



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

Report Nos.: 50-413/91-06 and 50-414/91-06

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

Docket Nos.: 50-413 and 50-414

License Nos.: NPF-35 and NPF-52

Facility Name: Catawba 1 and 2

Inspection Conducted: February 19-22, 1991

Inspector: William H. Rankin 3/15/91
for E. D. Testa Date Signed

Accompanying Personnel: W. Miller
F. Victor

Approved by: William H. Rankin 3/15/91
William H. Rankin, Chief Date Signed
Radiological Protection Branch
and Emergency Preparedness Section
Division of Radiation Safety
and Safeguards

SUMMARY

Scope:

This routine, announced inspection was to observe and evaluate the annual emergency exercise. State and local government participation was limited to communication of emergency notification messages. The licensee's Crisis Management Center did not participate. A separate medical drill was held involving transportation of a (simulated) contaminated, injured patient to the hospital.

Results:

Within the areas evaluated, one non-cited violation involving an old and new revision of a controlled Health Physics procedure was found in an Operations Support Center supply cabinet (Paragraph 8(c)). No deviations were identified. One exercise weakness was identified involving the failure to classify, make timely notification to State/local organizations, demonstrate adequate Health Physics practices and First Aid response techniques during a medical drill (Paragraphs 5 and 8(e)).

The following strengths were identified in the licensee's emergency organization: (1) use of the simulator allowed full play in a control room atmosphere with a plant experiencing a casualty, (2) extensive and effective exercise critique and self identification of items needing improvement, and (3) the Technical Support Center and Operations Support Center were spacious and ergonomically arranged.

Within the scope of the observed exercise, the licensee fully demonstrated the capability of implementing its Emergency Plan and procedures to provide for the health and safety of the public in a radiological emergency.

REPORT DETAILS

1. Persons Contacted

Licensee Employees

- *W. Barron, Director Operations Training
- *B. Caldwell, Superintendent Station Services
- *R. Casuer, Superintendent of Operations
- *J. Cox, Training Manager
- *T. Crawford, Superintendent Integrated Scheduling
- *J. Forbes, Superintendent of Technical Services
- *J. Hampton, Station Manager
- *R. Harris, Manager, Nuclear Emergency Planning
- *C. Hartzell, Compliance Manager
- *D. Kimball, Lead Shift Manager
- *P. McNamara, Station Emergency Planner
- *G. Mitchell, Production Specialist II
- *D. Simpson, Nuclear Emergency Planner
- *J. Troutman, Jr., NCMPE-1, Assistant Engineer

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

*P. Hopkins, Resident Inspector

*Attended exit interview

2. Exercise Scenario (82302)

The scenario for the emergency exercise was reviewed to determine that provisions had been made to test an integrated emergency response capability as well as the basic elements existing within the licensee, State and local Emergency Plans 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 discussed with members of the licensee's staff. The scenario developed for this exercise was adequate to exercise the onsite emergency organizations of the licensee. The final exercise data packages were distributed during a pre-exercise licensee briefing held February 19, 1991.

The inspector observed that exercise activities were carried out without controller prompting or undue interaction between controllers and players during the exercise.

No violations or deviations were identified.

3. Assignment of Responsibility (82301)

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

The inspector observed that specific emergency assignments had been made for the licensee's emergency response organization and there was adequate staff available to respond to the simulated emergency. The initial response organization was augmented by designated licensee representatives. The scenario did not require long term or continuous staffing of the emergency response organization to be demonstrated.

The inspector observed the activation, staffing, and operation of the emergency organization in the Control Room (Simulator), Technical Support Center (TSC), and the Operations Support Center (OSC). Staffing and activation were both timely and effective in the TSC and OSC. The assignment of responsibility at each of the facilities was consistent with the licensee's Emergency Plan and implementing procedures.

No violations or deviations were identified.

4. 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; and (3) specification of onsite and offsite support organization 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 organizations was accomplished through the mobilization of additional day-shift personnel. The Shift Supervisor (at the Simulator) assigned to the exercise assumed the duties of Emergency Coordinator promptly upon initiation of the simulated emergency, and directed the response until formally relieved by the Station Manager.

No violations or deviations were identified.

5. 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.

