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JUN 1 8 1988

System Energy Resources, Inc.
ATTN: Mr. O. D. Kingsley, Jr.
Vice President, Nuclear Operations
P. O. Box 23054
Jackson, MS 39205

Gentlemen:

SUBJECT: FEMA FINAL RADIOLOGICAL EMERGENCY PREPAREDNESS EXERCISE REPORT
GRAND GULF NUCLEAR STATION EXERCISE OF NOVEMBER 17-18, 1987

Please find enclosed for your information, a copy of the FEMA Final Report for the Grand Gulf Radiological Emergency Preparedness Exercise conducted on November 17-18, 1987. Your attention is directed to the areas requiring corrective actions identified by FEMA.

We encourage you to continue to maintain the Grand Gulf Station hot-line system in an operational condition and to assist the State of Louisiana communications personnel in the training required for the effective use of the system.

We also encourage you to work closely with the State of Louisiana in the development of the scenario for the next full scale exercise to effectively test those areas in which improvement items were identified.

Your cooperation in this matter is appreciated.

Sincerely,

Douglas M. Collins, Chief
Emergency Preparedness and
Radiological Protection Branch
Division of Radiation Safety
and Safeguards

Enclosure:
FEMA Final Report

cc w/encl: (See page 2)

IE35

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FINAL
RADIOLOGICAL EMERGENCY PREPAREDNESS EXERCISE REPORT

Nuclear Power Plant: Grand Gulf Nuclear Station

Location of Plant:
Port Gibson, Mississippi

Date of Report: March 1, 1988

Date of Exercise: November 17-18, 1987

Participants: State of Louisiana
Tensas Parish, Louisiana
Ferriday Reception Center, Concordia Parish, Louisiana
Mahoney Ambulance Service, St. Joseph, Louisiana

Federal Emergency Management Agency

Region VI

Federal Regional Center
800 N. Loop 288, Denton, TX 76201

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Denton, Texas 76201

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ABBREVIATIONS

ANL	Argonne National Laboratory
DOE	Department of Energy
DOT	Department of Transportation
ENMC	Emergency News Media Center
EOC	Emergency Operations Center
EOF	Emergency Operations Facility
EPA	Environmental Protection Agency
EPZ	Emergency Planning Zone
FEMA	Federal Emergency Management Agency
FRC	Field Response Center
GGNS	Grand Gulf Nuclear Station
HHS	Health and Human Services
HP	Health Physicist
INEL	Idaho National Engineering Laboratory
KI	Potassium Iodide
LNED	Louisiana Nuclear Energy Division
LOEP	Louisiana Office of Emergency Planning
LP&L	Louisiana Power and Light Company
LPRM	Local Power Range Monitors
MP&L	Mississippi Power and Light Company
NRC	Nuclear Regulatory Commission
PAG	Protective Action Guide
RDO	Radiological Defense Officer
SAE	Site Area Emergency
USDA	United States Department of Agriculture

INTRODUCTION AND AUTHORITY

On December 7, 1979, the President directed the Federal Emergency Management Agency (FEMA) to assume the lead role responsibility for all offsite nuclear power facility planning and response.

FEMA's immediate basic responsibilities in Fixed Nuclear Facility Radiological Emergency Response Planning include:

- Taking the lead in offsite emergency response planning and in the review and evaluation of State and local government emergency plans, ensuring that the plans meet the Federal criteria set forth in NUREG-0654/FEMA REP-1, Rev. 1 (November 1980).

- Determining whether the State and local emergency response plans can be implemented on the basis of observation and evaluation of an exercise conducted by the appropriate emergency response jurisdictions.

- Coordinating the activities of volunteer organizations and other involved Federal agencies. Representatives of these agencies, listed below, serve as members of the Regional Assistance Committee (RAC), which is chaired by FEMA.

  - U.S. Nuclear Regulatory Commission (NRC)
  - U.S. Environmental Protection Agency (EPA)
  - U.S. Department of Energy (DOE)
  - U.S. Department of Health and Human Services (DHHS)
  - U.S. Department of Transportation (DOT)
  - U.S. Department of Agriculture (USDA)
  - U.S. Department of the Interior (DOI)

1 EXERCISE BACKGROUND

The Grand Gulf Nuclear Station Emergency Preparedness Exercise, Nov. 17-18, 1987, was the sixth exercise designed to test the emergency response capabilities of off-site organizations, and completed the current six-year exercise cycle. During this cycle the 39 FEMA RVI exercise objectives have been demonstrated and, with the exception of one objective, successfully met. The objective not met will be tested in the next regularly scheduled exercise. Previous exercises were held on Nov. 4, 1981; Jan. 26, 1983; April 11, 1984; Feb. 27, 1985 and Dec. 3-4, 1985. Several remedial drills designed to correct deficiencies discovered in these exercises have also been held.

The Federal Emergency Management Agency, Region VI, (FEMA RVI) evaluated the offsite emergency response capabilities of State and/or local jurisdictions during each of these exercises. The State of Louisiana and Tensas Parish fully participated in the 1987 exercise which was designed to demonstrate their emergency response capabilities during both plume and ingestion pathway periods of a nuclear incident.

The Grand Gulf Nuclear Station is located on the east bank of the Mississippi River at Port Gibson, Mississippi. Portions of the 10-mile Plume EPZ extend across the river into Tensas Parish, Louisiana, and the 50-mile ingestion pathway EPZ extends well into the state. FEMA Region VI is responsible for evaluation of off-site emergency response capabilities of State and local governments in these areas.

On November 19, two post-exercise meetings were held at the Sheraton Hotel, Natchez, Mississippi: a 7:30-11:00 a.m. meeting of the 15-member Federal Evaluation Team, to develop a preliminary exercise evaluation, and a 1:00 P.M. Federal/State/Local critique at which the preliminary results of the exercise were presented to representatives of the State and local organizations and the utility.

Section 2 of this document provides narratives and evaluations of exercise performance by participating response organizations, as well as descriptions of any Deficiencies, Areas Requiring Corrective Action and Areas Recommended for improvement noted by the exercise evaluators. Only one possible Deficiency was noted during this exercise. This Deficiency related to the inability of the State EOC or the State LNED office to initiate calls on the GGNS hot-line system. In the post-exercise period it was determined that equipment malfunctions, that have now been rectified, created this problem. Since the equipment has been repaired and certified as fully operational by the State, no remedial drill will be required.

Section 3 of this report is a tabulation of those Deficiencies or Areas Requiring Corrective Action observed during the exercise, and provides, in Table 1, a listing of corrective actions and dates of accomplishment and a FEMA evaluation of the actions.

Section 4 of this report compiles, in tabular format, all FEMA Objectives Met or Yet to be Achieved, developed from NUREG-0654/FEMA REP-1, Rev. 1, as well as a summary sheet of those objectives which have not been satisfactorily met or tested to date.

The findings presented herein have been reviewed by the RAC Chairman for FEMA Region VI. FEMA suggests that the State and local jurisdictions take remedial actions in response to each of the problems indicated in the report and that the State submit a schedule for addressing those problems. The FEMA Region VI Regional Director is responsible for certifying to the FEMA Associate Director for State and Local Programs and Support, Washington, D.C., that any Deficiencies and Areas Requiring Corrective Action have been corrected and that such corrections have been incorporated into State and local plans, as appropriate.

The following provides a brief overview of the exercise performances of the State of Louisiana and Tensas Parish governmental organizations. More detailed explanatory discussions of performance at individual exercise locations are provided under the appropriate headings in Sec. 2 of this report.

1.1 EXERCISE SUMMARY

State of Louisiana Operations

State operations for the Grand Gulf Nuclear Station exercise were directed, prior to the declaration of the Site Area Emergency (SAE), from the offices of the Louisiana Nuclear Energy Division (LNED) in Baton Rouge. Following the SAE declaration, direction shifted to the State EOC [Louisiana Office of Emergency Preparedness (LOEP) offices], also in Baton Rouge. At the State EOC, the LNED and LOEP Directors act in concert to manage State response. State agencies having designated emergency response assignments also are represented at the State EOC so that response activities may be directly coordinated among these agencies. State field monitoring team deployment and operations are directed by a Field Team Chief located at the GGNS Emergency Operations Facility (EOF) during the plume phase of the exercise and at the Tensas Parish EOC during the ingestion phase of the exercise.

The State was represented at the Emergency News Media Center at Port Gibson, Mississippi by an LNED technical liaison representative assigned to ensure coordination of all media releases and provide Louisiana representation at all media briefings.

All State agencies participating in the exercise demonstrated an adequate level of readiness for dealing with a radiological emergency. The apparent Deficiency relating to the GGNS hot-line (inability to initiate a call from LNED or LOEP offices) was, in the post-exercise period, discovered to be an equipment malfunction that has now been rectified. Individual narratives which follow in Sec. 2.1 of this report provide detailed explanations of State activities demonstrated during the exercise.

Local Government Operations

Tensas Parish is the only Louisiana Parish within the 10-mile plume EPZ for the Grand Gulf Nuclear Station, with the exception of a small, uninhabited area of Madison Parish for which Tensas Parish has agreed to provide emergency response management.

All or part of eight additional parishes are included in the 50-mile Ingestion Pathway EPZ. The eight additional parishes did not participate in this exercise as the state has primary responsibility for all ingestion pathway activities. Tensas Parish fully participated in all phases of this exercise. Concordia Parish participated to the extent of providing a reception center for simulated evacuees.

Tensas Parish demonstrated an adequate level of preparedness for dealing with a radiological emergency. Individual narratives which follow in Sec. 2.2 of this report provide detailed descriptions of activities demonstrated during the exercise.

1.2 FEDERAL EVALUATORS

Fifteen Federal evaluators participated in evaluating the Nov. 17-18, 1987 Grand Gulf Nuclear Station exercise. These individuals, their agencies and their evaluation assignments are listed below.

Evaluator	Agency	Evaluation Assignment
Gary Jones	FEMA	Tensas Parish EOC (Overall coordination of the Federal Evaluator Team)
Gary Kaszynski	ANL	LNED office and State EOC
Bob Conley	USDA	State EOC
Brad Salmonson	INEL	State Field Team #1
Frank Wilson	ANL	State Field Team #2 (Day 1) LNED Laboratory (Day 2)
Lee Peyton	FEMA	State Field Team #3
Bill Gasper	ANL	GGNS EOF (Day 1) Tensas Parish EOC (Day 2)
Harry Harrison	FEMA	GGNS EOF (Day 1)
Gary Sanborn	NRC	Media Center (Day 1) State EOC (Day 2)
Dana Cessna	FEMA	Media Center (Day 1) Tensas Parish EOC (Day 2)
Carl McCoy	FEMA	Tensas Parish EOC
Tom Goertz	FDA	Reception/Care Center (Day 1) Monitoring/Decon. (Day 2)
Al Lookabaugh	ANL	Reception/Care Center (Day 1) Monitoring/Decon. (Day 2)
Tom Carroll	ANL	Traffic Control (Day 1) Mahoney Ambulance (Day 2)
Gene Nunn	FEMA	Traffic Control (Day 1) Mahoney Ambulance (Day 2)

1.3 OFFSITE AGENCY EXERCISE OBJECTIVES

(Objectives are numbered in accord with FEMA Region VI standard list)

A. State of Louisiana (Full Participation):

1. Demonstrate ability to mobilize staff and activate facilities promptly.

2. Demonstrate ability to fully staff facilities. (NOTE: Around the clock staffing will not be demonstrated.)

3. Demonstrate ability to make decisions and to coordinate emergency activities.

4. Demonstrate adequacy of facilities, equipment, maps, and displays to support emergency operations.

5. Demonstrate ability to communicate with all appropriate locations, organizations, and field personnel.

6. Demonstrate ability to mobilize and deploy field monitoring teams in a timely fashion.

7. Demonstrate appropriate equipment and procedures for determining ambient radiation levels.

8. Demonstrate appropriate equipment and procedures or measurement of airborne radioiodine concentrations as low as 10^{-7} μCi/cc in the presence of noble gases.

