SEP 1 5 1989

Duke Power Company ATTN: Mr. H. B. Tucker, Vice President Nuclear Production Department 422 South Church Street Charlotte, NC 28242

Gentlemen:

2

14

SUBJECT: FEMA FINAL REPORT ON THE CATAWBA EXERCISE OF FEBRUARY 19-20, 1988

Enclosed is a copy of the report by the Federal Emergency Management Agency (FEMA) on the Catawba Nuclear Station emergency response exercise conducted on February 19-20, 1988. As indicated in the report, FEMA identified one deficiency, involving the medical services activity. A remedial drill, conducted on June 17, 1988, corrected the deficiency. Also, 11 areas requiring corrective actions were identified by FEMA during the exercise, as well as an additional 45 areas recommended for improvement.

We encourage you to assist the appropriate organizations in resolving the weaknesses identified by FEMA. Resolution of these items should be completed prior to the next full-scale emergency preparedness exercise.

We also encourage you to work closely with the State and counties in the development of a scenario for the next full-scale exercise that will effectively test the areas in which the referenced items were identified.

Your cooperation in this matter is appreciated.

Sincerely, Original Signed by W. Rankin for Douglas M. Collins, Chief Emergency Preparedness and Radiological Protection Branch Division of Radiation Safety and Safeguards official

Enclosure: FEMA Final Report

cc w/encl: T. B. Owen, Station Manager Catawba Nuclear Station P. O. Box 256 Clover, SC 29710

cc w/o encl: (See page 2)

8909270085 890915 PDR ADOCK 05000413 PDC PDC Duke Power Company

cc w/o encl:

3.

R. L. Gill Nuclear Production Department Duke Power Company P. U. Box 33189 Charlotte, NC 28241

A. V. Carr, Esq. Duke Power Company 422 South Church Street Charlotte, NC 28242

J. Michael McGarry, III, Esq. Bishop, Liberman, Cook, Purcell and Reynolds 1400 L Street, NW Washington, D. C. 20005

North Carolina MPA-1 3100 Smoketree Ct., Suite 600 P. O. Box 29513 Raleigh, NC 27626-0513

Heyward G. Shealy, Chief Bureau of Radiological Health South Carolina Department of Health and Environmental Control 2600 Bull Street Columbia, SC 29201

Richard P. Wilson, Esq. Assistant Attorney General S. C. Attorney General's Office P. O. Box 11549 Columbia, SC 29211

Michael Hirsch Federal Emergency Management Agency 500 C Street, SW, Room 840 Washington, D. C. 20472

North Carolina Electric Membership Corporation 3400 Summer Boulevard P. U. Box 27306 Raleigh, NC 27611

cc w/o encl: (Continued on Page 3)

Duke Power Company

1.

Karen E. Long Assistant Attorney General N. C. Department of Justice P. O. Box 629 Raleigh, NC 27602

Saluda River Electric Cooperative, Inc. P. O. Box 929 Laurens, SC 29360

S. S. Kilborn, Area Manager Mid-South Area ESSD Projects Westinghouse Electric Corporation MNC West Tower - Bay 239 P. O. Box 335 Pittsburg, PA 15230

County Manager of York County York County Courthouse York, SC 29745

Piedmont Municipal Power Agency 100 Memorial Drive Greer, SC 29651

State of South Carolina

bcc w/encl: K. N. Jabbour, NRR Document Control Desk

NRC Resident Inspector U.S. Nuclear Regulatory Commission Route 2, Box 179-N York, SC 29745





Federal Emergency Management Agency

Washington, D.C. 20472

Mr. Frank J. Conyel Director Division of Radiation Protection and Emergency Preparedness Uffice of Nuclear Reactor Regulation U. S. Nuclear Regulatory Commission Washington, D.C. 20555

Dear Mr. Conyel:

Enclosed is a copy of the final exercise report for the February 19-20, 1988, full participation joint exercise of the offsite radiological emergency preparedness plans site-specific to the Catawba Nuclear Station. The Catawba Nuclear Station is located approximately six miles north of Rock Hill in northern York County, South Carolina. The State of South CaFolina, and York County, and the State of North Carolina, and Gaston and Mecklenbury Counties, which are located in the 10-mile plume emergency planning zone (EPZ), participated in the exercise.

The exercise report was prepared by Region IV staff of the Federal Emergency Management Agency (FEMA) and includes the comments resulting from the Regional Assistance Committee review. There was one deficiency identified during this exercise involving the medical services activity. A remedial drill was satisfacturily conducted on June 17, 1988, which corrected the deficiency. The report identifies eleven additional areas requiring corrective action.

Based on the results of this exercise and the remedial drill, the offsite radiological emergency plans and preparedness for the State of South Carolina, and York County, and the State of North Carolina, and Gaston and Mecklenburg Counties, remain adequate to protect the health and safety of the public in the event of a radiological emergency at the Catawba Nuclear Station. Therefore, the 44 CFR 350 approvals granted on October 8, 1985, for both North Carolina and South Carolina will remain in effect.

FEMA Region IV will furnish a copy of this final exercise report to the States of South Carolina and North Carolina. The Region will assure completion by the States of the necessary corrective actions.

If you should have any questions, please contact Mr. Craig S. Wingo, Chief, Technological Hazards Division, at 646-3026.

Jenn Bunsterende Cannis Kwiatkowski

Assistant Associate Director Office of Natural and Technological Hazards Programs

Enclosure

FEDERAL EMERGENCY MANAGEMENT AGENCY REGION IV



EXERCISE

CATAWBA NUCLEAR STATION

1

•



2

Federal Emergency Management Agency

Region IV 1371 Peachtree Street, NE, Suite 760 Atlanta, GA 30309

CATAWBA NUCLEAR STATION

EXERCISE

Conducted on February 19-20, 1988

Exercise Report April 8, 1988

Utility: Duke Power Company Plant Location: Near Clover, South Carolina

Participating State and Local Governments:

State of South Carolina State of North Carolina York County, South Carolina Chester County, South Carolina Gaston County, North Carolina Mecklenburg County, North Carolina Cleveland County, North Carolina Union County, North Carolina



...

TABLE OF CONTENTS

1

.

		ray
I.	EXERCISE SUMMARY	1
II.	DETAILED DISCUSSION	2
	State of South Carolina	2
	State Emergency Operations Center (SEOC)	2
	Forward Emergency Operations Center (FEOC)	3
	Dose Assessment	4
	Emergency Operations Facility (EOF)	5
	Media Center	5
	Mobile Radiological Laboratory	6
	Field Monitoring Teams	3
	York County	12
	Chester County (Host)	16
	State of North Carolina	18
	Area "E" Office	18
	Gaston County	19
	Mecklenburg County	21
	(Including Remedial Medical Drill)	23
	Cleveland County (Host)	24
	Union County	26
III.	SURMARY LISTING OF INADEQUACIES	29
IV.	SUMMARY LISTING OF AREAS RECOMMENDED FOR IMPROVEMENT	32
v.	APPENDICES	37
	A. Evaluator List and Assignments	
	B. Exercise Objectives and Scenario	

Page

I. EXERCISE SUMMARY

The Catawba Nuclear Station full participation exercise was conducted on February 19-20, 1988, and was observed and evaluated by twenty Federal evaluators representing five Federal agencies. The evaluation was based on NUREG-0654-FEMA-REP-1, Rev. 1, "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans in Support of Nuclear Power Plants".

The Catawba Nuclear Station is owned and operated by the Duke Power Company. It is located approximately six miles north of Rock Hill in northern York County, South Carolina. A large portion of York County and smaller areas of Mecklenburg and Gaston Counties in North Carolina lie within the plume exposure pathway.

The exercise included the following major participants:

South Carolina

2

1.4

• .

Emergency Preparedness Division Department of Health and Environmental Control, Bureau of Radiological Health York County Chester County

North Carolina

Division of Emergency Management Mecklenburg County Gaston County Cleveland County Union County

Objectives of the exercise were accomplished with only one NUREG-0654 deficiency identified. There were also eleven areas requiring corrective actions identified and several areas recommended for improvement. These requirements and recommendations are listed in Sections III and IV of this report.

II. DETAILED DISCUSSION

State of South Carolina

State Emergency Operations Center (SEOC)

The State EOC is located in the basement of the Rutledge Building. The facility had adequate displays and equipment, including back-up power, to support emergency operations. The EOC can support extended operations if necessary.

The initial notification of the Emergency Preparedness Division (EPD) was delayed because of a problem with the Highway Patrol Dispatcher. The Alert was declared at 6:10 p.m. and EPD received notification at 6:40 p.m. However, the Department of Health and Environmental Control (DHEC) was notified at 6:22 p.m. and, according to procedures, called EPD to verify its receipt of notification. The Director of EPD was thereby notified and ordered activation of the SEOC. At 6:55 p.m. the State contacted York County to inform them of the Alert and obtain their status.

At 7:00 p.m. a representative from DHEC arrived and set up operations. DHEC deployed field teams to Catawba, since there had been a radioactive release.

