed for the fire drill adequately exercised the participating groups of the licensee's organization and the offsite support agency. The plant Fire Brigade, Medical Emergency Response Team (MERT), and assigned security demonstrated effective training in their integrated approach to management and control of the simulated fire, and interaction with the offsite fire department assisting them during the drill. Neither prompting nor undue interaction between controllers and players was observed during the drill.

No violations or deviations were identified.

5. Assignment of Responsibility (82301)

This area was observed to assure that primary responsibilities for emergency response by the licensee were specifically established, and that adequate staff was available to respond to an emergency pursuant to 10 CFR 50.47(b)(1), Paragraph IV.A of Appendix E to 10 CFR 50, and specific guidance promulgated in Section II.A of NUREG-0654.

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; however, because of the scenario scope and conditions, long-term or continuous staffing of the emergency response organization was not required. Discussions with licensee representatives and detailed review

of the site Radiological Emergency Plan indicated that a sufficient number of trained technical personnel were available for continuous staffing of the augmented emergency organization, if needed.

The inspector also observed activation, staffing, and operation of the emergency organization in the Technical Support Center (TSC) and Operations Support Center (OSC). The Corporate Management Center was not activated during this exercise. The required staffing and assignment of responsibility at the activated facilities were consistent with the licensee's Emergency Plan and approved Implementing Procedures.

No violations or deviations were identified.

6. Onsite Emergency Organization (82301)

The licensee's onsite emergency organization was observed to assure that the following requirements were implemented pursuant to 10 CFR 50.47(b)(2), Paragraph IV.A of Appendix E to 10 CFR 50, and specific guidance promulgated in Section II.B of NUREG-0654: (1) unambiguous definition of responsibilities for emergency response; (2) provision of adequate staffing to assure initial facility accident response in key functional areas at all times; (3) specification of onsite and offsite support organizational interactions.

The inspector observed that the initial onsite emergency organization was adequately defined, and that staff was available to fill key functional positions within the organization. Augmentation of the initial emergency response organization was accomplished through use of onshift personnel. An assigned Shift Supervisor assumed the duties of Emergency Coordinator promptly upon initiation of the simulated emergency, and directed the response until formally relieved by the Station Manager.

Required interactions between the licensee's emergency response organization and State and local support agencies were adequate and consistent with the scope and objectives.

No violations or deviations were identified.

7. Emergency Response Support and Resources (82301)

This area was observed to determine that arrangements for requesting and effectively using assistance resources had been made, that arrangements to accommodate State and local staff at the licensee's near-site Emergency Operations Facility had been made, and that other organizations capable of augmenting the planned response had been 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.

The State of South Carolina's involvement in the subject annual emergency preparedness exercise was limited to partial participation. Oconee and Pickens Counties, however, fully participated in the exercise.

Representatives of the State and above cited counties were accommodated in the licensee's onsite News Media Center. Licensee contact with offsite organizations was prompt, effective, and consistent with the scope and objectives of the exercise. Assistance resources from State and local agencies were available to the licensee consistent with the scope of their participation in the exercise.

No violations or deviations were identified.

8. Emergency Classification System (82301)

This area was observed to assure that a standard emergency classification and action level scheme was in use by the nuclear facility licensee pursuant to 10 CFR 50.47(b)(4), Paragraph IV.C of Appendix E to 10 CFR 50, specific guidance promulgated in Section II.D of NUREG-0654, and guidance recommended in NRC Information Notice 83-28.

An Emergency Action Level matrix and respective procedures were used to identify and classify an emergency and escalate the plant status to more severe emergency classifications as the simulated accident sequence progressed. The inspector observed, however, that the initial classification of Alert was incorrect, although it was based on a valid Emergency Action Level, namely, a LOCA greater than 50 gpm. At the time of the Alert declaration, it was also observed, that consistent with the scenario, the control rods remained withdrawn despite the concurrent existence of the following conditions: (1) reactor high pressure trip signals were present due to loss of steam generator feed; (2) control rods were manually tripped from the control board; (3) conversely, attempts to manually insert the control rods failed; and (4), the NEOs were ordered to open the control rod breakers. In accordance with Enclosure 4.1.5 to Procedure RP/O/B/1000/01, Loss of Shutdown Functions, the appropriate declaration should have been Site Area Emergency, based upon the following: two or more RPS channels tripped; and control rods remained withdrawn and could neither be manually tripped nor inserted. These findings were discussed in detail with cognizant licensee representatives both prior to and during the exercise critique. Licensee representatives were informed that the subject findings constituted an exercise weakness.