9. Demonstrate appropriate equipment and procedures for collection, transport, and analysis of samples of soil, vegetation, snow, water, and milk.

10. Demonstrate ability to project dosage to the public via plume exposure, based on plant and field data, and to determine appropriate protective measures based on PAGs, available shelter, evacuation time estimates, and all other appropriate factors.

11. Demonstrate ability to project dosage to the public via ingestion pathway exposure, based on field data; and to determine appropriate protective measures based on PAGs and other relevant factors.

12. Demonstrate ability to implement protective actions for ingestion pathway hazards.

14. Demonstrate ability to formulate and distribute appropriate instructions to the public in a timely fashion.

15. Demonstrate the organizational ability and resources necessary to manage an orderly evacuation of all or part of the plume EPZ.

20. Demonstrate ability to continuously monitor and control emergency worker exposure.

21. Demonstrate ability to make the decision, based on predetermined criteria, whether to issue KI to emergency workers and/or the general population.

24. Demonstrate ability to brief the media in a clear, accurate and timely manner.

25. Demonstrate ability to provide advance coordination of information released.

26. Demonstrate ability to establish and operate rumor control in a coordinated fashion.

32. Demonstrate the ability to identify need, request, and obtain Federal assistance.

33. Demonstrate the ability to estimate total population exposure.

34. Demonstrate the ability to determine and implement appropriate measures for controlled recovery and re-entry.

35. Demonstrate the ability to effectively call upon and utilize outside support agencies when local capabilities are exceeded.

36. Demonstrate the adequacy of communication procedures and methods.

37. Demonstrate the ability to monitor emergency classification levels continuously and implement procedures in a timely manner.

38. Demonstrate the capability to effectively process all incoming/outgoing messages in a timely manner, including the documenting of both actual and simulated messages.

B. Tensas Parish (Full Participation):

1. Demonstrate ability to mobilize staff and activate facilities promptly.

2. Demonstrate ability to fully staff facilities. (NOTE: Around the clock staffing will not be demonstrated.)

3. Demonstrate ability to make decisions and to coordinate emergency activities.

4. Demonstrate adequacy of facilities, equipment, maps and displays to support emergency operations.

5. Demonstrate ability to communicate with all appropriate locations, organizations, and field personnel.

12. Demonstrate ability to implement protective actions for ingestion pathway hazards.

13. Demonstrate ability to alert the public within the 10-mile EPZ and disseminate an initial instructional message within 15 minutes.

14. Demonstrate ability to formulate and distribute appropriate instructions to the public in a timely fashion.

15. Demonstrate the organizational ability and resources necessary to manage an orderly evacuation of all or part of the plume EPZ.

20. Demonstrate ability to continuously monitor and control emergency worker exposure.

22. Demonstrate ability to distribute and administer KI, once the decision has been made to do so.

24. Demonstrate ability to brief the media in a clear, accurate and timely manner.

25. Demonstrate ability to provide advance coordination of information released.

26. Demonstrate ability to establish and operate rumor control in a coordinated fashion.

27. Demonstrate adequacy of procedures for registration and radiological monitoring of evacuees (Concordia Parish).

28. Demonstrate adequacy of facilities for mass care of evacuees (Concordia Parish).

29. Demonstrate adequate equipment and procedures for decontamination of emergency workers, equipment and vehicles.

30. Demonstrate adequacy of EMS transportation, personnel and procedures for handling contaminated individuals including proper decontamination of vehicle and equipment.

34. Demonstrate the ability to determine and implement appropriate measures for controlled recovery and reentry.

36. Demonstrate the adequacy of communication procedures and methods.

37. Demonstrate the ability to monitor emergency classification levels continuously and implement procedures in a timely manner.

38. Demonstrate capability to effectively process all incoming/outgoing messages in a timely manner, including the documenting of both actual and simulated messages.

39. Demonstrate that authority exists in coordinating and activating a reception center (as necessary) in a timely manner. NOTE: Tensas Parish has no designated reception center within the Parish; this objective will be demonstrated at Ferriday (Concordia Parish), in one of the three designated support Parish facilities.

1.4 EXERCISE SCENARIO SUMMARY

EXERCISE DAY 1

This scenario takes place in November, shortly before a scheduled shutdown for the second refueling outage. The plant is in operation at 100% power with the Division 1 Diesel/Generator inoperable to perform required inspections. In accordance with the surveillance requirements, the Division 2 Diesel/Generator was run at 0700 today. Dose equivalent iodine levels are high due to fuel leakers.

Two 7500-gallon tanker trucks containing diesel fuel arrived late last night. Fuel sampling was conducted as required to ensure the quality of the fuel before unloading. However, the trucks were unknowingly confused and one unsampled truck containing large amounts of water was unloaded into all three fuel oil storage tanks. Since the Division 2 Diesel/Generator was run after the fuel oil was added, the Division 2 Day tank now contains large amounts of water.

In addition, hydrogen loss from the main generator has been higher than normal, and maintenance personnel are attempting to determine the cause.

The first activity associated with this scenario concerns performing the required surveillance run of the Division 3 Diesel/Generator. The diesel is started at 0817; however, at 0820 a fire is observed in the generator electrical cabinets, resulting in a Diesel/Generator trip and a loss of the Division 3 DC bus IDCI. An Alert is declared due

to a fire that defeats one ESF electrical division. The fire brigade responds and extinguishes the fire.

Technical Specifications require commencement of a plant shutdown due to Division 1 and 3 Diesel/Generators inoperable; therefore, a normal plant shutdown is begun.

The three power lines connecting Grand Gulf to the remainder of the grid are lost at 1015 due to sabotage offsite. Since Division 1 and 3 Diesel/Generators are inoperable, the associated busses 15AA and 17AC lose power. The Division 2 Diesel/Generator starts, but is then lost due to the quantity of water in the fuel oil. A Site Area Emergency is declared due to a loss of offsite and onsite power for greater than 15 minutes.

The loss of power causes the reactor to scram. The only system available to supply water to the reactor is RCIC, which is manually initiated and slowly returns water level to normal.

At 1045, the chemist reviewing fuel oil truck sample results becomes aware that a mistake may have been made and that one truck may not have been sampled. This provides the OSC with some information as to the cause of the Division 2 Diesel/Generator failure. Emergency repair teams begin to work on sampling the fuel oil storage tanks and removing the water accumulation.

At 1215, the steam supply line to RCIC ruptures in the Auxiliary Building Steam Tunnel upstream of outboard isolation valve E51-F064. Since power has been lost to the isolation valves, steam flows from the reactor through the RCIC steam line to the Auxiliary Building Steam Tunnel. The steam tunnel blowout shaft ruptures, causing an unmonitored release to the environment. Unsealed penetrations in the steam tunnel walls allow contamination to spread into the Auxiliary Building. Since RCIC has been lost, reactor water level drops rapidly. A General Emergency is declared due to loss of two of the three fission product barriers (reactor vessel and containment) with the potential loss of the third (inadequate makeup to cool the core).

Efforts are begun to make the proper connections to pump fire water into the vessel, since the diesel-driven fire pumps are available.

At 1255, a member of one of the OSC teams is discovered missing. Security locates the individual on the Security Computer, and a Search and Rescue Team is organized. The individual had entered a room in the Auxiliary Building to check the status of a breaker and the door would not allow him to exit. He is located and returned to the OSC uninjured.

At 1350, the Division 2 Diesel/Generator is restored to service and bus 16AB re-energized. RHR B and C inject into the vessel and fuel damage ceases. Valves E51-F063 and F076 close, terminating the release. Also, Standby Gas Treatment System B initiates causing fission products remaining in the Auxiliary Building to be treated before release. At 1410, one 500 kV offsite power source is restored to service, allowing

restoration of drywell cooling, instrument air, and various other systems. The emergency may be downgraded by 1430 and the exercise terminated by 1500.

Exercise Day 2 (Scenario Day 4)

For the purposes of this exercise, today is assumed to be the fourth day since the initiation of the accident situation on Day 1. Events occurring since 1500 on Day 1 are as follows:

Day 1, 1500-2400 — The reactor has been placed in a cold shutdown condition with the leak isolated. Secondary Containment Integrity has been re-established with the use of a temporary but physically sound cover.

Shutdown Cooling is placed in operation. Release rates have fallen to negligible amounts.

LNED field teams continued to survey areas within 10 miles of the plant in Sectors L, M, and N (most of Sector L is in Mississippi) to determine whether radioactive materials may have been deposited as the plume passed over. Physical samples were obtained and transferred to the LNED lab in Baton Rouge for processing and analysis.

Recovery and re-entry discussions were initiated at the State EOC with various agencies. All protective actions initiated earlier in the day remain in effect.

Day 2, 0000-0800 — All offsite power has been re-established.

0800-1600 — Instigators of the power interruption have been apprehended by law enforcement officials.

Many technical (NRC, General Electric, Bechtel, etc.) and political personnel converge on GGNS to offer assistance and advice, and to begin collecting data for investigative purposes.

The Federal Radiological Emergency Response Plan (FRERP) has been activated. (No one has admitted placing the call.) FRERP Region IV has established a Federal Response Center (FRC) at the Mississippi State EOC in Jackson. FEMA Region VI has established a field facility at a Natchez hotel. The Department of Energy will establish the Federal Radiological Monitoring and Assessment Center (FRMAC) at the Vicksburg Airport. Initial DOE elements will deploy from Oak Ridge and should begin setting up later today.

1600-2400 All GGNS onsite diesel/generators are restored to operability.

Louisiana and Mississippi officials coordinated a request for radiological monitoring assistance under the provisions of the Southern Mutual Radiation Assistance Plan (SMRAP); two field teams from Arkansas arrived tonight to augment LNED forces.

Day 3 Plans are discussed for cleanup of the gaseous fission products within the vessel head, in preparation for vessel head removal.

LNED and Arkansas field teams resumed survey and sampling operations: concentrating on the areas between the Mississippi River and the 12-mile arc in Sectors L, M, and N. Preliminary results indicate no contamination detected in Sector N within 12 miles of the plant. In addition, the area in Sector M east of Highway 605 and Lake Bruin appears to be clear.

Aerial surveys performed by DOE aircraft indicate no health risks beyond 15 miles from the plant in any sector except Sectors L and M; there appear to be some localized "hot spots" in Sectors L and M in the area southwest of Lake Bruin/Highway 605 out to a distance of almost 20 miles from the plant. Apparently, scattered rain shower activity observed during the plume release on Day 1 may have caused radioactive contaminants to be deposited on the surface; Mississippi officials have experienced the same observations in Sectors K and L east of the Mississippi River.