The SEOC was effectively managed by the Operations Officer. He conducted briefings to keep the staff informed and gave separate briefings to the executive group. Twenty-ning people, representing eight State agencies, were in the EOC. The staff were knowledgeable of their duties and carried them out well.

The EPD Director consulted with appropriate staff in making decisions. The early decision to deploy the FEOC was made primarily to avoid freezing road conditions later on that night. SLED and DHEC personnel were already in the area.

DHEC did not recommend deployment since plant conditions appeared stable and the release was declining. The FEOC was deployed at 9:00 p.m.

Deficiencies: None.

Areas Requiring Corrective Actions: None.

Areas Recommended for Improvement:

 Provide additional training in notification procedures to Righway Patrol dispatchers.

Forward Emergency Operations Center (FEOC)

.?

. *

The South Carolina Forward Emergency Operations Center (FEOC), located in the National Guard Armory in Clover, South Carolina, is an excellent facility and meets all requirements for a Forward EOC. There were 72 individuals representing 13 South Carolina State agencies, four representatives from two North Carolina State agencies, and six representatives from other organizations, totaling 88 participants at the FEOC. Emergency management operations in the FEOC were under the leadership of the Director, South Carolina Emergency Preparedness Division. All activities were closely coordinated with North Carolina representatives and their county officials. Changes in emergency classification received from Duke Power Company were effectively coordinated between the South Carolina Governor's Office, EPD Director, Senior Radiological Health officials and the Senior North Carolina representative.

Agreed upon EBS coordination procedures were not followed at the FEOC. EBS messages were not transmitted to Mecklenburg County for concurrence and coordination. This failure to properly coordinate EBS messages resulted in an inadequate demonstration of public instructions being broadcast for some North Carolina residents. (E.6.)

Sirens were sounded and the message was broadcast within the FEMA 15-minute requirement, with the exception of the simulated activation of sirens in Gaston County which is discussed later in this report.

All communication systems functioned properly. Sufficient briefings were given to keep participants informed.

Deficiencies: None.

Areas Requiring Corrective Actions:

 E.6. - Transmit all EBS messages to Mecklenburg County for concurrence and coordination. Also, the current written EBS procedural agreement should be reviewed in light of the experience of the past two Catawba exercises and the acquisition of additional communications equipment. (Corrected - SOP and verification letter on file in FEMA Region IV office.)

Areas Recommended for Improvement:

1. The Operations Officer should verify that sirens were sounded in each county. This would preclude the situation that happened in Gaston County where the communicator took the information from the S.C. Operations Officer but failed to inform the County Coordinator to activate the A&N System. 3. In view of North Carolina's requirement for receiving EBS messages at the county level for concurrence and coordination, it is suggested that the senior North Carolina representative at the FEOC be designated this entire coordination responsibility.

Dose Assessment

South Carolina DHEC/BRH demonstrated the ability to perform dose projections and recommend protective actions for plume pathway hazards. The radiological assessment was based on information from the utility and off-site monitoring. Determination of protective actions was efficient and professional. Computer programs were employed throughout the exercise to project population and emergency worker exposures based on data from the utility and field monitoring teams. The principal consideration in making protective action decisions were whole body and thyroid projected doses.

Use of emergency planning guides and overlays developed prior to the accident were utilized. Following the LOCA and containment failure, the dose assessment was based on the utility source release information and area meteorology to yield dose calculation of plume exposure and to trigger protective actions. The protective actions were based on the risk of plume exposure and contaminated drinking water.

The protective actions for sheltering and evacuation were based on current PAG recommendations and models for the expected duration of release. The exposure covered by the PAGs is that received by the airborne plume plus exposure from material deposited from the plume during the plume exposure phase of the accident. The protective action recommendations were made after consideration of plant status information, weather conditions and field monitoring data.

Early in the exercise, there were 15-minute delays in the Selective Signal Line. From 10:35 a.m. until 12:10 p.m., plant information was not given to the dose assessment team adequately. This is vital information for protective action recommendations.

All eighteen objectives for dose assessment and protective actions were achieved.

Superior Items:

 FEOC radio communications to and from field monitoring teams were excellent and allowed updated plotting of data at the FEOC. A simulated call was initiated to Federal officials for monitoring team back-up and dose assessment assistance.

Deficiencies: None.

Areas Requiring Corrective Actions: None.

Areas Recommended for Improvement:

 When excessive delays are incurred regarding dose assessment, team leader should endeavor to obtain this information.

Emergency Operations Facility (EOF)

The State of North Carolina dispatched one person from the Emergency Management Agency to the Crisis Management Center. Similarly, the State of South Carolina deployed one representative from the Department of Health and Environmental Control. These representatives effectively interacted and coordinated directly with the Duke Power Recovery Manager and other staff members. Although the State representatives served in a liaison capacity, as opposed to a decision-making role, their actions assisted greatly in mitigating the consequences of the simulated accident. Overall, communications and coordination were excellent.

Deficiencies: None. Areas Requiring Corrective Actions: None. Areas Recommended for Improvement: None.

Media Center

The Media Center was fully staffed during the Alert phase of the exercise. Responding to established mobilization procedures using up-to-date call lists, representatives reported from Duke Power Company, the States of North and South Carolina, and York, Mecklenburg, Gaston, and Union Counties. Twenty-four hour staffing was demonstrated by rosters. An exceptionally high level of professionalism was displayed by news center personnel, who were enthusiastically assisted by clerical and support staff.

The Media Center is in a modern, secure facility which has adequate space and equipment to support the news center mission. Especially efficient office equipment, appropriate maps, displays and public information material were available. The news media briefing area was set up to accommodate approximately 150 reporters, though this figure could be doubled. Adequate telephones and space for reporters were provided. The facility also has excellent communications. Particular noteworthy is a dedicated nows center facsimile transmission system linking the news center to State EOCs and the EPZ counties. The establishment of this system implemented a corrective action required from the previous exercise.

Excellent media kits with appropriate materials were available for news media personnel in the briefing area, as well as copies of news releases. Three news media briefings were held following thorough preparatory meetings by the staff members making presentations. All briefings were accurate, interesting, and supported by maps and visuals.

Rumor control was effectively carried out by a team of eight responders from the two States and Duke Power Company. The rumor control telephone number was publicized in press briefings and public information issuances. Handling as many as eight calls at a time, the well-prepared rumor control staff did an excellent job answering a large number of questions.

The overall successful operation of the news center was the result of an excellent facility and the professionalism of the news and support staff, whose coordinated efforts produced quality news releases.

Deficiencies: None. Areas Requiring Corrective Actions: None.

Areas Recommended for Improvement: None.

Mobile Radiological Laboratory

. *

The State activated a mobile radiological monitoring laboratory from the South Carolina Department of Health and Environmental Control, Bureau of Radiological Health in Columbia. The mobile laboratory was prepositioned at the Clover National Guard Armory for this exercise.

The laboratory team leader demonstrated superior technical expertise. The mobile unit had appropriate equipment for analyzing all types of field samples and the capability for determining radioiodine concentration at levels below 10⁻⁷ uCi/cc in the presence of noble gases.

An area of concern was the handling of two air samples with reported radiation readings of 1150 mR/hr and 9000 mR/hr. These were erroneous numbers which were accidentally provided by the controller. However, those high readings were never questioned by the field team, mobile laboratory or dose assessment staff. The field team transferred these samples to a member of the mobile laboratory without a briefing.

No surface radiation survey of the filters was performed by the mobile laboratory. The use of a GM meter for the screening of the sample bags for contamination was inadequate due to possible interference from the air filters. These samples nevertheless were taken directly inside the mobile laboratory for processing. This should not have happened. Also, a soil sample was later logged in, placed on the ground outside the laboratory and was never counted.

The ability of the mobile laboratory to handle a large number of samples is questionable. There was a heavy dependence on the laboratory team leader to provide production and direction. During an emergency, the leader would be inundated with work. Also, procedures need to be written or improved in the following areas: equipment and supplies inventory and maintenance, sample control point, sample screening and preparation, sample storage, contamination control, and the assignment of priorities for sample analysis. (N.2.e.)

No functional survey meters were available at the mobile laboratory from the time of activation until after the first sample had arrived. The control line was established after the arrival of the initial sample. The placement of ropes for control were done in a manner that did not restrict flow.

Deficiencies: None.

Areas Requiring Corrective Actions:

1. N.2.e. - Radiological laboratory's lack of procedures and organization. Develop and/or revise procedures to improve sample screening, contamination control, equipment inventory, sample preparation for analysis, and equipment maintenance. Develop an area for use as a control point which can be used to effectively screen and store samples, and evaluate, decontaminate and assign priorities for sample analysis.

Areas Recommended for Improvement: None.

Field Monitoring Teams

Field Team Yeager and Johnson - The field monitoring team was prepositioned at the FEOC, in Clover, S.C. The team was provided initial briefings concerning plant conditions and status.