Exercise Weakness 50-269/88-09-01, 50-270/88-09-01, 50-287/99-09-01: Incorrect classification of an emergency declaration. A response to the finding will be made by the licensee following receipt of the subject inspection report.

No violations or deviations were identified.

9. Notification Methods and Procedures (82301)

This area was observed to assure that procedures were established for notification of State and local response organizations and emergency personnel by the licensee, and that the content of initial and followup

messages to response organizations were established. This area was further observed to assure that means to provide early notification to the populace within the plume exposure pathway were established pursuant to 10 CFR 50.47(b)(5), Paragraph IV.D of Appendix E to 10 CFR 50, and specific guidance promulgated in Section II.E of NUREG-0654.

The inspector observed that notification methods and procedures were established and available for use in providing information regarding the simulated emergency conditions to Federal, State, and local response organizations, and to alert the licensee's augmented emergency response organization. Notification of the State of South Carolina, and designated local offsite organizations was completed within 15 minutes following declaration of all emergency classifications involved. The prompt notification system (PNS) for alerting the public within the plume exposure pathway EPZ was actuated during this exercise.

No violations or deviations were identified.

10. Emergency Communications (82301)

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

The inspectors observed communications within and between the licensee's emergency facilities, the licensee and offsite agencies, and the radiological field monitoring teams and the TSC. Inspectors also observed information flow among the various groups within the licensee's emergency organization. Emergency communications involving notification of the State, local agencies, and the NRC of emergency classifications discussed above, were adequate and consistent with the Radiological Emergency Plan and Implementing Procedures.

Communications between the TSC and radiological field monitoring teams was evaluated and determined to be adequate. Communications, once established with each team, was good throughout the exercise. In those instances where teams were unable to communicate directly with the TSC due to building structures or topography, information was transmitted via relay to teams close to the TSC.

No violations or deviations were identified.

11. Emergency Facilities and Equipment (82301)

This area was observed to assure that 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 50, and specific guidance promulgated in Section II.H of NUREG-0654.

The inspectors observed activation, staffing, and operation of the emergency response facilities, and use of the equipment therein. Facilities used by the licensee during the exercise included the Control Room (Simulator), TSC, and OSC. The Corporate Management Center (CMC) was not activated during this exercise. Note also that the Simulator was used in lieu of an assigned unit Control Room; however, the term Control Room will be used throughout the subject Inspection Report.

- a. Control Room - The Control Room was used and effectively managed throughout the exercise. The inspector observed that following review and analysis of the sequence of accident events, Control Room operations personnel acted promptly to initiate required responses to the simulated emergency. Emergency procedures were readily available, routinely followed, and factored into accident assessment and mitigation exercises.

Control personnel involvement was essentially limited to those personnel assigned routine and special operational duties. Effective management of personnel gaining access to the Control Room precluded overcrowding, and maintained an ambient noise level required for orderly conduct of operations under emergency conditions.

Control Room personnel were cognizant of their duties responsibilities, and authorities. The staff demonstrated proficient use of routine operating and emergency operating procedures (EOPs) in response to plant transients and emergency conditions. Note, however, that the initial emergency event declared was incorrectly classified as an Alert. Consistent with the sequence of scenario events, and Enclosure 4.1.5 to Procedure RP/O/B/1000/01, the correct classification should have been Site Area Emergency. This item is fully discussed in Paragraph 8, above.

It was observed that data and information provided during the course of the exercise sequence and conditions were readily managed by the Emergency Coordinator and the Control Room staff in implementing appropriate actions in a timely manner. The Control Room staff demonstrated the capability to effectively assess the initial conditions and implement required mitigating actions. It was observed that a bound log was provided and maintained for documenting plant conditions and activities of the Emergency Coordinator and cognizant Shift Supervisor throughout the exercise.