Day 4 (Today) GGNS will continue making plans for vessel head removal.

Efforts are now concentrated on considerations for the protection of elements of the human food chain which may be contaminated from the release. Field teams from LNED and other Louisiana agencies are available for response. A DOE mobile laboratory is on station at the FRMAC in Vicksburg; Mississippi has deployed the Radiological Health Division's mobile lab closer to their area of interest.

Shortly after 0800, results are received from sampling operations performed during the preceding days' activities which indicates that no contamination was found outside Sector M. State and local officials should consider relaxing protective actions for portions of the EPZ.

After receiving an operational briefing, field teams should be dispatched to collect appropriate samples outside the plume exposure EPZ to pinpoint "hot spots" and determine levels of contamination.

At about 0900, results from sample analyses conducted at the LNED lab indicate I-131 activity in milk of 0.18 μCi/liter. This should generate appropriate preventive protective action recommendations to protect the human food chain. As additional

sample analyses are completed, I-131 activity in soil of 0.16 $\mu Ci/m^2$ and in vegetation of 0.1 $\mu Ci/kg$ are reported.

Media and public information activities should continue until exercise termination. The exercise will terminate at approximately 1200 (noon) after all necessary objectives have been demonstrated.

1.4.1 Master Sequence of Events

Time	Event
0730	Specific initial conditions given to shift personnel. Unknown to plant personnel at this time, fuel oil containing large amounts of water was added to all three fuel oil storage tanks last night.
	• Technical Specifications are consulted regarding the inoperable Diesel/Generator.
	• Preparations are made for performing the Division 3 Diesel/Generator surveillance.
0820	During the performance of the Division 3 Diesel/Generator surveillance, an electrical fault ignites a fire in the local control cabinets. The Diesel/Generator trips and the deluge system actuates; however, the fire continues to burn.
	• Operators announce the fire on the PA system and sound the fire alarm.
	• Operators start the electric fire pump and the Division 1 and 2 outside air fans.
	• Control Room actions are logged.
0823	The Division 3 battery bus is lost due to the fire.
	• Technical Specifications are consulted and preparations begun for a controlled plant shutdown.
	• Operator dispatched to de-energize bus 17AC due to a loss of DC.
	• Control Room actions are logged.
0830	Fire brigade arrives at the scene of the fire.
	• Fire Brigade Leader reports to the Control Room that the Division 3 battery bus is involved.

- Fire Brigade Leader coordinates fire-fighting efforts.
- Operators de-energize bus 17AC due to loss of DC control power.
- Control Room actions are logged.

0830 An **ALERT** is declared based on a fire defeating one ESF electrical division.

- The alert is announced over the PA system.
- Shift Superintendent instructs the operations communicator to make notifications.
- Shift Superintendent notifies the Emergency Director.
- Notification chains begin for onsite and offsite emergency response personnel.

1015 Offsite power is lost as a result of sabotage in Vicksburg and in Franklin County. A Station Blackout (SBO) results due to the inoperability of Division 1 and 3 Diesel/Generators and due to large amounts of water in the Division 2 Fuel Oil Storage Tank and Day Tank.

- MSIVs close and reactor water level drops rapidly.
- Operators manually initiate RCIC to restore reactor water level. Other actions contained in the SBO procedure (ONEP 05-102-I-6) may be taken.
- SR/Vs cycle to maintain reactor pressure.
- Operators closely observe APRMs, since SRMs and IRMs will not insert and rod position information is lost due to the SBO.
- Power is lost to the OSC (complete loss), TSC (lights and some outlets), and EOF (standby diesel operates to supply backup power). Required actions are taken to ensure critical operations are maintained.
- Drywell and containment pressures increase as the temperature rises.
- Control Room actions are logged.

1030 A SITE AREA EMERGENCY is declared, based on a loss of offsite and onsite AC power for more than 15 minutes.

- Site Area Emergency is announced over the PA system.
- Remaining emergency facilities begin activation procedures.
- The OSC forms a team to troubleshoot and repair Division 2 Diesel/Generator.

1040 Telephone inquiries begin to Parish EOC and continue at random intervals throughout the day.

1045 Chemistry personnel discover that unsampled fuel oil was added to one, or possibly all, of the fuel oil storage tanks.

- OSC coordinates tank sampling and water removal.

1215 The RCIC steam supply line ruptures inboard of the containment outboard isolation valve. Since the isolation valves are AC powered, no isolation occurs. Pressure buildup in the Steam Tunnel causes the Pressure Relief Panels to blow out, and reactor level drops rapidly due to venting the reactor to atmosphere through this break. The Auxiliary Building is also contaminated from fission products passing through unsealed penetrations in the steam tunnel walls.

- Efforts are continued to repair the Division 2 Diesel/Generator.
- A team may be formed to close containment inboard isolation valves E51-F063 and F076 electrically using a portable power supply (MCC 15B31, Area 8, 119').
- Control Room logs this occurrence.

1225 Reactor water level drops below the top of active fuel.

- An OSC team should be formed to make connections from the fire header to the reactor vessel for emergency makeup.
- Control Room actions are logged.

1235 **A GENERAL EMERGENCY** is declared due to loss of two of the three fission product barriers (RPV and containment) with the potential loss of the third (inadequate makeup to cool the core).

- General Emergency is announced over the PA system.

- Offsite radiological monitoring teams begin efforts to provide dose rates, since the release is unmonitored. Contingency source terms are used in the interim.

1245 A member of an OSC Team is trapped in a room in the Auxiliary Building.

- Security is contacted to determine the location of the individual from the Security Computer.

- A Search and Rescue Team is formed to locate the individual.

- Individual is found by the team. Since he is uninjured, medical treatment is not necessary; However, he should be checked for dose and contamination levels.

1250 Tensas Parish simulates activating alert/notification system, initiates EBS message.

1350 The Division 2 Diesel/Generator has been repaired and is placed in operation.

- RHR B and C initiate automatically and re-cover the core, preventing further core damage.

- RCIC isolation valves E51-F063 and F076 close (may close due to energization of Division 2 switchgear or due to the emergency repair team efforts.).

- Standby Gas Treatment System B initiates and, even though the Pressure Relief Panels have ruptured and a proper Secondary Containment differential pressure cannot be maintained, flow begins to enter through the ruptured area and no further unmonitored release occurs. Standby Gas Treatment release rates are small.

- Control Room actions are logged.

1401 Suppression Pool level decrease (due to ECCS operation) causes initiation of Suppression Pool Makeup.

- Suppression Pool level rises due to this actuation.

- Control Room logs this occurrence.

1400 Ferriday reception center activities (monitor and decon of evacuees)

1415 Offsite power is partially restored (500 kV only).

- Offsite power is aligned to Balance of Plant (BOP) and ESF busses.
- Drywell cooling and instrument air are returned to service, along with other BOP systems.
- Control Room actions are logged.

1430 Discussions between the TSC and EOF may result in downgrading of the emergency to a Site Area Emergency or Alert.

1500 The exercise may be terminated (offsite agencies may continue to play out events in progress).

DAY 2 (Scenario Day 4)

0800 Scenario briefing (State EOC and Tensas EOC).

0810 State EOC receives simulated analyses results; relaxation of protective actions considered for parts of EPZ.

0815 Field teams dispatched from St. Joseph.

(Telephone inquiries continue at random intervals to Parish and State EOC throughout the morning.)

0845 Contaminated injured transport (ambulance); emergency worker monitor and decon demo.

0900 More simulated analysis results received at State EOC; commence initiation of protective actions for ingestion pathways (State and Parish EOCs).

Field teams attempt to locate "hotspots" and continue sampling.

1000 More simulated analysis results to State EOC.

1200 Exercise terminated.

1.5 EVALUATION CRITERIA

The Grand Gulf Nuclear Station evaluations that follow in Section 2 of this report are based on applicable standards and evaluation criteria set forth in Section II of

NUREG-0654/FEMA REP-1, Rev. 1 (November 1980). FEMA Region VI evaluated the exercise utilizing the modular format.

Following the narrative for each jurisdiction or off-site response activity, Deficiencies, Areas Requiring Corrective Action and Areas Recommended For Improvement are presented with accompanying recommendations.

Any identified Deficiency(s) could cause a finding that offsite preparedness is not adequate to provide reasonable assurance that appropriate protective measures can and will be taken to protect the health and safety of the public, living in the vicinity of the site, in the event of a radiological emergency.

Areas Requiring Corrective Action reflect those activities where performance demonstrated during the exercise was evaluated and considered faulty. Corrective actions are considered necessary, but other factors indicate that reasonable assurance can be given that, in the event of a radiological emergency, appropriate measures can and will be taken to protect the health and safety of the public.

Areas Recommended for Improvement, as observed by the exercise evaluators, are also listed, as appropriate, for each off-site jurisdiction or exercise activity.

2 EXERCISE EVALUATION

On the basis of general criteria set forth in NUREG-0654/FEMA-REP l, Rev 1., and exercise objectives and observations, an evaluation has been made of the November 17-18, 1987 exercise at Grand Gulf Nuclear Station. This evaluation is presented herein. FEMA Region Vl will maintain close liaison With the State of Louisiana, and local governments, in determining the corrective actions (including time frames) needed to resolve each problem noted in this report in accordance with established criteria and guidelines.

2.1 LOUISIANA STATE OPERATIONS

Exercise participation by State of Louisiana organizations included operations at the Nuclear Energy Division offices and lab, the Office of Emergency Preparedness (State Emergency Operations Center), State field monitoring teams, and dose assessment at the GGNS EOF (day 1) and Tensas Parish EOC (day 2). Detailed discussions of performance at these locations are provided under specific location narratives. Successful demonstration of all but one of the stated exercise objectives indicates a satisfactory level of State emergency response capability.

The single, State level exercise Deficiency related to the inability, at both the LNED offices and the State EOC, to initiate a call on the GGNS hot-line system. This Deficiency was a carryover from the previous exercise. Following the 1985 exercise, new telepnone equipment was ordered by the utility and all parties believed that the problem had been resolved. During the period following the 1987 exercise, the current problem was determined to have been caused by an equipment malfunction that has now been located and resolved. The system has now been thoroughly tested and all communications personnel have been trained in its use. Therefore, while there was a Deficiency during the exercise, FEMA acknowledges that the problem has been resolved and no remedial drill will be required.

2.1.1 LOUISIANA NUCLEAR ENERGY DIVISION OFFICES

2.1.1.1 LNED Offices

The LNED office received the ALERT notification at 8:30 a.m. via the backup emergency response telephone since the primary dedicated hot-line did not function during the initial notification period. Later in the exercise, the problem was resolved and the hot-line did function adequately, except for the inability of the LNED office to initiate calls to other parties on the system. A fax hard-copy of the ALERT message was received at approximately 8:40 a.m.

As specified in the State plan, LNED liaison personnel, including the LNED Director, proceeded to the State EOC at the LOEP offices in downtown Baton Rouge, arriving at 9:10 a.m.. State field forces would have also mobilized and deployed at this

time. However, due to exercise time constraints, the field forces were pre-deployed to a holding point at Natchez, Mississippi. Therefore, actual activation, mobilization and deployment were not intended to be observed during this exercise. These activities have been observed during exercises at other nuclear plants in the state and have been found to be satisfactory. Activities of the LNED lab are covered in a separate narrative section.