Emergency Plan Implementing Procedure No. RP/O/A/5000/01 titled "Classification of Emergency" was used to identify and classify the scenario simulated events. The Alert, Site Area Emergency and General Emergency classifications were timely and correct by procedure.

The Medical Emergency began about 10:45 a.m. with an (Simulated) injured, contaminated Nuclear Licensed Operator (NLO) who was dispatched to the "Doghouse" to investigate blowing steam. The individual was treated by the onsite Medical Emergency Response Team (MERT) and transported to an offsite medical facility. By procedure, "Classification of Emergency" Enclosure 4.1, Page 27 of 27, Event No. 4.1.10 "Other Abnormal Plant Conditions" requires a Notification of Unusual Event (NOUE) for Transportation of a contaminated, injured individual from the site to an offsite medical facility. The NOUE classification was not made, nor were the notification forms completed, nor were the State and local officials notified, as required by Procedure RP/O/A/5000/02 titled Notification of Unusual Event Enclosure 4.2.2 or Procedure RP/O/A/5000/06 (See Paragraph 8(e) for additional details of the Medical Drill).

No violations or deviations were identified.

6. 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 had 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.

The inspector observed that notification methods and procedures had been established and were used to provide information concerning the simulated emergency conditions at the Alert, Site Area Emergency and General Emergency, to Federal, State and local response organization. The procedure and notification methods were also used to alert the licensee's augmented emergency response organization. Notifications of State and designated local offsite organizations were completed (Medical Drill excepted see Paragraph 5) within 15 minutes following the declaration of the emergency event. The Alert Notification System (ANS) for alerting the public within the plume exposure pathway emergency planning zone (EPZ) was not activated during this exercise.

No violations or deviations were identified.

7. Emergency Communications (82301)

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

The inspector observed that adequate communications existed among the licensee's emergency organizations, and between the licensee's emergency response organization and offsite authorities. Field team dispatch and control via radio was monitored and deemed acceptable.

No violations or deviations were identified.

8. Emergency Facilities and Equipment (82301)

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

The inspector observed activation, staffing, and operation of the emergency response facilities. No major equipment deficiencies were observed. Facilities observed by the NRC evaluation team included:

- a. Control Room (Simulator) - The exercise control room was established outside the main Control Room in the simulator at the training center. The inspector observed that following review and analysis of the sequence of accident events, control room operation's personnel acted promptly to initiate required response to the simulated emergency. Emergency procedures were available and followed. The designated Exercise Shift Supervisor evaluated the significance of each degradation in plant conditions and quickly and continuously prioritized repair activities.

The simulator personnel followed procedures and demonstrated command and control in a quiet competent manner.

- b. Technical Support Center (TSC) - The TSC manager demonstrated effective command and control providing periodic informative briefings on plant status to the TSC staff. The facility staff appeared to be cognizant of their duties, authorities and responsibilities. The TSC was spacious and well laid out. Computer generated video screens provided rapid data summaries and trending capabilities. The display system performed well and the data was driven by simulator scenario output. When fully developed the system should provide continuous feed back of changing plant parameters. Briefings by the TSC Manager were timely, informative and concise. Noise control was effective.
- c. Operational Support Center (OSC) - The inspector observed that following the request for activation, personnel responded promptly to staff the facility. The OSC was a large ergonomically engineered facility that provided a generous area to perform OSC activities. Crafts were organized by discipline and located in designated areas. Health Physics (HP) control was evident and teams were well briefed prior to dispatch and debriefed upon returning. A total of approximately 25 teams were selected, deployed and tracked effectively by the facility. Noise control for the approximately 75

people located in the facility was effective. The HP group continually verified habitability.

Appropriate dosimetry and maintenance tools were made available prior to departure and effective team tracking was accomplished via administrative procedure. Communication with teams was maintained and a system to check on teams in intervals of approximately every 20 minutes ensured that important information such as changing plant conditions or radiation level were relayed to the teams.

The inspector while reviewing the inventory of the Emergency Supply Cabinet in the facility found two controlled copies of Procedure HP/O/B/1004/06 titled "Personnel Decontamination". One an old Revision 8 dated October 20, 1988 and the other a current Revision 9 dated February 15, 1991. This was brought to the attention of the OSC controller who immediately corrected the problem. In light of the actions, this apparent violation for failure to control and maintain current revisions of Implementing Procedure was discussed with Regional Management; and since all requirements as specified in 10 CFR Part 2, Appendix C, Section V of the NRC Enforcement Policy were satisfied, the licensee was informed that this finding was considered a non-cited violation (NCV).