The equipment on hand matched the equipment list, and all instruments had been recently calibrated. Respirators were not available for the team members. The vehicle was not a 4-wheel drive vehicle, although the scenario had indicated that a heavy snow had covered the area.

In general, the team members were adequately trained in using the gamma survey meters and air samplers at fixed locations and did an excellent job. The team had no difficulty in locating the monitoring points, and took open and closed window readings at 6 inches and 4 feet at locations as directed. Dosimeter readings were taken frequently and reported to the dispatcher. Two air samples and one soil sample were taken as requested by the dispatcher. Under the conditions of the exercise, a snow sample, in lieu of a soil sample, should have been requested by the dispatcher. Some additional training in taking gamma measurements while traversing the plume would be beneficial.

The maps provided the team were sufficient, and the team members were very familiar with the area. Radio communications were excellent, enabling contact with the dispatcher throughout the exercise. No back-up radio was on hand, although the team indicated a "walkie-talkie" was available at the FEOC. Overall, communication protocol was good. Early in the exercise, messages were not identified as drill or exercise messages.

The team had KI in their kits and were familiar with the procedures for its use as well as the maximum dose allowed without authorization.

Because the map provided the controller was very poor, he had to ask the team member to indicate his location on the map. According to the controller, the radiological data provided the controller was not adequate to provide readings from the air and soil samples.

Deficiencies: None.

Areas Requiring Corrective Actions: None.

Areas Recommended for Improvement:

- Provide additional training in traversing the plume.
- 2. Provide respirators for the team members.
- Provide four-wheel drive vehicles to improve operational capability.
- 4. Improve communication protocol,
- Provide controllers better maps and radiological input for the exercise.

Field Team 5 - Radio communications between monitoring Team 5 and the Forward Emergency Operations Center were excellent. The controller notified the team of the General Emergency and the siren started to sound before the message recorder completed recording the message at 10:16.

Because the monitor was familiar with the area and the team's map was good, monitoring points were easily located.

The team was prepositioned and deployed from the FEOC located at the National Guard Armory in Clover. Before deployment, team members were individually briefed on plant conditions and wind and snow conditions. They were instructed to check equipment with the checklists taped on the lids of the equipment containers.

According to the participants there is a system in place for emergency call-up consisting of beepers for the ten people in the South Carolina Bureau of Radiological Health. Also, there is a call list used by the Radiological Health duty officer. A proposal is being considered to receive activation calls direct from the South Carolina Highway Patrol.

The GM counter is in need of repair and no back-up was available. The team does not have a scintillation counter for field use, but depends on taking samples to the laboratory. (H.10.)

The team could not demonstrate a procedure for measuring radioiodine levels in the air because there were no instructions for making the calculations using the pancake probe. Soil and vegetation samples were not taken. The team depends on taking air filters to the laboratory for measurement. (I.9.)

The team members had neither a mid-range 0-20R personal dosimeter or a high-range 0-200R dosimeter. (K.3.a.) There were a number of indications that radiological instruments had been left behind in Columbia. Apparently, the instruments used were borrowed; the monitors were unfamiliar with them.

Superior Items:

1

.

- 1. Radio communications.
- 2. New air sampler and a generator (120 volts).

Deficiencies: None.

Areas Requiring Corrective Actions:

- H.10. Radiation measuring instruments should be operationally checked in Columbia before leaving for the field.
- I.9. Provide instruction sheets and training in measuring radioiodine levels in the air using the pancake probe.
- K.3.a. Provide each monitoring team member a midrange 0-20R dosimeter and a TLD.

Areas Recommended for Improvement:

- 1. Provide respirators for monitors.
- 2. Provide a back-up such as the CDV-700.

Field Team 326/321 - The team was prepositioned at the Forward EOC, in Clover, S.C. Briefings on plant conditions were given before departure and were subsequently updated during the exercise. The equipment list is part of the Plan and a list was in the equipment container. The vehicle was a station wagon suitable for all terrain and large enough to comfortably transport team personnel and equipment. Portable radiation survey instruments and an air sampling device were part of the team equipment. The air sampling device operated on a 120V generator carried on the vehicle. Though not used, the team had sufficient soil, liquid and vegetation paraghernalia. Equipment calibration appeared up-to-date; one instrument had a calibration date of February 20, 1988. Equipment was checked for correct operation prior to departure. Use of radioactive survey instruments at 6 inches and 48 inches was appropriate. The driver for the field team was a State employee with DHEC based in Lancaster County and was familiar with the area. The air sample was taken and handled according to procedures. This sample was calculated to be over 1R, using information from the controller. There was no concern expressed about this sample by field team members or the dispatcher at the mobile laboratory.

When the team returned to the mobile laboratory about two hours later, there was no discussion concerning this sample prior to transferring it from the field team personnel to the mobile laboratory personnel. (N.2.e.)

Prior to arriving at the location where additional portable radioactive survey instruments were dispersed, it was determined the vehicle's radio was not functional. At the pick-up point a vehicle with a properly operating radio was provided to the team for the remainder of the exercise. The radio operator was lax in opening and closing transmissions with "This Is A Drill". The team had sufficient and protective clothing but were not equipped with respirators. The field team and driver had personnel dosimetry devices and were familiar with dose criteria.

Deficiencies: None.

. *

Areas Requiring Corrective Actions:

 N.2.e. - Plans and procedures should be changed to direct a significant response to an "elevated" sample.

Areas Recommended for Improvement:

- 1. Provide respirators.
- Provide better maps to controller and adequate data input to field teams.
- Improve radio protocol and include "This Is A Drill" in all messages.
- Provide additional training concerning plume traversing.

York County

Emergency Operations Center (EOC) - The EOC was activated with no inordinate delays or other problems. All appropriate county agencies and voluntary organizations were represented. An elaborate, redundant (tone alert radios, "beepers", and telephone) staff notification system was utilized to good effect. Staffing shift capabilities were demonstrated by presenting lists and by deploying staff to an alternate facility while maintaining operations at the primary EOC.

Operations were expertly directed by the County Emergency Preparedness Director. Routine staff briefings were conducted and procedural packets were provided to each agency represented in the EOC. Despite these efforts, some staff indicated that they were confused and ill-informed. This was partially explained by the fact that several positions were filled by alternate instead of primary designees. Data requirements were generally well met with the exception that information on mobility-impaired individuals was incomplete and not well organized. (J.10.d.)

EOC facilities were adequate with the following exceptions: 1) The main status board, depicting deployment and evacuation information, was not legible from more than 15 feet; 2) There was no centrally-located, large-scale operations map.

The communications capability was adequate and no major equipment problems were experienced. Message center procedures, however, were not well defined or utilized.

Superior Items:

1. The County Emergency Preparedness Director and the entire EOC staff displayed an enthusiastic and cooperative spirit that well-served the citizens of York County. A real concern for people's safety was evident throughout the exercise.

Deficiencies: None.

Areas Requiring Corrective Actions:

 J.10.d. - Information on the mobility-impaired should be further developed and kept current. Substantial work was done to improve the data during the exercise; however, more remains to be done.

Areas Recommended for Improvement:

*

- Staff activation would be enhanced by a more structured orientation process during the opening phases.
- Agency representatives should be required to brief the County Emergency Preparedness Director relative to response readiness of assets under their control.
- Status boards and maps should be enlarged to enhance legibility from any point in the EOC.
- Request that a Duke Power Company technical representative be present in the EOC during the entire exercise.

<u>Decontamination</u> - The decontamination activity at the Bethesda Volunteer Fire Department was adequate. The physical plan for the site was good and prefabricated equipment for personnel decontamination was functional. Monitoring procedures were good and procedures to control contamination were adequate.

Areas of recommended improvements such as pre-operation equipment checks, undressing procedures for workers, and modifications of items for equipment and vehicle washing were discussed. Monitoring of key points on vehicles was demonstrated.

Superior Items:

 Department participation was excellent, especially since an actual response to a vehicle accident had just been completed.

Deficiencies: None.

Areas Requiring Corrective Actions: None.

Areas Recommended for Improvement:

- Pre-operation check-out procedures for monitoring equipment, including dosimeters.
- Exit procedures for personnel working in a "contaminated" area after decontaminating equipment and vehicles.

<u>School Evacuation</u> - The notification and evacuation of the Mt. Gallant Elementary School was well planned and conducted. Notification came from the county EOC via tone alert radio to the District 3 office. The school also monitors the tone alert radio, so the notification is to all parties at the same time. The district office followed up the tone alert with a telephone call to the school principal and the school system transportation officer.

Upon the evaluator's arrival at the elementary school, the students were in line, orderly, and preparing to board the first buses, which had arrived a few moments earlier. The school's P.A. system was used to notify all students, staff and faculty of the drill. Students were loaded by class, several classes to a bus. Each class was accompanied by a teacher.

Ten buses were met in the parking area, then ordered and directed to the loading area.

All aspects of the exercise were well ordered and well controlled. The school's staff, faculty and students did an excellent job.

Superior Items:

.

 The planning and commitment of the school system to participate in a complete exercise.