- b. Technical Support Center - The TSC was activated and promptly staffed following notification by the Emergency Coordinator of the simulated emergency conditions leading to the apparent Alert classification (refer to Paragraph 8, above). The facility staff appeared to be cognizant of their emergency duties, authorities, and responsibilities. Required operations at the facility proceeded in an orderly manner. The facility was provided with adequate equipment for support of the assigned staff. TSC security was promptly established and maintained. Security maintained a log or otherwise

accounted for all personnel assigned to the facility. Dedicated communicators were assigned to the facility and maintained all status boards current. Effective communications were maintained with the Control Room and OSC.

Inspection disclosed the following additional findings, namely: (1) engineering, maintenance, and other technical support functions were readily implemented and factored into problem solving exercises; (2) assumption of duties by the Emergency Coordinator was definite and firm; (3) transfer of certain emergency responsibilities from the Control Room to the TSC was promptly implemented; (4) briefings of the TSC staff were frequent, and consistent with changes in plant status and related emergency conditions; and (5) accountability, including identifying missing personnel, was readily implemented within the accepted time regime and was consistent with the scope and objectives of the scenario.

- c. Operations Support Center - The OSC was promptly staffed following activation of the Emergency Plan by the Emergency Coordinator. An inspector observed that teams were promptly assembled, briefed, and dispatched. The OSC Supervisor appeared to be cognizant of his duties and responsibilities. The OSC staff was frequently updated on plant status and impact of the accident sequence by the OSC Supervisor. Status boards defining the following were maintained and frequently updated: (1) emergency classification and specific plant status; (2) listings of investigative/repair teams, their respective tasks, time of deployment/reentry, and return to the facility.

No violations or deviations were identified.

12. Accident Assessment (82301)

This area was observed to assure 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 50.47(b)(9), Paragraph IV.B of Appendix E to 10 CFR 50, and specific guidance promulgated in NUREG-0654, Section II.I.

The accident assessment program included an engineering assessment of plant status, and an assessment of radiological hazards to onsite and offsite personnel resulting from the accident. During the exercise, the engineering accident assessment team functioned effectively in analyzing plant status to provide recommendations to the Emergency Coordinator concerning mitigating actions required to reduce damage to plant systems and equipment, mitigation of releases of radioactive materials, and termination of the emergency condition.

Radiological assessment activities involved several groups. An inplant group estimated the radiological impact within the plant based upon inplant monitors and onsite measurements. Field radiological monitoring teams were dispatched by the licensee to determine the level of

radioactivity in those areas within the influence of the plume, and provide data for determining dose projections derived therefrom.

Dose assessment and projections were conducted in the TSC based upon data derived from inplant leakage sources, and offsite radiological measurements conducted by field monitoring teams. The inspector assigned to evaluate offsite radiological monitoring teams observed two of the six teams deployed by the licensee. The referenced teams observed were designated as Sampling Van No. 1, and Survey Team Charlie, respectively. Field monitoring personnel demonstrated acceptable health physics practices and contamination control in conducting field measurements and sample analysis. Personnel readily located sampling points, and promptly reported monitoring results and data to the TSC. Additional findings disclosed that sampling and monitoring vehicles provided adequate accommodations for personnel and assigned equipment. The findings listed below were also disclosed.

- a. Communications problems were observed during commencement of the exercise; however, the problems were promptly resolved either by equipment replacement and/or personnel awareness of operation of radio equipment.
- b. Prior to offsite deployment, Sample Van No. 1 personnel were not briefed regarding plant status/conditions, meteorological data, radio channel(s) designated for emergency communication, acceptable health physics practices and contamination control, and other information deemed essential to assure effective completion of their assigned mission.

The latter finding defined above was discussed in detail with cognizant licensee representatives prior to and during the exercise critique conducted on April 15, 1988. The licensee was informed that the subject finding would be reviewed during subsequent exercises. The licensee stated that the item would be reviewed and corrective actions taken where indicated.

Inspector Followup Item 50-269/88-09-02, 50-270/88-09-02, 50-287/88-09-02: Briefing of offsite monitoring/sampling teams prior to deployment to assigned offsite areas.