NCV 50-413,414/91-06-01: Failure to control and maintain current revisions of an Implementing Procedure in the OSC supply cabinet.

- d. Crisis Management Center (CMC) - This facility was not activated during this small scale exercise.
- e. Medical Drill - The Medical Drill began about 10:45 a.m. with the simulated contaminated casualty of a Nuclear Licensed Operator. The victim received the following simulated injuries from a fall and contaminated steam release:
 - ° Second and third degree burns to the left arm and hand
 - ° Fractured Pelvis (left side)
 - ° Rib Fractures (left side) with associated lacerated spleen, and internal bleeding.
 - ° The injuries were deemed "load and go" with transportation to an offsite medical facility
 - ° Whole body contamination of approximately 200 CPM

The Medical Emergency Response Team (MERT) response was video taped to provide team feedback and to be used for training purposes.

The inspector observed the following deficiencies in the Medical Drill:

(1) Poor Health Physics Practices

- ° HP survey instruments were not turned on during the medical drill

- Air samples were not taken
- Contamination control boundaries were violated
- Plastic used for contamination control was repeatedly contaminated by personnel traffic wearing "contaminated" boots
- Donning of Anti-C clothing over "contaminated" boots contaminating clean clothing
- No control of contaminated consumable waste materials (e.g., rubber gloves)

(2) Poor First Aid Technique

- Installation of blood pressure cuff inside out rendering it useless
- Movement of victim onto a back board prior to placing and securing neck brace
- Improper lift of victim on back board
- Wrapping an unconscious non-communicative minimally contaminated victim in plastic
- Use of heavy rubber gloves prevented rapid, accurate tactile evaluations of pulse and other vital signs

The inspector intervened and requested the controller to stop the MERT team's impending use of hand held radios in a radio use restricted area (Electrical Penetration Room).

The failure to promptly classify and make timely modifications as well as failure to demonstrate adequate Health Physics Practices, First Aid Response techniques was identified as an Exercise Weakness. The licensee also identified this area as deficient and has committed to provide necessary training and redemonstrate the Medical Response.

Exercise Weakness 50-413,414/91-06-02: Failure to Classify, make timely notification to State/local organization (Paragraph 5), demonstrate adequate Health Physics Practices and First Aid Response Technique during a medical drill.

One non-cited violation and one exercise weakness were identified.

9. 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), 10 CFR 50, Appendix E, Paragraph IV.B, and specific criteria in NUREG-0654, Section II.I.

The accident assessment program included both an engineering assessment of plant status and an assessment of radiological hazards to both onsite and offsite personnel resulting from the accident. Both programs appeared effective during this exercise in analyzing the plant status so as to make recommendations to the Emergency Coordinator concerning mitigating actions

to reduce damage to plant equipment, to prevent release of radioactive materials, and to terminate the emergency condition.

No violations or deviations were identified.

10. Protective Responses (82301)

This area was observed to verify that guidelines for protective actions during the emergency, consistent with Federal guidance, were developed and in place, and protective actions for emergency workers, including evacuating 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 developed and implemented emergency procedures for formulating protective action recommendations (PARs) for offsite population within the 10 mile EPZ. The licensee's PARs were consistent with the Environmental Protection Agency (EPA) and other criteria.

The inspector observed that site accountability was completed within the 30 minute goal. The alarm and Public Address announcements were audible in the TSC and OSC.

No violations or deviations were identified.

11. 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 organization 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.F, and specific criteria in NUREG-0654, Section II.N.

The licensee conducted a series of post-exercise critiques on February 20 and February 21, 1991. Critiques were held with players, controllers, and management. The management critique was attended by exercise controllers, observers, and NRC representatives. Findings identified during the exercise and plans for corrective action were discussed. Licensee action on identified findings will be reviewed during subsequent inspections.

The licensee's critique was detailed, and addressed both substantive deficiencies and planned improvement items. The conduct of the critique was consistent with the regulatory requirements and guidelines cited above.

No violations or deviations were identified.