Deficiencies: None.

Areas Requiring Corrective Actions: None.

Areas Recommended for Improvement: None.

Traffic Control Points - York County activated and staffed three of four traffic control points (TCP's). Sheriff's deputies established the three TCP's after receiving notification from the Emergency Operations Center. Each deputy was knowledgeable of evacuation routes; however, additional training on procedures, location of shelters and dosimetry equipment would enhance the overall effectiveness of TCP's in York County. (0.4.d.)

Deficiencies: None.

Areas Requiring Corrective Actions:

 0.4.d. - Provide radiological training for traffic control point personnel.

Areas Recommended for Improvement: None.

Route Alerting - The entire EPZ of York County is adequately covered by sirens. Route alerting is utilized as a back-up system.

At 9:57 a.m., eight rescue squad members were dispatched by a call from the EOC to their pre-assigned route alerting areas to verify that the warning sirens were operating. Within a short period all sirens had been checked, and those sirens that did not work were reported by returning rescue squad members.

The route alerting began at 10:40 a.m. and ended at 11:05 a.m. The staff had route maps. Some staff members exercised the PA system and some did not. There was a prescripted message that was given to those members performing route alerting. The message did not contain information directed to the public concerning tuning-in to the EBS stations for further instructions.

Some problems were experienced by the rescue squad captain in receiving a prompt and clear message from the EOC regarding the time route alerting was to begin. This unnecessarily delayed the deployment of rescue squad members. There were problems experienced by all squad members receiving communications on their beepers.

Generally, the route alerting system functioned properly, but there are some areas that should be improved.

Superior Items:

.

- The leadership and conscientiousness of the rescue squad leader.
- 2. Cooperation and enthusiasm of rescue squad members.

Deficiencies: None.

Areas Requiring Corrective Actions: None.

Areas Recommended for Improvement:

- Communications equipment should be checked and the system tested periodically to assure prompt and clear communication.
- EOC should prepare and send a route alerting message that is clear and gives specific instructions to the public.
- Rescue squad members should practice stopping every fourth of a mile while sending a message over the PA system.

- 4. Rescue squad leadership must give clear instructions to route alerting personnel on whether the sirens are actually to be sounded or simulated and the PA system used or simulated during an exercise.
- 5. Route alerting procedures should be refined and developed in more detail.

Chester County (Host)

<u>Relocation Center/Shelter</u> - The Lewisville High School relocation center in Chester County was well organized and adequately staffed to handle the expected influx of personnel. A nurse and sociologist were available. Arrangements were evident for the handicapped and elderly. The physical facilities were adequate.

Sufficient staff was on hand for one shift, and a roster for a three-shift operation was available. Organization and conduct of the exercise by the center was very good.

The planning basis for contaminated personnel arriving at the center should be examined. The current policy of evacuation prior to release would make vehicle and personnel monitoring much easier and probably change the traffic flow and monitoring decisions.

Superior Items:

 The staff was very knowledgeable and the facility well organized.

Deficiencies: None.

Areas Requiring Corrective Actions: None.

Areas Recommended for Improvement: None.

<u>Decontamination</u> - The personnel decontamination activity at the Lewisville High School in Chester County was adequate. The monitors were knowledgeable and followed proper monitoring procedures. Equipment was calibrated, and the flow of personnel was controlled sufficiently to preclude possible spread of contamination.

Inadequate marking and security around the decontamination station was discussed with the staff. Establishing a second facility to provide separate (male and female) decontamination stations was discussed. This would entail training additional monitors. A revision of the planning related to the practice of evacuation prior to a release was discussed. This would change the exterior traffic flow and the monitoring procedures significantly.

The vehicle decontamination station was well organized. The personnel monitored the exterior of a bus and washed it down. Follow-up monitoring was adequate. All procedures were followed and the waste water run-off was directed to an area where dilution or surface removal would be used.

Deficiencies: None.

.

Areas Requiring Corrective Actions: None.

Areas Recommended for Improvement:

- Separation of decontamination facilities for male and female (not just alternating).
- 2. Security and marking of controlled area.

State of North Carolina

Area "E" Office (Lincolnton)

.

.....

The Area "E" Office was activated at 6:40 p.m. by the Emergency Management Coordinator following receipt of the notification of Alert status. Staffing was completed at 7:14 p.m. The fourperson staff was well trained and knowledgeable of their tasks.

The Emergency Management Coordinator was effectively in charge. The emergency plans for both Duke Power and all North Carolina EOC's were available. Messages were logged and handling was efficient.

The Area "E" Office had adequate lighting, telephones, and furniture; however, it was somewhat cramped. The status boards and maps were posted and were of very high quality.

The Office was well equipped with communication systems. The facsimile system worked well, as did all the telephones. However, the Selective Signaling System from the utility is merely an extension of Lincoln County's. It does not ring at the office and therefore, is manually monitored. A separate line would enhance the overall operation.

The staff coordinates the passing of information for public alerting and use of State resources for protective actions but has no decision-making role.

Superior Items:

 Maps and status boards were superior. The staff was quite knowledgeable and very well trained.

Deficiencies: None.

Areas Requiring Corrective Actions: None.

Areas Recommended for Improvement:

- Install a Selective Signaling line at the Area "E" Office.
- 2. The Area "E" Office staff could assist in coordinating the activation of the Alert and Notification System by assuring that Gaston and Mecklenburg County Coordinators have received the appropriate information. This assurance should be accomplished on an independent communications system, i.e., radio or commercial telephone and not on the Selective Signaling System.

Gaston County

Emergency Operations Center (EOC) - The EOC was activated and staffed according to procedures. Agency representatives present were dedicated and knowledgeable of their assigned duties. The physical layout of the EOC was excellent. Security, displays, furnishings and back-up power makes this facility more than adequate for continuous emergency operations. The Director displayed outstanding leadership. The EOC staff was limited due to the County Commissioners and agency heads attending a countywide conference. The Director also conducted an appropriate number of briefings and consulted with other EOC staff members.

The message flow from Central Communications to the Director was generally adequate. However, at 10:05 a.m., the dispatcher received a call from the FEOC stating that the sirens were to be sounded at 10:15 a.m. Due to subsequent receipt of warning messages, the Director was not notified of this telephone call until 10:20 a.m., the time of the EBS broadcast. The Director then simulated the activation of the sirens. (E.6.)

Superior Items:

- 1. Excellent emergency management leadership.
- 2. Excellent facilities.

Deficiencies: None.

Areas Requiring Corrective Actions:

1. E.6. - Follow established written procedures regarding alert and notification system activation. (Corrected through meetings and the development of a revised and clarified SOP, on file in FEMA Region IV office.)

Areas Recommended for Improvement: None.

Relocation Center - (York Chester Jr. High School) - This center has been moved from Ashley Jr. High School. It now has space for 3,308 people. The gymnasium area has been remodeled and is an excellent facility for a relocation center.

Evacuees are monitored as they enter the facility and are processed according to procedures. However, unnecessary monitoring of evacuees from sectors that are not in the plume slows the entire sheltering process.

This new facility is excellent. The relocation center provides a large entrance-way, shower, sleeping and eating facilities.

Deficiencies: None.

14

Areas Requiring Corrective Actions: None.

Areas Recommended for Improvement:

1. Monitor only when necessary.

<u>Decontamination</u> - The South Gaston Fire Department set up the facility in front of the fire department building. Vehicles entered the parking lot through markers showing drivers where to go. Both vehicles and personnel could be monitored and decontaminated. The fire department had a shower available for personnel decontamination. However, only a limited number of people could be sent through the facility.

The State DOT was available to construct a dam nearby for run-off water from vehicle decontamination.

The firemen seemed to be competent in most aspects of their job; however, they do need a refresher course in radiation monitoring.

Deficiencies: None.

Areas Requiring Corrective Actions: None.

Areas Recommended for Improvement:

 Provide firemen additional training in radiation monitoring.

<u>Traffic Control Points</u> - The traffic control points were manned by Sheriff's deputies. The officers followed a standard operating procedures manual. Deputies were supplied with CDV 138's for personnel monitoring and had a supply on hand for those persons going into the 10-mile EPZ. The officers were not well versed in the use of the CDV 138's.

Deficiencies: None.

Areas Requiring Corrective Actions: None.

Areas Recommended for Improvement:

 Provide additional training for traffic control point personnel in radiation dosimetry.

Mecklenburg County

......

<u>Emergency Operations Center (EOC)</u> - Due to limited participation, the Mecklenburg County EOC demonstrated only minimal staffing during the exercise. This staffing was prompt and adequate to meet all activities defined by the scenario. However, the callup list in the county police dispatch center was not current. (E.2.)

The Emergency Management Director effectively managed the EOC emergency operations, especially during Day 2 when the county and Charlotte managers were absent.