No violations or deviations were identified.

13. Protective Response (82301)

This area was observed to determine that guidelines established for protective actions were developed and in place, and that protective actions for emergency workers including evacuation of non-essential personnel, are promptly implemented pursuant to 10 CFR 50.47(b)(10) and specific guidance promulgated in NUREG-0654, Section II.J.

The protective measures decisionmaking process was observed by the inspector. Recommendations implemented by the TSC staff were timely, effective, and consistent with the above criteria. Protective measures recommendations were provided by the licensee to the State of South Carolina as part of the exercise. It was noted that the protective actions recommended by the staff were concurred in and implemented by the State and participating counties.

No violations or deviations were identified.

14. Radiological Exposure Control (82301)

This area was observed to determine that methods for controlling radiological exposures in an emergency were established and implemented for emergency workers, and that these methods included exposure guidelines consistent with EPA recommendations pursuant to 10 CFR 50.47(b)(11), and specific guidance promulgated in Section II.K of NUREG-0654.

An inspector noted that radiological exposures were controlled throughout the exercise by issuing supplemental dosimeters to emergency workers and by conducting periodic radiological surveys in the emergency response facilities. Exposure guidelines were in place for various categories of emergency actions. Adequate protective clothing and respiratory protection were available for use as required. Consistent with the scope of the exercise, use of respiratory protection equipment by emergency response teams was simulated, except during the fire drill.

Health Physics control of radiation exposure, contamination control, and radiation area access appeared adequate. Note, however, that the offsite monitoring team assigned to Sample Van No. 1 was not briefed regarding exposure control or any other items. This finding is discussed in Paragraph 12, above. Health physics specialists were observed to thoroughly brief OSC teams prior to their deployment. Health physics personnel accompanied each repair/investigative team deployed. Dosimetry was available and was used. High range dosimeters were also available in case they were needed.

No violations or deviations were identified.

15. Public Education and Information (82301)

This area was observed to assure that information concerning the simulated emergency was made available for dissemination to the public pursuant to 10 CFR 50.47(b) (7), Paragraph IV.D of Appendix E to 10 CFR 50, and specific guidance promulgated in Section II.G of NUREG-0654.

Public information was not evaluated during the subject exercise.

No violations or deviations were identified.

16. Exercise Critique (82301)

The licensee's critique of the emergency exercise was observed to determine that shortcomings identified as part 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 50, and specific guidance promulgated in Section II.N of NUREG-0654.

A formal critique was held on April 15, 1988, with licensee management, controllers, evaluators, and NRC representatives. Findings identified during the exercise and designated for licensee corrective action were discussed. Licensee action on identified findings will be reviewed during subsequent inspections. The conduct and content of the critique were consistent with regulatory criteria and specific guidance cited above.

The NRC Evaluation Team also observed the licensee's Controller/Evaluator critique conducted immediately following the exercise on April 14, 1988. Inspection disclosed that the subject critique was comprehensive, and addressed activation, detailed operation and required functions of the emergency response facilities, events analysis and mitigation, dose assessment and projection, protective action recommendations, fire and medical emergency drills, and field monitoring. All deficiencies and indicated improvements were fully discussed and documented by licensee representatives, and prepared for presentation at the formal critique discussed above. These findings and respective corrective actions will be routinely reviewed by the NRC during the subsequent inspections and radiological emergency preparedness exercises.

17. Followup Items (92703)

(Closed) IFI (50-269/87-43-01, 50-270/88-43-01, 50-287/87-43-01): Failure to demonstrate adequate radio communications with offsite radiological environmental field teams. Inspection of communications between assigned field teams throughout the exercise disclosed that communications were adequate.

(Closed) IFI (50-269/87-43-02, 50-270/87-43-02, 50-287/87-43-02): Excessive prompting by controllers in Simulator-Control Room. Inspection disclosed an absence of prompting and undue interaction between controllers and players.

(Closed) IFI (50-269/87-43-03, 50-270/87-43-03, 50-287/87-43-03): Failure to maintain an adequate Control Room logbook. Inspection disclosed that a bound log book was provided and effectively used to record plant conditions and selected entries of Emergency Coordinator and cognizant Shift Supervisor during the exercise.