12. Action on Previous Inspector Findings (92701)

There were no previous Inspector Findings to review or close.

13. Exit Interview

The inspection scope and results were summarized on February 21, 1991, with those persons indicated in Paragraph 1. The inspector described the areas inspected and discussed in detail the inspection results listed below. Proprietary information is not contained in this report. Requests for additional details surrounding the non-cited violation and exercise weakness were answered following closure of the formal exit and on February 22, 1991. The licensee committed to conduct training and run two remedial exercises to demonstrate their medical response.

<u>Item Number</u>	<u>Description and Reference</u>
50-413, 414/91-06-01	NCV - Failure to control and maintain current revisions of Implementing Procedure in the OSC supply cabinet (Paragraph 8(c)).
50-413, 414/91-06-02	Exercise Weakness - Failure to classify, make timely notification to State/local organizations, demonstrate adequate Health Physics Practices and First Aid Response techniques during the medical drill (Paragraphs 5, 2(e)).

Attachments:

1. Exercise Timeline
2. Exercise Scope and Objectives

CONFIDENTIAL

CATAWBA EXERCISE EVENT SEQUENCE

FEBRUARY 20, 1991

Time
Initial
Conditions
at 0800
Meeting

- * Unit 1 is at 100% power and 290 effective full power days (EFPD) and a continuous run of 86 days in fuel cycle 5.
- * Unit 1B diesel generator (D/G) inoperable, tagged for various preventive maintenance (PM) work. Required operable by 02/21/91 at 0400.
- * Unit 1B decay heat removal system (ND) inoperable, tagged for mechanical seal replacement. ND pump is expected to be returned to service by 1300. Required operable by 02/21/91 at 0400.
- * Unit 1C steam generator (S/G) power operated relief valve (PORV) is tagged and isolated to repair a seat leak. PORV is disassembled.
- * Unit 1B VC/YC is inoperable, tagged for compressor repairs on chiller. Awaiting parts for completion - should be available within 3-4 days. Required operable by 02/25/91 at 0400.
- * Unit 2 is at 46% power and decreasing load per shutdown procedure for refueling outage.

0900

- * Normal full power operations on unit 1.

0915

- * Steam Generator (S/G) 1C tube leak develops (100gpm).

Predicted Response

- o Operators will implement procedure AP10 (Reactor Coolant Leak, Case I).
- o Operators may request S/G samples.

0915-0930

- o 1EMF28 (S/G C steamline) Trip 2.
- o 1EMF31 (Turbine Building Sump) Trip 2.
- o 1EMF33 (Condensate Steam Air Ejectors-CSAE) Trip 2.

0925

- o Begin load decrease to take unit 1 off-line. (Contingency message will be issued, if needed, to make operators reduce load at 10-15% per hour).
- o Operations should diagnose >50 gpm primary leak.

0940

- o Implement RP/O/A/5500/01 (Classification of Emergency) by this time.
- o Implement RP/O/A/5500/03 (Alert) by this time due to primary coolant leakage >50 gpm.

I. SCOPE AND OBJECTIVES

A. Scope

The 1991 Catawba Nuclear Station annual exercise is designed to meet the exercise requirements of 10CFR50, Appendix E, Section IV.F. The exercise will be conducted on February 20, 1991.

This exercise will involve participation of Catawba Nuclear Station emergency response personnel. The State and Counties will receive communications only. The Crisis Management Center will not participate.

The medical drill will be held in conjunction with the annual exercise, involving transportation of a contaminated, injured patient to the hospital. The fire drill will not be conducted during annual exercise week.

A formal critique including Duke Power and NRC will be held on February 21, 1991 at 10:00 a.m. at Catawba Nuclear Station. This critique will be closed to the public.

B. Exercise Objectives (Duke Power Company Emergency Organization)

Emergency Management

1. Demonstrate the ability to declare emergency classifications 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 proper use of the message format and authentication methodology for messages transmitted to the state and the counties.
4. Demonstrate the ability to alert, notify, and staff the TSC and OSC facilities after declaring an Alert or higher emergency class.
5. Demonstrate precise and clear transfer of responsibility from the Shift Supervisor in the Control Room to the Emergency Coordinator in the TSC.
6. Demonstrate the ability to notify NRC not later than 1 hour after declaring one of the emergency classes.