The facilities at the Mecklenburg County EOC were adequate; however, if the facility were fully staffed, conditions could become crowded and noisy. All communications systems functioned properly throughout the exercise. Status boards were posted, but not maintained with all current information. All necessary map data (e.g., relocation centers, traffic control points, evacuation routes, etc.) were not posted or available in the Operations Room. Access control to the EOC was excellent. An officer checked everyone's ID with a list of approved participants and issued visitor's badges.

Only one prescripted EBS message was coordinated with South Carolina and released in a timely manner after the sirens were activated. When the utility declared a General Emergency, the EOC waited for instructions from the South Carolina FEOC to issue the EBS message. The EOC Director, who was also responsible for notifying and coordinating with the other North Carolina counties, stated emphatically that all EBS messages must first come from the South Carolina FEOC for the concurrence of affected North Carolina counties. However, the EOC never received word from the South Carolina FEOC, and the only public instructions transmitted were those issued by South Carolina. (E.6.)

Superior Items:

1. EOC management and security.

Deficiencies: None.

Areas Requiring Corrective Actions:

- 1. E.2. Update the EOC call list.
- E.6. Develop clear procedures for this interstate coordination and conduct meetings to insure that both States fully understand those procedures. (Corrected -Procedures and verification letter on file in FEMA Region IV office.)

Areas Recommended for Improvement:

- 1. The warning message sheets should be properly completed by staff in the county police dispatch center with the name of the person receiving the utility message, date, and time the message was received.
- 2. Reduce the noise level in the EOC.
- 3. All necessary maps and status boards should be posted in the EOC and kept current.

<u>Medical Services</u> - The setting of the accident in a radiation laboratory area was very realistic. Sealed sources provided background radiation for instruments to detect when properly used by the first responders (fire department). Make-up on the victim and Coleman lentern mantels provided source readings for detection, monitoring and decontamination of the patient.

The Mecklenburg County EMS personnel depend on the fire department for radiation detection. Since the fire department was slow in using the instrument, the radiation hazard in the grea went unnoticed for some time. Several people were standing about in a contaminated area. Since only one instrument was being used, the monitoring of several victims was delayed. During the transfer of the most seriously injured patient from one EMS team to another EMS team, information on the location and intensity of the contamination was lost. Consequently, upon arrival at the hospital, there was no transfer of information to the hospital staff other than "suspected contamination".

Upon arrival at the Charlotte Memorial Hospital, it was evident that the preparations of the area were hurred. Floor coverings were not secured in the treatment room. As people moved around, several nurses tripped on the coverings. The waste container was outside the treatment room, necessitating movement out of the room to dispose of swabs, sponges and other material used in the decontamination attempt. Supplies were outside a closed double door, requiring a nurse to move from the treatment room to the double door to get supplies. On at least one occasion, the treatment-room nurse opened the door.

There was no one in the treatment area trained to use a monitoring instrument; therefore, victims were not monitored properly. Decontamination was inadequate because the method used would have allowed contaminated water to pool on the rubber mat under the patient. Moving the patient from one mat to another would have required a number of successive moves without proper monitoring. No attempt was made to collect samples from the patient. Considering the type of accident, samples of body fluids, nasal wipes and tissue from the wound should have been collected. This was not considered until the evaluator asked if samples would be taken.

None of the staff had participated in undressing procedures appropriate to exiting a contaminated area. They were aware of the process but did not know the procedure. The evaluator talked them through a procedure; however, a monitor was not present to survey personnel in the urea.

Superior Items:

.

 Scenario preparation for the "accident" was outstanding.

Deficiencie2:

 L.1. - Training; commitment by hospital to fully participate. Conduct a remedial exercise.

Areas Requiring Corrective Actions: None.

Areas Recommended for Improvement: None.

Medical Services - Remedial Drill - June 17, 1988 - A remedial medical drill was conducted on June 17, 1988, to re-examine the capability of the Charlotte Memorial Hospital to properly handle an injured-contaminated individual.

The medical drill was initiated by a call from an Emergency Medical Service (EMS) vehicle to the hospital stating that there was a vehicle accident with an injury and possible radiation contamination. Communication was maintained with the vehicle. Patient condition and contamination questions were appropriate.

Work commenced immediately on preparing the receiving area and treatment room. Security was in place and re-routed traffic as necessary. Contamination control procedures were adequate.

Patient transfer was swift and the information exchange between EMS personnel and hospital staff complete. The areas of contamination were promptly monitored and contamination was reconfirmed.

Decontamination procedures were adequate. Monitoring of the wound site was frequent. Use and disposal of 4x4's and other decontaminating items was proper. Sample of wound material, temporary dressings, etc. was proper and controlled. Samples

were identified and tagged for subsequent laboratory analysis. Upon completion of the procedures, the patient was transferred to the clean area. The treatment team went through a complete undressing procedure.

The remedial drill was successful in demonstrating the hospital's ability to deal with an injured patient who has radioactive contamination.

Superior Items:

8.86

 The hospital staff was fully prepared and exhibited good team work and desire to successfully demonstrate their abilities.

Deficiencies: None.

Areas Requiring Corrective Actions: None.

Areas Recommended for Improvement:

- Insure the treatment team contamination control by frequently exchanging outer gloves during decontamination.
- Re-examine undressing procedures and ensure consistent training for the treatment team and the monitors.

Cleveland County (Host)

Emergency Operations Center (EOC) - Cleveland County, a bost county, activated and sufficiently staffed the EOC in a timely manner. Emergency management personnel, the County Department of Social Services, American Red Cross and local law enforcement personnel were present.

The EOC is an excellent facility with adequate communications. It is located in the law enforcement complex building and was managed by a very capable Emergency Management Director.

Maps indicating access control points and relocation centers were available but not all were posted in the EOC.

An actual news release was prepared and coordinated; however, the press briefing was simulated since there were no media present. A rumor control number was published.

Superior Items:

1. EOC facilities.

2. Enthusiasm of EOC participants.

Deficiencies: None.

Areas Requiring Corrective Actions: None.

Areas Recommended for Improvement:

 Display all access control points and relocation centers on EOC maps.

<u>Relocation Center</u> - King's Mountain High School was activated promptly and staffed with a sufficient number of personnel from several agencies. Staff is available to operate on a 24-hour basis.

Some staff members were used as evacuees during demonstrations of monitoring, decontamination, and registration procedures. An SOP has been developed and was used for decontamination and proper disposal of contaminated clothing and other materials. The clothing was placed in plastic bags inside separate containers. After evacuees were checked for contamination, the noncontaminated evacuees were sent directly to the registration desk for processing. Those found to be contaminated were sent to separate showers over plastic-covered walkways. After showering and decontamination, they were issued clothing and directed to the registration desk.

The school is an excellent shelter. The Red Cross advised that the facility could hold over 3,600 evacuees. This facility will be surveyed by the State EM Division in May to determine its exact capacity.

The Department of Social Services and American Red Cross personnel worked very well together. Supplies such as medical items, cots, blankets, registration forms and comfort kits were on hand or readily available. All shelter personnel demonstrated adequate training and were very enthusiastic about their jobs.

Superior Items:

 Enthusiasm and knowledge displayed by all personnel at the relocation center.

Deficiencies: None.

Areas Requiring Corrective Actions: None.

Areas Recommended for Improvement: None.

Traffic Control Points - One traffic control point at the intersection of Bethelehem and Phifer Roads was observed in Cleveland County. A member of the Cleveland County Sheriff's Department staffed the traffic control point. The Deputy was aware of his responsibilities, the evacuation routes and the location of the shelters. He had a personal dosimeter (0-200mR) and record keeping card but did not fully understand the significance of the readings or what he would do if his dosimeter indicated a reading.

Deficiencies: None.

Areas Requiring Corrective Actions: None.

Areas Recommended for Improvement:

1. Provide additional training for traffic control point personnel.

Union County

...

Emergency Operations Center (EOC) - The Union County EOC is located in the Union County Courthouse. It is adequate to support emergency operations. Union County is a host county for sheltering evacuees of Mecklenburg County. The county has a full-time staff consisting of the Coordinator and a Chief Planner.

The exercise was well managed by the emergency management staff. Frequent briefings were held and actions were discussed with appropriate staff members. Access to the EOC was controlled by the City of Monroe's Public Safety Department. The County Chairman and two other commissioners were involved in the decision-making process.

The communications system is superior and includes the 911 system, Amateur Radio, facsimile machines, and a computer. This system is operational 24-hours a day.

Union County's EOC was activated promptly, using a current call list. Upon receipt of the Alert, the Coordinator had seven staff members activated. Other agencies were put on stand-by and were activated as the emergency escalated. Union County was notified of the Alert at 6:50 p.m. by the N.C. Area "E" Office. Union County EM staff began to arrive at 6:55 p.m. and, by 7:10 p.m., the EOC was minimally staffed for the Alert. Adequate briefings were conducted by the Operations Officer.

On Day 2 of the exercise, the Union County EOC was fully staffed.

Union County demonstrated that it is capable of managing emergencies, including the hosting/sheltering of evacuees from Mecklenburg County. The County has an excellent emergency management team and elected official support.