(Closed) IFI (50-269/87-43-04, 50-270/87-43-04, 50-287/87-43-04): Radiological contamination control at the OSC and TSC. Inspection disclosed that radiological contamination control at the cited facilities

was proper and consistent with the scope of the exercise. Friskers were located at controlled entrances to the cited facilities.

18. Federal Evaluation Team Report

The report by the Federal Evaluation Team (Regional Assistance Committee and Federal Emergency Management Agency, Region IV staff) concerning the activities of offsite agencies during this exercise will be forwarded by separate correspondence.

Attachment:
Exercise Scope and Objectives

Oconee Nuclear Station
1988 Exercise

I. SCOPE AND OBJECTIVES

A. Scope

The 1988 Oconee Nuclear Station exercise is designed to meet the exercise requirements of 10CFR50, Appendix E, Section IV.F. The Duke Power Technical Support Center, Operational Support Center, and control room will participate fully. The Duke Power Crisis Management Center will not participate except as needed to support realistic participation by other organizations. Oconee and Pickens Counties will participate fully and the State of South Carolina will participate on a partial basis.

On April 14, 1988, a simulated radiological accident will be held to test the integrated capabilities and a major portion of the basic elements within the emergency plans and organizations. This exercise will simulate emergency conditions which would require response by the on-site emergency organizations. Exercise objectives are provided in Section I.B.

A formal critique involving Duke Power, NRC, and selected observers will be held April 15, 1988. This critique will be closed to the public and will be held in the Oconee Nuclear Station Administration Building, Room A-213.

B. Exercise Objectives

1. Demonstrate the ability to declare emergency classification in accordance with procedures.
2. Demonstrate the ability to notify the State and the counties within 15 minutes after declaring an emergency or after changing the emergency classification.
3. Demonstrate the ability to alert, notify, and staff the TSC and OSC facilities after declaring an Alert or higher emergency class.
4. Demonstrate the ability to notify NRC not later than 1 hour after declaring one of the emergency classes.
5. Demonstrate assembly of station personnel within 30 minutes in a simulated emergency and provide accountability for any not present at the assembly locations.

6. Demonstrate access control measures to the plant site.
7. Test communications equipment among on-site emergency facilities including plant extensions, intercoms, and the on-site radio system.
8. Test off-site communications equipment to the counties and state and to NRC including the Selective Signaling System, outside telephone lines, and the NRC Emergency Notification System.
9. Test the adequacy and operability of emergency equipment/supplies.
10. Demonstrate precise and clear transfer of responsibility from the Shift Supervisor in the Control Room to the Emergency Coordinator in the TSC.
11. Demonstrate proper use of the message format and authentication methodology for messages transmitted to states and counties.
12. Demonstrate the ability to provide data to the TSC and OSC in accordance with station procedures.
13. Evaluate the adequacy of the following assessment tools:
 1. Drawings
 2. Data Display Boards
 3. Maps
14. Demonstrate the ability to continuously monitor and control emergency worker exposure.
15. Demonstrate the ability to determine on-site radiation levels and airborne radioiodine concentrations.
16. Demonstrate the ability to develop off-site dose projections in accordance with procedures.
17. Demonstrate adequate radio communications between the off-site monitoring teams and the TSC.
18. Demonstrate the ability to locate a simulated, radioactive plume and to measure the off-site radiation levels.
19. Demonstrate the ability to provide timely and appropriate protective action recommendations to off-site officials in accordance with station procedures.

20. Demonstrate the ability to assess the incident and provide mitigation strategies in accordance with station procedures.
21. Demonstrate the adequacy of response to a medical injury involving contamination with transport to an off-site medical facility. (Contamination and/or radiation consequences.)
22. Demonstrate adequacy of response to a fire outside the protected area utilizing volunteer fire support (April 13, 1988 - separate drill).
23. Demonstrate the ability to effect an orderly evacuation of non-essential personnel.
24. Demonstrate the ability to provide accurate information to the news media in a timely manner.