Therefore, FEMA exercise objective #'s 1,2,3,4,6,36,37 and 38 were met. FEMA objective 5 was not met during the exercise. However, objective 5 was met during the post-exercise period when the malfunctioning equipment had been repaired.

DEFICIENCIES

87-1 Description:

The LNED office was unable to initiate (ringdown) a call on the GGNS hot-line system. This deficiency is a carry-over from the 1985 exercise. (NUREG 0654 F.1.b)

NOTE: During the post exercise period, it was discovered that the problem was caused by an equipment malfunction that has now been corrected.

Recommendation:

Since the problem has been located and corrected, FEMA acknowledges that this Deficiency has been resolved.

AREAS REQUIRING CORRECTIVE ACTION

None.

AREAS RECOMMENDED FOR IMPROVEMENT

None.

2.1.1.2 LNED Radiological Lab

Field samples obtained by state field teams were delivered to the LNED laboratory on the morning of the second day of the exercise. The samples were immediately checked for outside contamination and logged and a processing priority was established for each type of sample.

The LNED lab is very well equipped with all appropriate instruments and supplies. It participates in the EPA crosscheck program to insure the calibration of its

micro- processor controlled equipment. Should sample quantities overload this lab, assistance is available from Louisiana State University.

The lab staff is well trained and demonstrated their capability to receive and log incoming samples while maintaining good contamination control. They also demonstrated their skill in processing the samples and calculating results. Data developed by their efforts was communicated to the appropriate authorities over both telephone and fax (hard-copy) systems.

FEMA exercise objective No. 9 Was met.

DEFICIENCIES

None.

AREAS REQUIRING CORRECTIVE ACTION

None.

AREAS RECOMMENDED FOR IMPROVEMENT

None.

2.1.2 LOUISIANA STATE EOC (LOEP OFFICES)

Initial notification of the ALERT at GGNS was received in the EOC communications room at 8:30 a.m. via the hot-line system. The EOC staff immediately began the alerting process as specified in the State Plan. This alerting process was completed by 9:10 a.m. The Site Area Emergency notification was received at 10:32 a.m. and the General Emergency notification was received at 12:48 p.m. Appropriate actions were undertaken, based on the plan, following each of these key events.

Due to an actual disaster situation underway in the state at that time, many of the State Agencies who would normally staff the EOC did not respond during the plume phase of this exercise and the State Division of Human Resources representatives attended only a briefing. They advised that they could be contacted at their offices if they were needed. Agencies present in the EOC during day 1 and day 2 of the exercise were; LNED, LOEP, State Police, State Health Department and State Department of Agriculture representatives. There was an ARCA (#2) at the 1985 GGNS exercise regarding the lack of full staffing of the State EOC. Under the circumstances, as the full emergency staff did not report to the EOC for either the plume or ingestion phases of this exercise, this ARCA cannot be considered to have been resolved and will be continued until such time as full staffing has been demonstrated.

The State EOC is a large, well equipped facility, with an excellent communications section and entirely adequate space, furnishings and displays. The facility activated by setting up the operations room, the communications center and the executive group meeting/decision making room (State LOEP Director's conference room) for nuclear emergency operations. Operations during the exercise proved, once again, that the State EOC meets all requirements for effective emergency response. During the ingestion phase of the exercise (day 2), decision makers from LNED and LOEP shifted their operational base from the conference room to the operations room. The exercise players agreed that intercommunication and coordination was enhanced by this arrangement.

Executive leadership, coordination and decision making was ably demonstrated by the LNED Director and LOEP Operations Officer. Frequent briefings were held for the EOC staff and all personnel present at the exercise appeared knowledgeable and aware of their roles and responsibilities. The demonstration of staff briefings resolved ARCA #6 from the 1985 exercise. Excellent coordination of decision making and implementation of protective actions was maintained between the State EOC and Tensas Parish, and with the State staff at the GGNS EOF. Lack of a full staff at the EOC prevented, during both phases of the exercise, consideration of some of the specialized problems that fall under the jurisdiction and expertise of the missing agencies. Despite the missing staff, the EOC performed well during the analysis of incoming data and development of protective action recommendations, including concurrence with the evacuation recommendations initiated by the GGNS EOF, and in the consideration of appropriate ingestion pathway actions, including information to be released to the public. These actions resolved ARCA's #5 and #9 from the 1985 exercise. It is recommended that, in future exercises, those State agencies which were not represented in the EOC be included so that their perspectives and expertise may be accounted for in the exercise.

The EOC executive group reviewed the requirement for the use of KI by the state emergency workers. Based on radioiodine data received at the EOC, the decision was made not to recommend consumption of the KI in the field team's emergency kits. These actions resolved ARCA #7 from the 1985 exercise.

Communications with all appropriate locations and organizations, from the State EOC was, with one exception, excellent. The exception was the inability to initiate (ringdown) a call on the GGNS hot-line system (this problem was also experienced at the LNED offices in Baton Rouge). A back-up radio system, installed since the last exercise, provided improved communication capabilities with Tensas Parish. This backup radio installation resolved ARCA #4 from the 1985 exercise. Message handling, logging and distribution within the EOC were in accordance with established procedures and were effective and timely. ARCA #3 from the 1985 exercise was resolved by these actions.

The PIO at the EOC generated and released several simulated news releases during the exercise. Coordination of the content of these releases was accomplished, via fax transmission, with Tensas Parish, the Governor's office (simulated) and the State liaison at the GGNS Media Information Center (MIC) prior to their release. The messages were also provided to the State of Mississippi PIO at the MIC. These actions resolved ARCA #10 from the 1985 exercise.

At 8:50 a.m. on the first exercise day, the State EOC notified FEMA of the situation at the GGNS plant. Later in the day, a formal request for Federal assistance in aerial radiological monitoring and environmental sample collection was prepared and transmitted, through FEMA, to the appropriate agencies.

Recovery and reentry in Tensas Parish and the ingestion pathway zones were discussed on day 2 of the exercise. News releases were prepared, based on these discussions, that included information on special precautions for returning residents and agricultural interests in these areas. In the future, some consideration should be given to designation of farmers or other agricultural personnel as emergency workers so that they will have authorization to pass through road blocks or check points. Most livestock, and many other farming activities cannot be left unattended for the number of days that exclusion areas may need to be maintained. Some access, control and accountability of the personnel required to perform essential tasks in these areas must be maintained and emergency worker designation would meet these needs.

FEMA Objectives assigned to the State EOC (No's. 1, 2, 3, 4, 5, 10, 11, 12, 14, 15, 20, 21, 24, 25, 32, 34, 35, 36, 37, and 38) were adequately met.

DEFICIENCIES

87-1 Description:

The State EOC was unable to initiate (ringdown) a call on the GGNS dedicated hot-line system. This is a carryover Deficiency from the 1985 exercise.

NOTE: It was determined, during the post-exercise period, that an equipment malfunction had caused the problem. The problem has been corrected and all personnel have now been fully trained in the capabilities of the system.

Recommendation:

Since the source of the problem has been located and corrected, FEMA acknowledges that this Deficiency has been resolved. However, we recommend that the system be tested on a regular basis and efforts be made to ensure that all personnel are familiar with the capabilities of the system.

AREAS REQUIRING CORRECTIVE ACTION

87-1 Description: Once again (see ARCA #2 from the 1985 exercise), many of the State Agencies having a response assignment at the State EOC did not participate particularly during the ingestion phase. Therefore, capability for full activation and staffing

could not be classified as adequate. (NUREG 0654 E.1,E.2, N.1.b)

Recommendation: Those agencies and personnel having a response role at the EOC should be requested to participate during the next exercise.

AREAS RECOMMENDED FOR IMPROVEMENT

None.

2.1.3 STATE FIELD MONITORING ACTIVITIES

To meet exercise time constraints, the State Field Monitoring Teams (3) and Team Control personnel were pre-staged at the Ramada Inn in Natchez, Mississippi during the pre-exercise period. This location simulated the LNED office in Baton Rouge for the purposes of alerting, mobilization and initial briefings of the teams prior to deployment to exercise operating areas. Notice of the ALERT at GGNS was received at the prestaging area at 8:37 a.m. on day 1 of the exercise. The teams were immediately briefed and began an inventory and check-out of their team equipment kits. They remained on stand-by status until the notification of the Site Area Emergency was received at 10:35 a.m., at which time they deployed either to the GGNS EOF or the team staging area at the Tensas Parish EOC.

2.1.3.1 Field Team Control (at GGNS EOF)

LNED Field Team Control personnel arrived at the GGNS EOF at 12:14 p.m. Following a rapid setup in their operating area, a review of plant conditions and meteorological data was initiated. The Field Team Coordinator established radio communications with the Field Teams as they arrived at their staging area. Reliable communications were maintained throughout the exercise with no apparent "dead" spots observed in the areas covered by the field teams. There was a brief period of unexplained extraneous noise on the radio circuit that disappeared soon after it began. The EOF radio is equipped with a headphone/boom microphone to isolate the field team communicator from the background noise in the EOF. Communications with the State EOC, LNED offices and Tensas parish were via commercial telephone. A single instrument was operational at the LNED desk in the EOF. An additional line has been ordered and, when installed, will enhance the effectiveness of the LNED operation.

Following the declaration of the General Emergency, and after observing the apparent direction and speed of the exercise plume, the Field Team Coordinator deployed one team to the nearest point, on the west bank of the Mississippi River, where the plume would enter the state. Thereafter, direction and control of the field teams was effective and appropriate. Team locations were properly tracked on a detailed EPZ map which has a superimposed grid-line system which defined exact field positions. The field teams carry comparable maps and team directions are given by either grid position or by

pre-established monitoring points, which are also shown on the maps. The Field Team Coordinator and the LNED dose assessment staff worked closely together so as to direct the teams to those areas which would provide the most useful data. Team member exposure control was maintained by periodically requesting and recording team dosimeter readings. A timer was used to key these requests.

For day 2 of the exercise, the Field Team Control staff established their operational site at the Tensas Parish EOC. At that location, the LNED staff performed as well the second day as the first. Team briefings and direction and control activities were appropriate to the ingestion scenario and communications and data plotting functioned in the same manner as on day 1.

DEFICIENCIES

None.

AREAS REQUIRING CORRECTIVE ACTION

None.

AREAS RECOMMENDED FOR IMPROVEMENT

None.

2.1.3.2 State Field Monitoring Team #1

Field Monitoring team #1 was, along with all State field teams, pre-staged at the Ramada Inn in Natchez, Mississippi, the simulated LNED headquarters.

The field team demonstrated mobilization at the ALERT classification by receiving instructions on team member assignments and vehicle assignments to teams and by demonstrating equipment inventory and checkout procedures. Field Team 1 gave an excellent demonstration of the equipment inventory checklist procedure. However, Team 1 only gave a partial demonstration of the equipment and instrumentation battery test and operability test procedures. (The Ludlum Model 14C and end window GM detector were completely checked, i.e., both battery tested and source checked for operability. The Ludlum Model 2000 scaler was battery checked, however, neither the Ludlum Model 2000 scaler and NaI detector nor the Radeco air sampler were operability tested prior to deployment to the field. The Ludlum Model 2000 and NaI detector should have either had a source check or a background count run to determine the instrument operability and the Radeco air sampler should have been assembled and connected to the vehicle power supply to determine if the equipment was operating within the specified limits.) The field team members received a good briefing on exposure control procedures, plant conditions, and meteorological conditions prior to deploying to the field.