Superior Items:

1. Interest shown by county elected officials.

- 2. Attitude, interest, cooperation shown by EOC staff.
- 3. Communications capability.

Deficiencies: None.

Areas Requiring Corrective Actions: None.

Areas Recommended for Improvement:

- 1. Use of phonetic alphabet, when referring to sectors.
- Record date of County Plan review to insure the plan is updated annually.

Relocation Center - Union County's Sun Valley High School was used in the exercise to demonstrate sheltering capability.

There was excellent supervision and control by the Shelter Manager. The shelter was expeditiously staffed by members of the American Red Cross, Department of Social Services, and EMS. A Public Health Nurse was present and participated.

The staff did an excellent job of registering and processing evacuees. Seven vehicles of volunteers participated as evacuees. Upon arrival, the evacuees were monitored individually by EMS. However, monitoring probes were not covered. Once monitored, they were directed to the shelter, which had a capability for decontamination. The floor which the contaminated individuals were to walk upon was not covered. Superior Items:

1. Effective management of Shelter Manager.

2. Participation/effectiveness of EMS and Red Cross.

Deficiencies: None.

Areas Requiring Corrective Actions: None.

Areas Recommended for Improvement:

- Walkway used by contaminated individuals should be covered by disposable material, i.e., roll paper.
- 2. Monitoring probes should be covered with plastic to protect the instruments from possible contamination.

Traffic Control Points - Three traffic control points were observed. All were staffed by the Union County Sheriff's Department deputies who were knowledgeable of procedures and demonstrated professionalism.

Seven vehicles were directed to Stallings Volunteer Fire Department for vehicle monitoring. The vehicle monitoring was excellent. The monitors were well trained and handled the task in a timely fashion. However, monitoring probes were not covered with plastic. The personnel interviewed were aware of their duties and responsibilities.

Superior Items:

- Motivation and initiative demonstrated by Sheriff's Department.
- Implementation of traffic control and monitoring procedures.

Deficiencies: None.

Areas Requiring Corrective Actions: None.

Areas Recommended for Improvement:

 Monitoring probes should be covered with plastic to prevent possible contamination.

III. SUMMARY LISTING OF INADEQUACIES

Facility or	NUREG	Corrective	Scheduled
Activity	Item	Action	Date of
			Completion

Deficiencies

North Carolina

*

.

.

Mecklenburg County	L.1.	Training; commitment by hospital to fully	June	17,	1988
		participate. Conduct a remedial exercise.			

Areas Requiring Corrective Actions

South Carolina

FEOC	E.6.	Transmit all EBS messages to Mecklenburg County for concurrence and coordina- tion. Also, the current written EBS procedural agreement should be reviewed in light of the experience of the past two Catawba exercises and the acquisition of additional communications equipment.	June	2,	1989
Mobile Radiological Laboratory	N.2.e.	Radiological laboratory's lack of procedures and organization. Develop and/or revise procedures to improve sample screen- ing, contamination control, equipment inventory, sample preparation for analysis, and equipment maintenance. Develop an area for use as a control point which can be used to effectively screen and store samples, and evaluate, decontaminate and assign priorities for sample analysis.			

Facility orNUREGCorrectiveScheduledActivityItemActionDate of

*

.

.

Completion

Areas Requiring Corrective Actions (Con't.)

South Carolina (Con't.)

Field Monitoring Teams	H.10.	Radiation measuring instruments should be operationally checked in Columbia before leaving for the field.
	I.9.	Provide instruction sheets and training in measuring radioiodine levels in the air using the pancake probe.
	K.3.a.	Provide each monitoring team member a mid-range 0-20R dosimeter and a TLD.
	N.2.e.	Plans and procedures should be changed to direct a significant response to an "elevated" sample.
York County	J.10.d.	Information on the mobility-impaired should be further developed and kept current. Substantial work was done to improve the data during the exercise; however, more remains to be done.
	0.4.d.	Provide radiological training for traffic control point personnel.

Facility or	NUREG	Corrective
Activity	Item	Action

Scheduled Date of Completion

Areas Requiring Corrective Actions (Con't.)

North Carolina

. .

1 10 A

Gaston County	E.6.	Follow established written procedures regarding alect and notification system activation.	June	2,	1989
Mecklenburg	E.2.	Update the EOC call list.			
councy	E.6.	Develop clear procedures for this interstate coordination and conduct meetings to insure that both States fully under- stand those procedures.	June	2,	1989

IV. SUMMARY LISTING OF AREAS RECOMMENDED FOR IMPROVEMENT

Activity	Area	as Recommended for Improvement
South Carolina		
SEOC	1.	Provide additional training in notification procedures to Highway Patrol dispatchers.
FEOC	1.	The Operations Officer should verify that sirens were sounded in each county. This would preclude the situation that happened in Gaston County where the communicator took the information from the S.C. Operations Officer but failed to inform the County Coordinacor to activate the A&N System.
	2.	In view of North Carolina's requirement for receiving EBS messages at the county level for concurrence and coordination, it is suggested that the senior North Carolina representative at the FEOC be designated this entire coordination responsibility.
Dose Assessment	1.	When excessive delays are incurred regarding dose assessment, team leader should endeavor to obtain this information.
Field Monitoring	1.	Provide additional training in traversing the plume.
and Johnson	2.	Provide respirators for the team members.
	3.	Provide four-wheel drive vehicles to improve operational capability.
	4.	Improve communication protocol.
	5.	Provide controllers better maps and radiological input for the exercise.

*

. .

•

*

5

.

Facility orActivityAreas Recommended for Improvement

South Carolina (Con't.)

Field	1.	Provide respirators for monitors.
Team 5	2.	Provide a back-up such as the CDV-700.
Field	1.	Provide respirators.
Team 326/321	2.	Provide better maps to controller and adequate data input to field teams.
	3.	Improve radio protocol and include "This Is A Drill" in all messages.
	4.	Provide additional training concerning plume traversing.
York County	1.	Staff activation would be enhanced by a more structured orientation process during the opening phases.
	2.	Agency representatives should be required to brief the County Emergency Preparedness Director relative to response readiness of assets under their control.
	3.	Status boards and maps should be enlarged to enhance legibility from any point in the EOC.
	4.	Request that a Duke Power Company technical representative be present in the EOC during the entire exercise.
	5.	Pre-operation check-out procedures for monitoring equipment, including dosimeters.
	6.	Exit procedures for personnel working in a "contaminated" area after decontaminating equipment and vehicles.
	7.	Communications equipment should be checked and the system tested periodically to assure prompt and clear communication.

Facility or Activity

Areas Recommended for Improvement

South Carolina (Con't.)

York County	8.	EOC shoul	d prepare as	nd se	end a	route	
(Con't.)		alerting	message that	t is	clear	and gives	-
		specific	instruction	s to	the p	ublic.	

- Rescue squad members should practice stopping every fourth of a mile while sending a message over the PA system.
- Rescue squad leadership must give clear instructions to route alerting personnel on whether the sirens are actually to be sounded or simulated and the PA system used or simulated during an exercise.
- Route alerting procedures should be refined and developed in more detail.
- Chester County 1. Separation of decontamination facilities for male and female (not just alternating).
 - 2. Security and marking of controlled area.

North Carolina

- Area "E" Office 1. Install a Selective Signaling line at the Area "E" Office.
 - 2. The Area "E" Office staff could assist in coordinating the activation of the Alert and Notification System by assuring that Gaston and Mecklenburg County Coordinators have received the appropriate information. This assurance should be accomplished on an independent communications system, i.e., radio or commercial telephone and not on the Selective Signaling System.
- Gaston County 1. Monitor only when necessary.
 - Provide firemen additional training in radiation monitoring.

Facility or Activity

Areas Recommended for Improvement

North Carolina (Con't.)

Gaston County 3. Provide additional training for traffic (Con't.) Control point personnel in radiation dosimetry.

- Mecklenburg 1. The warning message sheets should be County properly completed by staff in the county police dispatch center with the name of the person receiving the utility message, date, and time the message was received.
 - 2. Reduce the noise level in the EOC.
 - All necessary maps and status boards should be posted in the EOC and kept current.
 - Medical Services 4. Insure the treatment team contamination Remedial Drill control by frequently exchanging outer gloves during decontamination.
 - Re-examine undressing procedures and ensure consistent training for the treatment team and the monitors.
- Cleveland 1. Display all access control points and County relocation centers on EOC maps.
 - Provide additional training for traffic control point personnel.
- Union County 1. Use of phonetic alphabet, when referring to sectors.
 - Record date of County Plan review to insure the plan is updated annually.
 - Walkway used by contaminated individuals should be covered by disposable material, i.e., roll paper.

Facility or Activity

•

.

11 N

Areas Recommended for Improvement

North Carolina (Con't.)

Union County (Con't.)

- Monitoring probes should be covered with plastic to protect the instruments from possible contamination.
- 5. Monitoring probes should be covered with plastic to prevent possible contamination.

V. APPENDICES

- A. Evaluator List and Assignments
- B. Exercise Objectives and Scenario

1

.