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DUKE POWER COMPANY
OCONEE NUCLEAR STATION
ANNUAL EXERCISE 88-2

INITIAL CONDITIONS:

1. Unit 2 @ cold shutdown and Unit 3 @ 100% - No major problems
2. Unit 1 @ 55% due to 1B FDW Pump work. 1B feedwater pump isolated and drained for repair for suction relief valve repair.
3. Unit 1 currently operating with some failed fuel (current levels).
4. 1LWD-2 (Liquid Waste Discharge) has been disassembled for repair of clogged line. This has placed the unit under a 4 hr. Limiting Condition for Operation per T.S. 3.6.3.C beginning at 1130.
5. Unit 1 Personnel Hatch Leak Rate Test in progress.
Building entry was made to check some penetration valves the previous day at 1300 hrs. Unit is under a 72 hr. Limiting Condition for Operation.

SEQUENCE OF EVENTS:

- 1215 Performance notifies Unit 1 Supervisor that the Unit 1 Personnel Hatch has failed the Leak Rate Test
- 1230 The following items occur:
- 1) Rod 4 GP6 ejects from core
 - 2) Reactor Protective System or Operators attempt to trip Reactor, but rods do not drop
 - 3) Emergency boration is initiated; "1B" HPI (High Pressure Injection) Header flow indication is failed to "0".
 - 4) Operators attempt to manually drive rods, but all control power to rods is lost. This prevents driving rods into core.
- 1230:30 The following items occur:
- 1) "1A" Main Feedwater Pump Trips - causing a loss of Main Feedwater
 - 2) All Emergency Feedwater Pumps start - no problems
 - 3) Reactor Coolant System Pressure & Temperature will increase to Power Operated Relief Valve set point and lift the Power Operated Relief Valve. Reactor Coolant System Pressure will continue to increase and lift the Pressurizer Code Relief Valves @ 2400 psi.
- 1232 Operators arrive at Control Rod Drive Breakers in the Cable Room but are unsuccessful at tripping breakers.
Aux. Bldg. RIA's (Radiation Monitors) should be increasing to alarm setpoints.
- 1235 1) Operators deenergize Control Rod Drives at the 600 V. load centers 1X9 and 2X1. Control Rods fall into core taking Reactor sub-critical. Reactor Coolant System pressure rapidly decreases below Power Operated Relief Valve setpoint. RC-66 closes.

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ANNUAL EXERCISE 88-2
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- 1237 A loud noise is heard by Maintenance Crew in Room 61 where the repair to 1 LWD-2 is taking place. Maintenance calls Control Room to report an injury and high and increasing rad levels in Room 61. They have reported steam and air coming through the 1 LWD-2 piping.
- 1245 Site Area Emergency declared.
- 1300-1315 Both 'A' Steam Generator Start Up levels (ICS) fail low. This should not present an immediate problem due to Emergency Feedwater in operation. This failure will occur prior to reestablishing main feedwater.
- 1320-1345 General Emergency declared. Plant site should be evacuated of non-essential personnel.
- 1345 The following items occur:
1) Fire alarm received in Control Room-Group 6 Pyra Alarm (Detector 6B over 1TC)
2) 1X8 Deenergizes because feeder breaker on 1TC to 1X8 internally faults
3) 1XS1 becomes deenergized
4) Fire Brigade may be dispatched
- ~1355 Fire Brigade or operator arrives at 1TC Switchgear. No fire but lingering smoke. 1TC Breaker to 1X8 is scorched.
- 1355 Operations should then begin making lineups necessary to power up 1XS1 from 1X9 if they determine there is no fault on 1XS1.
- 1400 Status:
1) Maint. should be repairing Reactor Building Personnel Hatch
2) Maint. should be putting a closure-plate on 1LWD-2 piping.
3) Operations should be cooling down plant to Low Pressure Injection normal decay heat removal.
4) Operations should be reenergizing 1XS1 so that Low Pressure Injection can be put on.
- ~1400 If Chemistry samples are taken at 1245, results would show ~3% failed Fuel. Rate of Fuel Failure from 1245 until stopping all Reactor Coolant Pumps is 0.25% per 15 minutes.

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To be completed prior to exercise close-out:

1. Unit placed on normal decay heat removal with system depress in progress.
2. Reactor Building leaks should be repaired to stop offsite release.