Team 1 had most of the appropriate field team equipment, check lists, and instrumentation documentation. Team 1 was assigned an excellent vehicle, equipped with four-wheel drive and a winch, for field monitoring purposes. The equipment kit procedures manual contained an equipment inventory list that was complete except for listing the silver zeolite cartridges. (There were three silver zeolite cartridges in the kit. The silver zeolite cartridges should be added to the inventory check list since they are an essential part of the radioiodine sampling equipment.) The equipment kit did not contain a true high-range survey meter. (The Ludlum Model 14C does have an internal GM detector tube which gives the instrument a maximum range of 2 R/hr. However, the off-the-shelf version of the Ludlum Model 14C is not compensated against failure due to detector saturation at high exposure rates. Therefore, a better high-range instrument would be a sealed ionization chamber type instrument equivalent to the CDV-715.) All of the instruments had been calibrated within the past year. However, the Radeco air sampler did not have a calibration sticker. (If there is some reason that a calibration sticker cannot be placed on the air sampler, a copy of the calibration log or certificate should be included in the equipment kit procedures manual.)

Field team 1 gave a good demonstration of the technical operations and procedures required for monitoring ambient radiation levels both during the day 1 plume surveys and the day 2 ground deposition surveys. The Ludlum Model 14C GM survey instrument was appropriately battery checked and source checked prior to going into the field. During the plume surveys, the survey meter detector was appropriately protected from contamination by a plastic covering. The team members conducted both ground level and waist height measurements. Open and closed window measurement techniques were demonstrated. The closed window measurements were accomplished by placing an aluminum plate over the thin end window of the external GM detector. As indicated in the previous paragraph, the team did not have a true high-range survey instrument.

Team 1 had the appropriate equipment for sampling and measuring radioiodine concentrations of 10^{-7} μ Ci/cc in the presence of noble gases. However, the team members appear to need additional training on the air sampling procedures. (This training should include: 1) equipment and instrument check before going into the field, 2) proper assembly of the air sampler filter head, i.e., the particulate filter was upside down and in direct contact with the iodine adsorber cartridge rather than in its specific portion of the filter head, and 3) the air sampling apparatus was assembled at the assigned monitoring location in the field. This necessitates opening the the equipment kit and potentially contaminating all the equipment within the kit. Also, assembling the air sampling apparatus at the monitoring location adds some unnecessary exposure time to the field team members, if the location is in the plume.) Note: The assigned air sampling location was not in the plume, but discussions with the team members indicated that the team members were not aware of the potential equipment contamination problem.

The team members demonstrated that they could follow maps of the area, however, there seemed to be a terminology comprehension problem which, in one instance, led the team to the wrong location (controller intervention ultimately corrected the problem). The case in point was the first monitoring assignment to location M-10, a fixed monitoring location at the grain elevators and the old ferry

landing on the river. The more senior team member ad hoced a combined sector and grid system which put the team in grid location 5 south 10 west, whereas, the fixed monitoring point M 10 is at 10 miles, but it is in grid location 5 south 9 west. It would appear that additional training is in order regarding the fixed monitoring designations and the proper use of the grid coordinate map system.

Field team 1 demonstrated environmental sample collection procedures for soil, water and vegetation on day 1 and day 2 of the exercise. Some sample collection procedural problems were noted and discussed on day 1. These issues were corrected on day 2, but this indicates that additional refresher training may be warranted. The field team members were following the written procedures, but they were unaware of the following potential problem areas:

1) Soil Sampling

   - The soil sample was collected from a sheltered area under a large tree.

   - The soil sampling procedure calls for taking a 100 cm^2 soil sample from an area that is free of surface debris. The team member, collecting the soil sample, cleared the area of debris by scraping the surface with his trowel. This debris clearing step also removed the upper layer of soil which would have contained the majority of the freshly deposited contamination. This would bias the sample toward the low side.

2) Vegetation Sampling

   - The vegetation sample was also collected from a sheltered area under a group of large trees.

3) Other Sampling Issues

   - All environmental samples collected from unevacuated areas within the ingestion planning zone should be collected from locations which are well away from traveled roadways. This will help prevent the samples from being biased high by resuspension caused by vehicular traffic.

   - Exercise contamination control at all times--no detectable measurement on the survey meter does not mean that the area is not contaminated. For example , ground deposition of I-131 at the preventive PAG (0.13 µCi/m2) will give a waist height gamma exposure rate of approximately 1 µR/hr. This cannot be distinguished from background by field measurements.

   - Consider adding a collection area to the sampling procedure, i.e., 1 m^2, etc.. This is not important for assessing potential

ingestion dose but it may have an extra sampling trip when it comes to evaluating the relocation criteria that are being proposed by the Environmental Protection Agency.

The team members demonstrated good double-bagging procedures to help prevent cross contamination of the environmental samples, however, it would have been helpful if more of the larger size bags were available in the equipment kits. Also, the team may want to consider designating a single large, heavy duty bag as a contaminated waste receptacle. This waste bag could be mounted on the inside wall of the vehicle--this would provide easy access for disposing of gloves and other contaminated items.

One word, excellent, could summarize the field team communications. The team 1 team members demonstrated excellent radio protocol. Radio communications were maintained throughout the 10-mile EPZ and no "dead spots" were encountered. In addition to the vehicle radio for communicating with the EOF, team 1 was assigned a hand-held radio with a different frequency for maintaining communications with the St. Joseph EOC. During the plume phase of the exercise, the EOF kept the field teams well informed about plant conditions, meteorological conditions, and protective actions that were in effect.

Field team 1 gave an excellent demonstration of field team exposure control on both day 1 and day 2 of the exercise. The team members were equipped with the appropriate direct reading dosimeters and permanent record dosimetry. The direct reading dosimeters were read at 30-minute intervals and the appropriate exposure records were maintained. The equipment kits contained appropriate protective clothing and equipment as well as KI. The team members were familiar with the use of the protective clothing and equipment. The team members demonstrated knowledge of the criteria for taking KI and they knew the administrative exposure limits that were in force during the exercise. These emergency exposure limit criteria were also permanently mounted on the visor of the emergency vehicle -- this is excellent.

Field monitoring team 1 successfully demonstrated all applicable exercise objectives (numbers 1, 5, 6, 7, 8, 9, 20, and 36) during the plume and ingestion pathway field monitoring activities. Objectives 1, 5, 20 and 36 were well demonstrated. Objectives 6, 7, 8, and 9 were demonstrated, however, some weaknesses in training, equipment and procedures were noted.

DEFICIENCIES

None.

AREAS REQUIRING CORRECTIVE ACTION

87-2 Description: Several instances of weakness were observed in surveying and sample-taking techniques. (NUREG-0654 0.4.c)

Recommendation: The field team should receive refresher training in the following areas:

- Pre-deployment equipment check procedures and operability tests.
- Procedures for assembling the air sampling equipment (when, where, how).
- Use of the grid-coordinate map system and the fixed monitoring point system.
- Procedures for soil and vegetation sampling, particularly choice of sampling locations.

AREAS RECOMMENDED FOR IMPROVEMENT

- Description: Written field team procedures do not include instructions to purge air sampling cartridges with clean air prior to counting the cartridge in the field.

  Recommendation: Add clean air purge instructions to the written procedures.

  Discussion: The clean air purge will remove any noble gases from the void spaces within the iodine filter cartridge. Test data has shown that the purge will reduce the noble gas contribution to the gross sample count by a factor ranging from 50 to 100. However, any error that may be introduced by not purging the cartridge will be on the conservative side, indicating positive for iodine when iodine may or may not be actually present in the sample.

- Description: The written procedures did not contain several items that would enhance environmental sampling procedures and the team members were not aware of their significance.

  Recommendation: Add the following precautionary notes or steps to the team procedures manual:

  1) Soils [illegible] vegetation sample locations should be selected from areas well away from roads having vehicular traffic. This will help [illegible] samples that may be biased by resuspended [illegible]. This is especially important for any areas within the deposition footprint but outside of [illegible] evacuated.

2) Contamination control must be exercised at all times. Lack of a reading on a survey meter does not always mean that there is no contamination present. For example, I-131 at the preventive PAG (0.13 $\mu Ci/m^2$) level has an exposure rate, at one meter, of about 1 $\mu R/hr$ -- below the normal background rate. The emergency PAG concentration level would have an exposure rate of 10 $\mu R/hr$-only about double the normal background rate.

3) Lining the equipment and sample storage areas of the team vehicles may aid in preventing some contamination of the vehicle. Also, attaching a contaminated waste ba to the inside (or even outside) of the vehicle would provide a convenient location for the deposit of contaminated gloves or other small items that may accumulate during multi-location sampling operations.

- Description: The Field Team equipment kit did not include a true high-range survey meter. The Ludlum Model 14C included in the kit has a maximum range of 2 R/hr. However, it is not compensated against detector saturation at high exposure rates. This could lead to the instrument readings of zero in a high exposure rate field. (NUREG-0654 H.7)

  Recommendation: The field team should be equipped with one high-range survey meter, of the sealed ionization chamber type, that could not be saturated in a worst case radiation field.

2.1.3.3 State Field Monitoring Team #2

Field Team #2 was pre-staged, as were all LNED teams, at the Ramada Inn in Natchez, Mississippi. Following receipt of the ALERT classification notification, the team was fully briefed on plant and meteorological conditions. The team then inventoried their emergency equipment against their check list and performed appropriate operational checks. The equipment list did not include a high-range survey meter and the team did not have one. The list also did not include silver zeolite air sampling cartridges, although the team had them in their kit. All team instruments had recent calibration stickers except for the air sampler, which had no sticker.

Following receipt of the Site Area Emergency notification, Team #2 deployed to the LNED staging area at the Tensas Parish EOC where communications checks and final operational checks were performed. When the General Emergency was declared, and the plume direction and speed had been established, the Field Team Coordinator at the GGNS EOF directed the field team, by radio, to selected monitoring and sample collection points. Radio equipment and procedures functioned well throughout the exercise with no dead spots or problems encountered. The team experienced no difficulty in locating the sites to which they were directed by the Field Team Controller.

The team demonstrated proper techniques and skills in monitoring, air sampling and obtaining samples of soil, water and vegetation. All samples were properly handled, double bagged and identified. Contamination control procedures were followed. The team equipment kit contained written procedures for team operations and these were referred to and carefully followed. Exposure control procedures were observed with personal dosimeter readings made, recorded and reported to team control at appropriate intervals.

Near the end of exercise day 1, team #2 collected the samples obtained by the other field monitoring teams and transported them to the LNED low level counting lab in Baton Rouge. This activity terminated the team's participation in the exercise.

All exercise objectives assigned to Field Monitoring Team #2 (1,5,6,7,8,9,20 and 36) were met.

DEFICIENCIES

None.

AREAS REQUIRING CORRECTIVE ACTION

None.

AREAS RECOMMENDED FOR IMPROVEMENT

None.

2.1.3.4 State Field Monitoring Team #3

To meet exercise time requirements, Field Monitoring Team #3 was pre-staged, as were all LNED response personnel, at Natchez, Mississippi.