.

FEDERAL EVALUATOR ASSIGNMENTS CATAWBA NUCLEAR POWER STATION EXFRCISE February 19-20, 1988

> CHIEF OF EVALUATORS John Heard (FEMA)

S.C. STATE EOC (COLUMBIA) Larry Robertson (FEMA) *

S.C. FORWARD EOC (CLOVER) John Heard (FEMA) Chuck Wakamo (EPA)

EMERGENCY OPERATIONS FACILITY (CHARLOTTE) Bob Trojanowski (NRC)

> MEDIA CENTER (CHARLOTTE) Tom Hawkins (FEMA) Ed Hakala (FEMA)

<u>S.C. RADIOLOGICAL LABORATORY (CLOVER)</u> Peter Chin (DOE)

> RADIOLOGICAL FIELD TEAMS George Goforth (FEMA) Bill Knoerzer (FEMA) Ed Sears (FEMA)

N.C. AREA "E" OFFICE (LINCOLNTON) Sam Nelson (FEMA)

MEDICAL ACTIVITIES Brad Eichorst (DHHS/FDA) **

YORK COUNTY, S.C. (ROCK HILL) Don Hammonds (FEMA) Robert Perdue (FEMA)

GASTON COUNTY, N.C. (GASTONIA) Frank Wilson (FEMA) Tim Dowd (FEMA) Bill McSwain (FEMA)

MECKLENBURG COUNTY, N.C. (CHARLOTTE) Marty Simonin (FEMA)

CLEVELAND COUNTY, N.C. (SHELBY) Al Lookabaugh (FEMA)

UNION COUNTY, N.C. (MONROE) Josh Moore (FEMA)

* - Will Relocate to FEOC on Saturday Morning

** - Will Also Evaluate The School Evacuation in York County

The State of South Carolina Military Department



OFFICE OF THE ADJUTANT GENERAL

January 5, 1988

T. ESTON MARCHANT MAJOR GENERAL THE ADJUTANT GENERAL

> Mr. Glenn C. Woodard, Chief Natural and Technological Hazards Division FEMA, Region IV 1371 Peachtree Street, NE Atlanta, Georgia 30309

Dear Mr. Woodard:

In accordance with Section N, NUREG-0654, the purpose/scope, exercise objectives, and scenario for the Catawba Nuclear Station full participation exercise to be conducted 19 and 20 February 1987 are attached.

Sincerely,

Vam ere mond L.

Raymond L. Bro Director

RLB:RGC:cme

Attachments

I. PURPOSE AND SCOPE

On February 19 and 20, 1988, a full participation emergency preparedness exercise will be conducted at the Catawba Nuclear Station to test the integrated capabilities of FEMA, NRC, States of North and South Carolina, the affected counties and the basic elements of the emergency preparedness plans. The test will require the mobilization and the deployment of state and local response forces to verify their capabilities to respond to an actual emergency at the Catawba Plant.

The exercise will determine the state and local's ability to work efficiently with the utility and the State of North Carolina under emergency conditions. Qualified evaluators will determine the strengths and weaknesses of the emergency response forces, and the deficiencies will form the basis for corrective actions.

This will be a night, no-notice exercise. Only key personnel have been notified of the exact time and date. The exercise will begin after 1800 hours on Friday, 19 February, and continue through the Alert Phase. At this time there will be a break until 0900 on Saturday, 20 February. The exercise will then continue in real time.

Simulated winter storm aftermath conditions will prevail in the exercise area before and during the exercise.

II. OBJECTIVES

4 8

- A. The State of South Carolina Will:
 - Demonstrate ability to mobilize and activate facilities promptly.
 - Demonstrate ability to make decisions and to coordinate emergency activities.
 - Demonstrate adequacy of facilities and displays to support emergency operations.
 - Demonstrate ability to communicate with all appropriate locations, organizations and field personnel.
 - Demonstrate ability to project field data and to determine appropriate protective measures, based on PAG's, available shelter, evacuation time estimates and all other appropriate factors.
 - Demonstrate ability to implement protective actions for plume pathway hazards.
 - Demonstrate ability to alert the public within the 10-mile EPZ and disseminate an initial instructional message within 15 minutes.
 - Demonstrate ability to formulate and distribute appropriate instructions to the public in a timely fashion.
 - 9. Demonstrate the organizational ability and resources necessary to deal with impediments to evacuation, including weather or traffic obstructions.
 - Demonstrate ability to continuously monitor and control emergency worker exposure.
 - Demonstrate ability to brief the media in a clear, accurate and timely manner.
 - Demonstrate ability to provide advance coordination of information released.
 - Demonstrate ability to make the decision, based on predetermined criteria, to supply and administer KI to emergency workers.

- Demonstrate ability to supply and administer KI, once the decision has been made to do so.
- 15. Demonstrate ability to establish and operate rumor control in a coordinated fashion.
- 16. Demonstrate ability to fully staff facilities and maintain staffing around the clock.
- Demonstrate ability to mobilize and deploy field monitoring teams in a timely fashion.
- Demonstrate appropriate equipment and procedures for determining ambient radiation levels.
- 19. Demonstrate appropriate equipment and procedures for the measurement of airborne radioiodine concentrations as low as 10 uCi/cc in the presence of noble gases.
- Demonstrate appropriate lab operation functions for measuring and analyzing all types of samples.
- Demonstrate the organizational ability and resources necessary to control access to an evacuated area.
- 22. Demonstrate ability to identify need for, request, and obtain Federal assistance.
- B. York County Will:
 - Demonstrate ability to mobilize and activate facilities promptly.
 - Demonstrate ability to make decisions and to coordinate emergency activities.
 - Demonstrate adequacy of facilities and displays to support emergency operations.
 - Demonstrate ability to communicate with all appropriate locations, organizations and field personnel.
 - Demonstrate ability to implement protective actions for plume pathway hazards.
 - Demonstrate ability to alert the public within the 10-mile EPZ and disseminate an initial instructional message within 15 minutes.

- Demonstrate ability to formulate and distribute appropriate instructions to the public in a timely fashion.
- Demonstrate the organizational ability and resources necessary to deal with impediments to evacuation, including weather or traffic obstructions.
- 9. Demonstrate ability to continuously monitor and control emergency worker exposure.
- Demonstrate ability to brief the media in a clear, accurate and timely manner.
- 11. Demonstrate ability to provide advance coordination of information released.
- Demonstrate ability to supply and administer KI, once the decision has been made to do so.
- 13. Demonstrate ability to establish and operate rumor control in a coordinated fashion.
- Demonstrate ability to fully staff facilities and maintain staffing around the clock.
- Demonstrate the organizational ability and resources necessary to control access to an evacuated area.
- 16. Demonstrate the organizational ability and resources necessary to effect an orderly evacuation within the plume EPZ of these groups: transit-dependent, special needs and institutionalized.
- Demonstrate the organizational ability and resources necessary to effect an orderly evacuation of schools within the plume EPZ.
- Demonstrate adequacy of procedures for the registration and radiological monitoring of evacuees.
- Demonstrate adequacy of facilities for mass care of evacuees.
- Demonstrate adequate equipment and procedures for decontamination of emergency workers, equipment, and vehicles.
- Demonstrate adequacy of ambulance facilities and procedures for handling contaminated,

injured and exposed individuals.

. 11

.

. . .

.

- 22. Demonstrate adequacy of hospital facilities and procedures for handling contaminated, injured and exposed individuals.
- 23. Demonstrate ability to effect an orderly evacuation of onsite personnel.
- 24. Demonstrate ability to relocate to and operate the alternate EOF/EOC.

III. CATAWBA NUCLEAR PLANT FULL PARTICIPATION EXERCISE

SCENARIO BACKGROUND

On Thursday, February 18, 1988, a winter scorm crossed the upper third of South Carolina dropping eight to ten inches of snow throughout the area including Chester, Union, Cherokee and York Counties. The storm continued northeast and delivered four to six inches in the North Carolina Counties of Gaston and Mecklenburg. Winds of 30 to 45 mph created drifts of two to four feet which blocked many primary and secondary roads. Cold temperatures and ice further complicated the situation by downing many trees and power lines.

Highway maintenance and utility crews worked throughout Thursday night and all day Friday to restore roads and facilities. By 1700 hours on Friday, February 19, main roads to the Catawba are passable but restricted due to drifts and ice. Isolated power outages and road restrictions still exist.

This background and specific (simulated) road and power outage conditions will be furnished each player agency and evaluators on 19 February through normal communication channels.

CONFIDENTIAL

IV. CATAWBA NUCLEAR PLANT FULL PARTICIPATION EXERCISE 19-20 February 1988

SCENARIO NARRATIVE

At 1800 hours, 19 February, 1988, Greer National Weather Service Office issues the following forecast for the upper third of South Carolina and west central North Carolina:

"Tonight...Cloudy with a 30 percent change of light freezing rain...possibly mixed with sleet. Decreasing cloudiness after midnight. Low in the upper 20s. Northeast wind 5 to 10 mph. Saturday...Partly cloudy. Highs in the upper 40s. Northeast winds 10 mph.