7. Demonstrate assembly of station personnel within 30 minutes in a simulated emergency and provide accountability for any not present at the assembly locations.
8. Test communications equipment among on-site emergency facilities including plant extensions and intercoms.
9. Test primary off-site communications equipment to the county and state warning points and to NRC including the Selective Signaling System and the NRC Emergency Notification System.
10. Test the adequacy and operability of emergency equipment/supplies.

Accident Assessment

11. Demonstrate the ability to access data using the Data Transmittal System.
12. Evaluate the adequacy of the following assessment tools, as applicable:
 1. Drawings
 2. Data Display Boards
 3. Maps
13. Demonstrate the ability to continuously monitor and control emergency worker exposure.
14. Demonstrate the ability to determine on-site radiation levels and airborne radionuclide concentrations.
15. Demonstrate the ability to develop off-site dose projections in accordance with procedures.
16. Demonstrate the ability to locate a simulated, radioactive plume and to measure the off-site radiation levels.
17. Demonstrate adequate radio communications between the off-site monitoring teams and the TSC.
18. Demonstrate the ability to collect air, soil, water and vegetation samples in accordance with procedures.

Plant Operations

19. Demonstrate the ability to assess the incident and provide mitigation strategies.

Medical Drill

20. Demonstrate proper response to a simulated medical emergency involving a contaminated patient in accordance with station procedures.

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1030

- * S/G 1C tube leak increases to 400gpm.
- * VC/YC train A trips.
- * On Reactor Trip, C steamline Code Safety (1SV8) opens and will not close.
- * On safety injection (SI), 1A ND pump fails to start due to a relay problem.
- * Pressurizer level decreases.

Predicted Response

- o Operators perform a manual reactor trip/safety injection per procedure AP10 and go to procedure EP01 (as follows):
- o Operators implement the following emergency procedures:
 - EP/1/A/5000/01 (Reactor Trip/Safety Injection)
 - EP/1/A/5000/1D (Steamline Break Outside Containment)
 - EP/1/A/5000/1E (Steam Generator Tube Rupture)
 - EP/1/A/5000/1E3 (Steam Generator Tube Rupture with Continuous NC System Leakage - Subcooled Recovery)
- o Control room dispatches Non-Licensed Operator (NLO) to 1A ND pump and its feeder breaker at 1ETA to investigate failure to start.
- o Control room dispatches NLO to A VC/YC to investigate failure to start.

1035

- * Operators in control room hear steam blowing in the interior doghouse.

Predicted Response

- o Control room dispatches NLOs to interior doghouse to investigate. (One of the NLOs will be a medical emergency victim. Refer to separate medical drill scenario for details.)

1045

- * NC pump 1C impeller breaks causing fuel damage.
- * NC pump 1C Hi and HiHi vibration alarms.
- * NC pump 1C trips.
- * Vibration and Loose Parts Monitor annunciator.

Predicted Response

- o Control room requests primary samples from Chemistry.
- o Implement RP/0/A/5500/04 (Site Area Emergency) by this time due to >50 gpm NC system leak and unisolable break on a ruptured S/G. (A General Emergency may be declared based on NC system activity and loss of barriers.)

Approx.
1100

* If NM valves are opened for Chemistry sample:

Predicted Response

- o Flow to 1EMF48 (Reactor Coolant Monitor) will be reinitiated and 1EMF48 will alarm in Trip 2 (>1000 times background).
- o NM lab area monitor (1EMF2) will alarm.

1105

* 1CA60 (Auxilliary feedwater to S/G 1A) has a ruptured air line and fails full open.

Predicted Response

- o Control room dispatches NLO to 1CA60.
- o After NLO inspection of 1CA60, Instrument and Electrical (IAE) should be contacted to repair the air line.

1115

* If A VC/YC chiller has not been fixed and restarted:

Predicted Response

- o Control Room temperature will exceed 85°F.
- o Operators will take action to reduce Control Room temperature by attempting to repair the VC/YC chiller.

1200

* NC system cooldown and resultant steam pressure decrease will cause 1SV8 (C steamline code safety) to reset.
* Plant cooldown and depressurization continues.

Predicted Response

- o Operations should attempt to place 1B ND in service.

1300

Exercise ends.

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