Following the receipt of the declaration of Alert, the team was fully briefed on the situation and placed on stand-by for deployment. During the stand-by period, the team reviewed their inventory of supplies and equipment, their monitoring and sample collection procedures manual and maps related to the GGNS EPZ.

When the Site Area Emergency declaration was received at the pre-staging area, the monitoring team was deployed to the staging area at the Tensas Parish EOC in St. Joseph, La. The team took background counts for reference purposes and established communications with LNED Field Team Control at the GGNS EOF. Communications functioned well throughout the exercise.

Following the General Emergency declaration, field team #3 continued to stand-by at the Parish EOC until initial readings indicated the arrival of the plume at that location. The team took an air sample from the plume and, as directed by team control,

moved out of the plume to obtain a clean reading on the sample. Results of the readings were communicated to Field Team Control.

As directed by Field Team Control, the team then obtained a set of soil, water and vegetation samples which were transferred to team #2 for transport to the LNED Lab in Baton Rouge. At the completion of these activities, exercise activity was suspended until the following day.

For day 2 of the exercise, the team returned to the Tensas Parish staging area where they were briefed and deployed to perform ingestion pathway activities. The briefings included sketch maps of 'hot-spots' identified by simulated aerial monitoring. Team assignments included further definition of the boundaries of the contaminated areas and sampling of soils and vegetation in these areas.

Throughout both days of the exercise, Team #3 demonstrated a thorough grasp of monitoring and sampling procedures and techniques, and considerable skill in operations. The team also displayed ingenuity and initiative when, during their sample taking activities, they observed that a water course drained the contaminated area and called team control to request authorization to take water samples to determine contamination levels in the run-off.

All objectives assigned to Field Team #3 (Nos.. 1,5,6,7,8,9, 20 and 36) were fully met.

DEFICIENCIES

None

AREAS REQUIRING CORRECTIVE ACTION

None.

AREAS RECOMMENDED FOR IMPROVEMENT

- Description: The silver zeolite canisters included in the Field Team Kit were not included on the inventory sheet in the team procedures manual.

  Recommendation: Modify the inventory sheet to include the silver zeolite canisters.

- Description: The Field Team Kit contained only two large sample collection bags, and no large bags were included on the inventory sheet.

Recommendation: A larger number of large bags should be included in the kit and they should be shown on the inventory sheet.

2.1.4 STATE DOSE ASSESSMENT (GGNS EOF)

State dose assessment personnel were pre-staged at the Natchez, Mississippi Ramada Inn along with all state field response units. Following receipt of the ALERT notification, they participated in the briefings provided to the field teams and prepared for deployment. When the Site Area Emergency notification was received, they departed for the GGNS EOF, arriving at approximately 12:15 p.m. On arrival, the team promptly set up their work area and began their work.

The GGNS EOF has excellent physical facilities which allow and promote timely and accurate dose assessment activities and good interaction between utility and State dose assessment teams. In the relatively brief time between team arrival and the termination of the day 1 (plume exposure) exercise activity, most of the dosage data was derived from plant rather than field team data. However, field data that was received was used in assessment activities, and the State dose assessment capability was demonstrated.

In accordance with plans and procedures, the team received data, made calculations and forwarded recommendations for protective actions to the State EOC in Baton Rouge. Communications with the State EOC were via the single telephone line now available in the State working area at GGNS. A second telephone line has been ordered and will enhance communications when installed. State field monitoring control shared the working space with the dose assessment team and this co-location ensured close coordination and cooperation between these State functions. The dose assessment team had a thorough grasp of the demographics of the areas of interest. This knowledge, together with dosage data would have yielded a good estimate of total population dose. Throughout the exercise, the team demonstrated good judgment in developing and confirming data and recommending appropriate protective actions.

On the second exercise day, the dose assessment team operated from the Tensas Parish EOC from where they provided pre-scripted inputs to the State EOC.

Exercise objectives assigned to the State dose assessment team (Nos.. 10, 11, 12 and 33) were met.

DEFICIENCIES

None.

AREAS REQUIRING CORRECTIVE ACTION

None.

AREAS RECOMMENDED FOR IMPROVEMENT

- Description: The single telephone line now available for State operations at the GGNS EOF limits the collection and reporting of data.

  Recommendation: Request the earliest possible installation of the already ordered second telephone line .

2.1.5 Emergency News Media Center

To meet State and local exercise objectives, LNED and Tensas Parish sent spokespersons to the GGNS Emergency News Media Center (ENMC) on day one of the exercise. This was a positive step resulting in better coordination of information with other organizations than had been the case in past exercises.

The revised mode of State/local media operations resolved, to a great extent, ARCA's (Nos.. 17 and 18) from the 1985 exercise. Initial problems in coordinating information, in part attributable to Louisiana and Tensas Parish being new partners at the Media Center, became less significant as the exercise proceeded. If this partnership is to continue, either the State's representatives, or those managing the ENMC, need to act to ensure that it is a full partnership. For example, copies of Louisiana's press releases, though readily available to the ENMC staff, were never made available at media briefings. Also, Louisiana's spokespersons were not recognized at the first news briefing nor was there any reference to the situation in Louisiana. Additionally, Louisiana's representatives might consider developing press kits similar to those made available by Mississippi and utility representatives. These kits would more clearly identify Louisiana's partnership in the media center's operations. As current plans do not specify what constitutes full staffing or participation by the State or Tensas Parish at the Media Center, mobilization and activation objectives were considered to be partially met.

Communications to and from the media center, by telephone and hard copy, functioned well throughout the exercise. State and local representatives were able to coordinate, and obtain concurrence on all proposed releases.

Rumor control activities could not be effectively evaluated at the ENMC because no significant rumor control activities were conducted there. Therefore, ARCA #19 from the 1985 exercise could not be considered to have been resolved. It is not clear to the evaluators exactly what rumor control system does exist, and the extent to which it is coordinated with such activities conducted by Mississippi and utility representatives.

Media activities on day two of the exercise involved the preparation of news releases, related to the ingestion pathway, at the State EOC in Baton Rouge.

In general, Louisiana and Tensas Parish need to settle on one system for accommodating the news media and for rumor control. This system should be reflected in plans, exercises and drills. They should ensure that whatever system is developed is

compatible with, consistent with and coordinated with those of other parties involved. The current plans for GGNS are not on a par with those for the other nuclear plants in Louisiana (River Bend and Waterford 3) and lack definition in the points of contact for the media (exactly where they should go to receive all available information), in how and where media phone contacts will be handled, and in how and where rumor control activities will be conducted.

For improved realism, and to provide a more meaningful test of public information arrangements, it is suggested that exercise players be assigned to act as media persons to continually "pulse" the system by phone, and in person, at various locations. Doing this would, at the very least, assist the State and Parish in better defining their planning needs.

FEMA Exercise Objectives #5, 24 and 25 were fully met, #'s 1 and 2 were partially met and #26 was not observed.

DEFICIENCIES

None.

AREAS REQUIRING CORRECTIVE ACTION

87-3 Description: State and Parish plans do not reflect current modes of staffing or conducting media or rumor control activities, nor do they adequately define points of contact for these activities. (NUREG-0654 G.3.a)

Recommendation: The State and the Parish should settle on a final system that accommodates the media and the public, and ensure that this system is described in plans and procedures, and tested in the next exercise.

AREAS RECOMMENDED FOR IMPROVEMENT

None.

2.2 LOCAL JURISDICTIONS AND SUPPORT ORGANIZATIONS

Exercise participation by local organizations included the Tensas Parish emergency organization at the Parish EOC, a demonstration of traffic control activity, a demonstration of a monitoring/decontamination center, operations at the Ferriday Reception/Care Center in Concordia Parish and the operations of the Mahoney Ambulance Service. Detailed discussion of specific performance at each of these locations is provided in location narratives that follow. Successful demonstration of all

stated exercise objectives indicated a satisfactory level of local emergency response capability.

2.2.1 Tensas Parish EOC

The Tensas Parish EOC is located in the Parish Courthouse in St. Joseph, Louisiana, approximately thirteen miles west-southwest of the Grand Gulf Nuclear Station. The joint Emergency Management/Sheriff's communications center is in a separate building adjacent to the Courthouse. All communications are monitored there on a 24-hour basis. As is normally the case, one sheriff's communicator was on duty when the initial notice of the ALERT was received from GGNS on the hot-line system. A second communicator was immediately assigned to the center for the duration of the exercise. The Parish C.D. Director was immediately notified. He can be contacted, as required, by phone, mobile radio, home radio or pager.

Following his notification, the C.D. Director initiated a stand-by alert call, to all EOC personnel, using a written roster. Following the Site Area Emergency declaration, a second (activation) call was made to all participants. Full staffing was in attendance at the EOC at 11:00 a.m. A total of 24 EOC staff personnel participated in the exercise representing; Parish C.D., Parish Police Jury, City of St. Joseph, State Police, State LEOP, State Fish and Wildlife, State Office of Family Security, the Council on Aging, Parish Health Department and several volunteers who serve as administrative staff and message runners.

The Parish C.D. Director, and his assistant, were very obviously and effectively in charge of the EOC and all exercise functions related to the parish. His activities coincided with the plan which was available in the EOC and frequently referenced. He frequently consulted with his staff and gave periodic briefings, insuring that all present were kept informed of all aspects of the exercise. The staff had written checklists and procedures manuals available and used them in the performance of their duties.

The EOC room is barely adequate for the number of active participants. Each representative did however, have a desk or other work space and a chair. The Parish plans to build a 3,300 square-foot addition to the existing building that houses the communications center. The addition will provide adequate space for the EOC and the communications center to be located in the same facility, eliminating the need for runners to move messages from one building to another. The present EOC has kitchen facilities, bunks and showers (sheriff's jail facilities) and is equipped with emergency power. Despite somewhat crowded conditions, the noise levels in the EOC were adequately controlled. EOC security was provided by sheriff's officers and was very effective.

EOC maps and display materials were adequate and frequently used throughout the day for posting significant events and latest emergency classification levels. Plume data, as received, was charted. Information on evacuation routes, access control points, monitoring points and relocation points was available but not posted in the EOC.

Should evacuation of the EOC be required, the Parish Emergency Management Office has developed a well equipped mobile command post with radios, road-block materials, status boards, entry suits, auxiliary power, etc., to serve as an emergency, minimum capability EOC. The parish also has a four-wheel drive vehicle with radios, speaker system, winch and auxiliary power which can be used for alert/notification in rural areas and assistance in evacuation.

Communications in Tensas Parish is located in the Sheriff's office. Systems include dedicated landline (the "hot-line") to GGNS, LNED. LOEP and Mississippi, police radio, C.D. radio, law enforcement teletype, facsimile and commercial telephone. The landline systems are equipped with an automatic recorder for record purposes, and a remote speaker. All communications received at Tensas Parish were promptly answered and on completion of the three-copy message form by the communicator, the message was immediately hand-carried to the EOC. Message handling was very effective. The only problem that surfaced involving communications was the occasional illegibility of the handwriting of some communicators. We recommend that the communicators be instructed to be more careful concerning the legibility of the messages that they record on the message forms.