At 1800 hours, Catawba Unit #1 is at 100% power. Unit #2 is in a refueling outage. Maintenance work is in progress on the upper containment, inner air lock door on Unit #1. A fuel handling accident occurs in Unit #2 Fuel Building.

An ALERT is declared. Notifications are made to warning points in North and South Carolina and the affected counties. SC Governor declares a State of Emergency and the SEOC is activated. York County EOC goes on standby and will probably be activated. Governor's Office confers with DHEC/BRH and EPD on deployment of FEOC and BRH Mobile Lab. (Both will be prepositioned to Clover Armory.)

When all ALERT actions are complete for both states, the utility, and the counties, the exercise will be suspended until the following morning. Certain out-of-sequence objective related actions may be demonstrated at this time prior to exercise suspension. A complete list of such non-scenario or out-of-sequence actions will be coordinated with controllers and evaluators prior to the exercise.

There will no no significant exercise events during the night.

At 0800 hours on 20 February 1988, NWS will issue the following forecast:

Today...Partly cloudy. Northeast wind 5 to 10 mph. High in the lower 30s.

Tonight...Partly cloudy. Lows in the upper 20s. Northeast wind 5 to 10 mph.

The exercise resumes at 0900 in real time on 20 February. The FEOC assumes direction and control.

A serious problem develops in Unit #1 which results in a lost of coclant accident (LOCA). The situation deteriorates rapidly to loss of containment integrity. A <u>GENERAL EMERGENCY</u> is declared at approximately 0950 hours. A release begins. Notifications are completed. Plant recommends evacuation of zones A0, C1, D1 and E1, and shelter for all others. Recommendations are coordinated by BRH, EPD, GEMO with county and NC state concurrence. Sirens and EBS will be activated.

Plant messages (green form) will stimulate many of the objective related activities during this period. Additional messages will be inserted by EPD controller/simulators at the SEOC, the FEOC and county EOCs.

The release will be stopped by about 1100 hours and the plant will begin recovery actions about 1330 with a time jump of 72 hours. Termination will be about 1430.

V. CRITIQUE

A closed critique will be conducted by EPD at 1300 nours on Sunday, 21 February 1988, at the Rock Hill Law Enforcement Center Courtroom.

A public critique will be conducted at a time and place to be announced.



North Carolina Department of Crime Control and Public Safety

James G. Martin, Governor Joseph W. Dean, Secretary

Division of Emergency Management 116 W. Jones St., Raleigh, N. C. 27611 (919) 733-3867

December 1, 1987

Mr. Glenn C. Woodard, Chief Natural and Technological Hazards Division Federal Emergency Management Agency Region IV 1371 Peachtree Street, NE Atlanta, Georgia 30309 Dear Mr. Woodard: Alun

A partial participation 10-mile plume exposure exercise will be conducted jointly with the State of South Carolina for Duke Power Company's Catawba Nuclear Power Station on February 19-20, 1988.

The exercise will consist of a simulated accident at the Catawba Plant which will escalate to a General Emergency and involve planned response actions.

North Carolina State Participation will consist of providing a liaison representative to South Carolina's Forward Emergency Operation Center, activation of the State Emergency Operations Center, and operation of the Area E Office for coordination of State support to the participating Counties. Mecklenburg County will not conduct any field operations during this exercise as they fully participated in the September 11, 1937 McGuire Exercise.

In accordance with FEMA Guidance Memorandum EX-3 and NUREG-0654 the objectives for North Carolina during this exercise are:

- Demonstrate ability to mobilize and activate facilities 1. promptly. (All).
- Demonstrate ability to make decisions and to coordinate 2. emergency activities. (All).
- Demonstrate adequacy of facilities and displays to 3. support emergency operations. (All).
- Demonstrate ability to communicate with appropriate 4. locations, organizations and field personnel. (All).

Glenn C. Woodard, FEMA December 1, 1987 Page Two

. . . .

.

- Demonstrate ability to evaluate data and to determine appropriate protective measures, based on PAG's, available shelter, evacuation time estimates and all other appropriate factors. (Gaston and Mecklenburg).
- Demonstrate ability to implement protective actions for plume pathway hazards. (Gaston and Mecklenburg).
- Demonstrate ability to slert the public within the 10mile EPZ and disseminate an initial instructional message within 15 minutes. (Gaston and Mecklenburg).
- 8. Demonstrate ability to formulate and distribute appropriate instructions to the public in a timely fashion. (Mecklenburg).
- 9. Demonstrate the organizational ability and resources necessary to deal with impediments to evacuation, including weather or traffic obstructions. (All).
- 10. Demonstrate ability to brief the media in a clear, accurate and timely manner. (All).
- 11. Demonstrate ability to continuously monitor and control emergency worker exposure. (All but Mecklenburg).
- Demonstrate ability in provide advance coordination of information released. (All).
- 13. Demonstrate ability to establish and operate rumor control in a coordinated fashion. (All).
- 14. Demonstrate adequacy of procedures for the registration and radiological monitoring of evacuees. (All but Mecklenburg).
- Demonstrate adequacy of facilities for mass care of evacuees. (All but Mecklenburg).
- 16. Demonstrate adequate equipment and procedures for decontamination stations. (All but Mecklenburg).
- 17. Demonstrate adequacy of ambulance facilities and procedures for handling contaminated, injured and exposed individuals. (Mecklenburg only).

Glenn C. Woodard, FEMA December 1, 1987 Page Three

> 18. Demonstrate adequacy of hospital facilities procedures for handling contaminated, injured and and exposed individuals. (Mecklenburg only).

> > Sincerely,

In

Joseph F. Myers, Director

HLR/jgm

.

14

.

.

cc: S. C. Emergency Preparedness Division Duke Power Co. (Emergency Preparedness) NC/EM (Area E)



North Carolina Department of Crime Control and Public Safety

James G. Martin, Governor Joseph W. Dean, Secretary Division of Emergency Management 116 W. Jones St., Raleigh, N. C. 27611 (919) 733-3867

December 30, 1987

Mr Glen C. Woodard, Chief Natural and Technological Hazards Division Federal Emergency Management Agency Region IV 1371 Peachtree Street, NE Atlanta, Georgia 30308 Dear Mr. Woodard:

Attached you will find the "Events Sequence" outlining North Carolina participation in the Catawba Nuclear Power Station full participation exercise to be conducted February 19-20, 1988.

Please contact Gary L Jones, at (919) 733-3867, if you have any questions concerning this portion of our planned activities.

Sincerely,

Joseph F. Myers, Director

GLJ/glj cc: S. C. Emergency Preparedness Division Duke Power Co (Emergency Preparedness) NC/EM (Area E)

CATAWBA EXERCISE EVENTS SEQUENCE FOR NORTH CAROLINA PARTICIPANTS

DATE/TIME

EVENT

February 19, 1988

1800

Unit 1 at 100% power and 80 EFPD. Unit 2 is in a refueling cutage with 350 EFPD at shutdown. Maintenance work is in progress on the upper containment inner air lock door on Unit 1.

1805

Fuel handling accident in Unit 2 Fuel building. ALERT SHOULD BE DECLARED.

Notification to off-site authorities. Minimum staffing of State EOC and Gaston and Mecklenburg County EOC3 begins. Area E Office initiates State support between the county EOCs and the State EOC. SERT PIO Element deploys to Charlotte, NC and Liaison Element deploys to the SC Forward Emergency Operations Center (SC FEOC).

2000

Suspend exercise until 0900 on February 20, 1987.

February 20, 1987

0900 Resume exercise.

SERT PIO Element inplace in Charlotte, NC and Liaison Element inplace at SC FEOC.

0915

0930

Unit 2 radiation monitors (EMFs) reading background.

Reactor coolant pump seizure on Unit 1. No scram on low flow following reactor collant pump seizure, resulting in an Anticipated Transient Without Scram (ATWS). Reactor coolant system (NC) pressure builds past the safety valves setpoint. The safety valves open, but one of them sticks open causing a Loss Of Coolant Accident (LOCA) through the safety valve. Transient yields 10% clad damage.

0932	Operators should manually scram.
0932:15	Containment isolates due to low primary system (NC) pressure. Safety injection (NI) initiates.
0935	The pressure rélief tank rupture disk blows open.
0937	Maintenance workers in containment exit through the outer upper containment air lock door. Air lock door fails to seal, resulting in loss of containment integrity.
0950 (approx)	GENERAL EMERGENCY SHOULD BE DECLARED due to loss of fission product barriors.
	Notification to off-site authorities. Recommendation to off-site authorities for evacuation and for sheltering.
1015	Mecklanburg EOC advised of traffic accident involving radiological materials and injured personnel.
1130	Release stops due to negative containment pressure.
1200	Maintenance repairs failed seal on upper containment air lock door.
1330	Time jump of 72 hours. Recovery phase begins.
1430	Exercise ends.