Alerting and notification of the public, and dissemination of an initial instructional message was effectively handled by the Parish C.D. Director. At 1:26 p.m., the Parish Police Jury President and Mayor of St. Joseph approved the decision to evacuate Areas 10 and 11. The C.D. Director directed sounding of the sirens (simulated) and activation of the tone alert radios (simulated) and, at 1:28 p.m., actually read the message that would have been transmitted on the tone alert system. At 1:34 he called radio station KNOW, which has been designated as the Emergency Broadcast System network station, and has been supplied a facsimile machine and training, and TV Channel 8, and read the drill message. This entire A/N procedure was completed in eight minutes, well under the 15-minute requirement. On three separate occasions, public information/action messages were drafted, circulated for concurrence and promptly read over the phone to the EBS station. A&N messages are provided to institutions (schools, hospitals, etc.) in the Parish via the tone alert radio system or over the phone.

A Parish representative was sent to the GGNS Emergency Media Center to ensure coordination of all media releases with the other agencies (states, utility, etc.) represented there. Information intended for the public was coordinated with the Police Jury President, Mayor and other EOC staff members prior to being released. Rumor control was handled entirely by the Parish C.D. Director. He personally answered three calls from "concerned citizens" regarding various aspects of radiation exposure and evacuation procedures. In a small Parish like Tensas, where everyone knows the C.D. Director personally, his personal attention to these calls appears to be an effective way to handle rumor control. However, he has many duties during an emergency and, if the rumor control requirement becomes too great, his other responsibilities could suffer. Therefore, we feel that this situation should be closely monitored and others should be trained to assume this function if necessary.

Radiation exposure control was effectively managed at the EOC. The C.D. Director conducted hourly surveys of the entire facility with a survey meter, and high range, direct reading (0-200 R) dosimeters were charged, zeroed and issued to all

workers. Several of the issued dosimeters were reported to be "drifting" providing false readings of exposure. We recommend that workers be provided with a more accurate permanent record dosimeter such as a TLD. The parish has fourteen TLD's that are reserved for use "in the field". One individual at the EOC was delegated the responsibility to ensure that all workers read and recorded their dosimeter readings every thirty minutes.

An adequate supply of KI is available at a local pharmacy. On notification by the C.D. Director, the pharmacist delivers the KI to the EOC and administers it to all workers, with instructions regarding its effects. A record is maintained of those who are offered KI. On day 2 of the exercise, the Health Department representative contacted the State Health Department and obtained approval, based on anticipated (simulated) dosages, for issuing KI. On request of the C.D. Director, the local pharmacist responded to the EOC, actually approached each worker and offered them a dose of simulated KI.

Following the decision to recommend evacuation of protective action areas 10 and 11, the Parish C.D. Director conferred with the members of his staff and reviewed his plans and procedures for evacuation and traffic control. Actions appropriate to those plans were simulated. Representatives of the Parish Sheriff's office and the Louisiana State Police, operating from the EOC, are responsible for management of evacuation, traffic and access control and are assisted in the field by personnel from the State Highway Department.

The Tensas Parish C.D. Director advised the Concordia Parish Director of the recommended evacuation and the need to activate the reception center at Ferriday. Following its activation, the reception center frequently communicated current status to the Tensas EOC by radio and/or telephone.

Day 2 of the exercise began at 8:00 a.m. with a briefing by the C.D. Director to update players on the status of the exercise. Exercise inputs concerning ingestion pathway problems were considered by the EOC staff and solutions devised. Based on exercise conditions, controlled reentry and recovery issues were also reviewed and appropriate messages prepared for public release.

All FEMA exercise objectives assigned to the Tensas Parish EOC (Nos. 1, 2, 3, 4, 5, 12, 13, 14, 15, 20, 22, 23, 24, 25, 26, 34, 36, 37, 38 and 39) were met.

DEFICIENCIES

None.

AREAS REQUIRING CORRECTIVE ACTION

None.

AREAS RECOMMENDED FOR IMPROVEMENT

- Description: An occasional problem was encountered in reading communicator handwriting on message forms.

  Recommendation: Communicators should be advised to take extra care to insure that their handwriting is legible.

- Description: The high-range dosimeters issued to EOC emergency workers tended to "drift" giving false readings.

  Recommendation: Issue a permanent record dosimeter such as a TLD to all emergency workers.

2.2.2 Traffic Control Point

Following the directions of the Tensas Parish EOC staff, and written plans and procedures, a traffic/access control point was established at the intersection of highways 604 and 605 by the State Highway Department. Personnel manning the control point were knowledgeable of evacuation routes, reception center locations and procedures for establishing and operating the control point. One of the team members was very knowledgeable in the use of protective equipment but three of the personnel indicated that they did need refresher training in the use of dosimeters and survey meters.

Highway department vehicles at the control point were equipped with radios capable of communicating with their base station and the Parish EOC and demonstrated this capability as required.

FEMA exercise objectives assigned to the traffic control point (Nos.. 15 and 17) were met.

DEFICIENCIES

None.

AREAS REQUIRING CORRECTIVE ACTION

None.

AREAS RECOMMENDED FOR IMPROVEMENT

- Description: State Highway Department personnel manning the traffic control point indicated a need and desire for refresher training in the use of dosimeters and survey meters.

Recommendation: Required training should be provided to Highway Department personnel.

2.2.3 Monitoring/Decontamination Center

Radiological monitoring and decontamination would normally be conducted at the decontamination/relocation center at Ferriday High School in Concordia Parish. In situations when emergency personnel and/or vehicles cannot be spared, monitoring and decontamination can be carried out in an area adjacent to the Tensas Parish Courthouse in St. Joseph. This was the activity demonstrated in this exercise.

The Parish EOC was notified, by radio, that a possibly contaminated sheriff's vehicle was enroute to the courthouse for monitoring. The Parish RDO (Radiological Defense Officer) was paged by the EOC and made preparations to monitor and, if necessary, decontaminate the vehicle, and it's driver, when they arrived. Anti "C" clothing, survey meters and other equipment for monitoring and decontamination are stored, and readily available for use, at the EOC.

When the vehicle arrived, it's exterior was monitored and found to be contaminated on the tires and air filter. The vehicle was then directed to a wash area located behind the jail and decontamination by washing was simulated. Any contaminated wash water would be contained in a ditch adjacent to the wash area for later disposal. The driver remains inside the vehicle while these operations are carried out. The decontaminated vehicle was then directed to the side of the jail where a mobile trailer equipped with a shower was located. The vehicle's driver was then monitored and directed to the trailer where decontamination was simulated. The trailer's plumbing can be disconnected and contaminated wash water directed to a tank for later disposal. While the driver decontamination was underway, the interior of the vehicle was monitored, found to be contaminated and decontamination processes were demonstrated.

During the monitoring of the exterior of the vehicle, the monitor removed and handled the vehicle's air cleaner (which was contaminated), then handled the survey instrument and it's probe. This action could have contaminated the instrument and caused faulty readings during other monitoring operations.

FEMA exercise objectives Nos.. 1, 2, 5 and 29 were adequately demonstrated.

DEFICIENCIES

None.

AREAS REQUIRING CORRECTIVE ACTION

87-4 Description: While monitoring the exterior of the exercise vehicle, the monitor removed and handled the vehicle's air cleaner. He then handled his survey instrument and probe, which

would have contaminated them, resulting in faulty readings during later monitoring operations (NUREG-0654 K.5.b).

Recommendation: Monitors should be provided refresher training on the prevention of cross-contamination.

AREAS RECOMMENDED FOR IMPROVEMENT

None.

2.2.4 Ferriday Reception/Care Center

The Ferriday Reception/Care Center, located in the Ferriday High School gymnasium, was effectively managed by the Ferriday Fire Chief, assisted during the exercise by the Concordia Parish C.D. Director. The center staff was placed on stand-by status at the Alert Notification level. When evacuation of selected portions of the EPZ was recommended by Tensas Parish officials, activation of the center and staff was ordered by the Concordia Parish C.D. Director. The Tensas Parish C.D. Director advised Concordia Parish of the anticipated arrival time of evacuees and the approximate number to be expected. Approximately 28 minutes were required to notify and assemble the Center staff. Only 13 additional minutes were required to prepare the Center to receive evacuees. The facility appears to be entirely adequate to provide mass care for the number of evacuees anticipated.

Communications capabilities at the Reception Center consist of commercial telephone, hand-held radios and a mobile radio (in the Parish C.D. Director's car) providing a direct link to the Tensas Parish EOC. Effective communications were demonstrated, throughout the exercise period, between the Reception Center and Concordia and Tensas Parishes.

Evacuees arriving at the Reception Center are screened for radiological contamination at the entrance to the gymnasium. Those found to be radiation free are directed to a registration desk for processing. Those found to be contaminated are separated and sent to separate male and female showers along paper walkways which are frequently monitored and changed as required. In the shower area, contaminated clothing is collected and placed in plastic bags, inside other containers, and held for later disposal. After the evacuees are decontaminated, they are remonitored and, if clean, are issued replacement clothing and sent to the registration desk for further processing. Adequate equipment was available for monitoring of evacuees and the monitors had appropriate protective clothing and personal high range dosimeters (0-200 R). In most cases, the emergency workers demonstrated adequate training and knowledge of their duties and responsibilities. However, a number of small errors in personnel monitoring techniques were observed. We recommend that monitoring personnel be provided some additional training in the use of the CDV-700 for personnel monitoring.

All exercise objectives assigned to the Ferriday Reception/Care Center (Nos.. 1, 2, 5, 27, 28 and 39) were adequately met.

DEFICIENCIES

None.

AREAS REQUIRING CORRECTIVE ACTION

None.

AREAS RECOMMENDED FOR IMPROVEMENT

- Description: A number of small errors in monitoring techniques were observed.

  Recommendation: Provide additional training in the use of the CDV-700 for personnel monitoring.

2.2.5 Emergency Medical Services (Mahoney Ambulance Service)

The ambulance service was requested, by radio from the Tensas Parish EOC, to respond to a (simulated) accident location where a farm worker had been injured in a tractor incident. They were advised that the injured person was possibly contaminated with radioactive material. The responding ambulance was fully equipped with all necessary medical supplies and equipment, and with protective clothing, survey meters and dosimeters for radiological protection and contamination control. The crew was well trained and described, in detail, their procedures for patient handling, monitoring and contamination/decontamination management.

FEMA exercise objectives assigned to the ambulance service (Nos.. 5, 20 and 30) were met.

DEFICIENCIES

None.

AREAS REQUIRING CORRECTIVE ACTION

None.

AREAS RECOMMENDED FOR IMPROVEMENT

None.

3 TRACKING SCHEDULE FOR STATE/LOCAL ACTIONS TO CORRECT DEFICIENCIES AND AREAS REQUIRING CORRECTIVE ACTION

Section 2 of this report has provided descriptions of any Deficiencies or Areas Requiring Corrective Action resulting from this exercise, or remaining to be corrected from previous exercises, with recommendations noted by the Federal Evaluators. The evaluations and recommendations were based on the applicable planning standards and evaluation criteria set forth in Section II of NUREG-0654/FEMA-REP 1, Rev. 1 (November 1980), and preapproved exercise objectives.

TABLE 1 provides a consolidated listing of these exercise Deficiencies and Areas Requiring Corrective Action, by exercise activity location. The table has been designed so that space has been allowed for the addition of: (1) proposed corrective actions that will be undertaken and (2) the projected and actual dates of completion of these actions.

The FEMA Region VI Director is responsible for certifying to the FEMA Associate Director, State and Local Programs and Support, Washington, D.C., that any Deficiencies and Areas Requiring Corrective Action noted in the exercise have been or will be corrected, and that such corrections will also be incorporated into emergency plans as appropriate.

FEMA Region VI requests that the State of Louisiana, and other participants in the Grand Gulf Nuclear Station exercise, submit those measures that they will take or intend to take to correct the problems noted by the Federal Evaluators. If corrective actions are necessary, and remedial actions cannot be instituted immediately, Region VI will request that a detailed plan to accomplish the corrections, including projected dates of accomplishment, be provided by the State.

TABLE 1 Remedial Actions for the November 17-18, 1987 Grand Gulf Nuclear Station Exercise

Deficiencies and/or Areas Requiring Corrective Action -- with FEMA/RAC Recommendations for Correction	FEMA Exercise Objective No(s)	NUREG-0654 Reference	State (S) and Local (L) Proposed Corrective Actions	Proposed Completion Date	FEMA Evaluation of State and Local Corrective Actions and Determination of Adequacy	Actual Completion Date
DEFICIENCIES 87-D1 LNED Office and LOEP EOC **Description:** Neither LNED nor LOEP were able to initiate (ringdown) calls on the GGNS hot-line system. NOTE: This same deficiency had been noted at the 1985 exercise, but was believed to have been resolved in 1986. **Recommendation:** Determine what is wrong with the system at these two locations, and make it operational.	5	F.1.b	The day following the exercise, the LNED hot-line drop was tested and found to be operational. Tests of the LOEP EOC hot-line drop revealed an equipment mal-function. The equipment has been repaired and fully tested and the entire system is now operational.	11/19/87	FEMA accepts that the hot-line system is now fully functional at all locations (Ref: State of Louisiana letter dated 11/25/87). However, the system will be retested at the next exercise.	11/19/87
AREAS REQUIRING CORRECTIVE ACTION 87-1 STATE EOC (LOEP Office) **Description:** Many of the State Agencies assigned response roles, at the EOC, in the State plan, did not send representatives there for this exercise (also an ARCA at the 1985 exercise). **Recommendation:** Those agencies and all personnel having a response role at the EOC should be requested to participate during the next exercise.	2	E.1, E.2 & H.4	Add'l state agencies will be requested to participate in the next exercise.	Next exercise	FEMA accepts that additional state agency representatives will be requested to participate.	

TABLE 1 Remedial Actions for the November 17-18, 1987 Grand Gulf Nuclear Station Exercise (Cont'd)

Deficiencies and/or Areas Requiring Corrective Action -- with FEMA/RAC Recommendations for Correction	FEMA Exercise Objective No(s)	NUREG-0654 Reference	State (S) and Local (L) Proposed Corrective Actions	Proposed Completion Date	FEMA Evaluation of State and Local Corrective Actions and Determination of Adequacy	Actual Completion Date
87-2 STATE FIELD MONITORING TEAMS **Description:** Several instances of weakness were observed in surveying and sample taking techniques. **Recommendation:** Provide refresher training in the following areas: - Equipment check procedures and operability tests - Air sampler assembly and use - Use of the Map Grid System - Soil and vegetation sampling procedures and location choices	7, 8, & 9	I.8,I.9, I.10,I.11 & O.4.c	Add'l training will be provided	9/30/88	FEMA will re-evaluate at next exercise.	
87-3 MEDIA INFORMATION CENTER **Description:** State and local plans do not reflect current modes of conducting media or rumor control activities, nor do they define the points of contact for these activities. **Recommendation:** The State and local authorities should settle on a final system that accommodates the media and the public, and ensure that it is fully described in plans and procedures, and tested in drills and exercises.	24,26	G.3.a, G.4.a, G.4.b	Final system has been adapted and will be included in updated plans and procedures.	6/88	FEMA will re-evaluate at the next exercise.	

TABLE 1 Remedial Actions for the November 17-18, 1987 Grand Gulf Nuclear Station Exercise

Deficiencies and/or Areas Requiring Corrective Action -- with FEMA/RAC Recommendations for Correction	FEMA Exercise Objective No(s)	NUREG-0654 Reference	State (S) and Local (L) Proposed Corrective Actions	Proposed Completion Date	FEMA Evaluation of State and Local Corrective Actions and Determination of Adequacy	Actual Completion Date
AREAS REQUIRING CORRECTIVE ACTION (Cont'd) 87-4 TENSAS PARISH MONITORING/ DECONTAMINATION CENTER **Description:** During the monitoring of the exterior of the exercise vehicle, the monitor handled the contaminated air cleaner, then handled his instrument and its probe. **Recommendation:** Provide refresher training on prevention of cross-contamination.	29	K.5.a, K.5.b	Training will be provided.	9/30/88	FEMA will re-evaluate at the next exercise.	

4 EVALUATION OF OBJECTIVES

4.1 SUMMARY OF FEMA OBJECTIVES REMAINING TO BE MET

All but one of the 39 FEMA Region VI exercise objectives have been met during the current six-year exercise cycle. Table 2 describes the remaining objective.

4.2 FEMA OBJECTIVES TRACKING - GRAND GULF NUCLEAR STATION

Table 3 provides a comprehensive tracking system of FEMA Objective, NUREG-0654 Reference Elements, Latest Exercise Objectives, Jurisdictional Responsibility, Exercise Dates, Identified Deficiencies/Required Corrective Actions and the Date Objectives were met by State and local agencies. This system tracks the status and progress of this data through the six-year exercise cycle during which all objectives must be met.

TABLE 2 Summary of FEMA Objectives Remaining to be met as of November 18, 1987, Grand Gulf Nuclear Station

All 39 FEMA Region VI Exercise Objectives except one have been met during the current six-year cycle. The single exception was an ARCA at this exercise that will be demonstrated at the next regular exercise.		
26.	Demonstrate ability to establish and operate rumor control in a coordinated fashion.	State (not met)

TABLE 3 FEMA Exercise Objectives Tracking Chart -- Grand Gulf Nuclear Station as of November 18, 1987

FEMA Objective Number and Description	NUREG-0654 Reference	Objective at this Exercise (Yes/No)	Jurisdictional Responsibility		Date of Exercise/ Drill	Deficiency or Area Requiring Corrective Action (By tracking Number and Date)	Date Objective Met	
			State	Local			State	Local(s)
1. Demonstrate ability to mobilize staff and activate facilities promptly (1).	E.1, E.2 (S&L)	Yes	X	X	11/17-18/ 1987		2/27/85 11/17-18/ 1987	12/3/85 11/17-18/ 1987
2. Demonstrate ability to fully staff facilities and maintain staffing around the clock (2).	A.2.a, A.4 (S&L)	Yes	X	X	11/17-18/ 1987	ARCA 87-1 11/17-18/87 State EOC	4/11/84 11/17-18/ 1987	4/11/84 11/17-18/ 1987
3. Demonstrate ability to make decisions and to coordinate emergency activities (1).	A.1.d, A.1.e, A.2.a (S&L)	Yes	X	X	11/17-18/ 1987		11/17-18/ 1987	12/3-4/85 11/17-18/ 1987
4. Demonstrate adequacy of facilities, equipment, maps and displays to support emergency operations (1).	J.10.a, J.10.b, G.3.a, H.2, H.3 (S&L)	Yes	X	X	11/17-18/ 1987		3/4/86 11/17-18/ 1987	12/3-4/85 11/17-18/ 1987
5. Demonstrate ability to communicate with all appropriate locations, organizations and field personnel (1).	F.1, F.2 (S&L)	Yes	X	X	11/17-18/ 1987	DEFICIENCY 87-1, 11/17-18/87, State EOC and LNED Office (Resolved 11/19/87)	12/3-4/85 11/17-18/ 1987	12/3-4/85 11/17-18/ 1987
6. Demonstrate ability to mobilize and deploy field monitoring teams in a timely fashion (1).	I.8 (S)	Yes	X	-			12/3-4/85 11/17-18/ 1987	N/A

TABLE 3 FEMA Exercise Objectives Tracking Chart — Grand Gulf Nuclear Station as of November 18, 1987

FEMA Objective Number and Description	NUREG-0654 Reference	Objective at this Exercise (Yes/No)	Jurisdictional Responsibility		Date of Exercise/ Drill	Deficiency or Area Requiring Corrective Action (By tracking Number and Date)	Date Objective Met	
			State	Local			State	Local(s)
7. Demonstrate appropriate equipment and procedures for determining ambient radiation levels (1).	I.8, I.11 (S)	Yes	X	-	11/17-18/ 1987		8/7/86 11/17-18/ 1987	N/A
8. Demonstrate appropriate equipment and procedures for measurement of airborne radio-iodine concentrations as low as 10^{-7} µCi/cc in the presence of noble gases (1).	I.9 (S)	Yes	X	-	11/17-18/ 1987	ARCA 87-2, 11./17-18/87, State Field Teams	8/7/86 11/17-18/ 1987	N/A
9. Demonstrate appropriate equipment and procedures for collection, transport and analysis of samples of soil, vegetation, snow, water and milk (1).	I.8 (S)	Yes	X	-	11/17-18/ 1987	ARCA 87-2, 11/17-18/87, State Field Teams	8/7/86 11/17-18/ 1987	N/A
10. Demonstrate ability to project dosage to the public via plume exposure, based on plant and field data; and to determine appropriate protective measures based on PAG's available shelter, evacuation time estimates and all other factors (1).	I.0 (S), J.10 (S&L)	Yes	X	-	11/17-18/ 1987		12/3-4/85 11/17-18/ 1987	N/A
11. Demonstrate ability to project dosage to the public via ingestion pathway exposure, based on field data; and to determine appropriate protective measured based on PAG's and other relevant factors (3).	I.10, I.11 J.10 (S)	Yes	X	-	11/17-18/ 1987		11/17-18/ 1987	N/A

TABLE 3 FEMA Exercise Objectives Tracking Chart — Grand Gulf Nuclear Station as of November 18, 1987

FEMA Objective Number and Description	NUREG-0654 Reference	Objective at this Exercise (Yes/No)	Jurisdictional Responsibility		Date of Exercise/ Drill	Deficiency or Area Requiring Corrective Action (By tracking Number and Date)	Date Objective Met	
			State	Local			State	Local(s)
12. Demonstrate ability to implement protective actions for ingestion pathway hazards (3).	J.9 (S&L) J.11 (S)	Yes	X	X	11/17-18/ 1987		11/17-18 1987	12/3-4/85 (partial) 11/17-18/ 1987
13. Demonstrate the ability to alert the public within the 10-mile EPZ and disseminate an initial instructional message within 15 minutes (1).	E.6 (S&L)	Yes	-	X	11/17-18/ 1987		N/A	12/3-4/85 11/17-18/ 1987
14. Demonstrate the ability to formulate and distribute appropriate instructions to the public in a timely fashion (1).	E.5, E.7 (S&L)	Yes	X	X	11/17-18/ 1987		1/26/83 11/17-18 1987	1/26/83 11/17-18/ 1987
15. Demonstrate organizational ability and resources necessary to manage an orderly evacuation of all or part of the plume EPZ (3).	J.9, J.10.a, J.10.g (L)	Yes	X	X	11/17-18/ 1987		12/3-4/85 11/17-18/ 1987	12/3-4/85 11/17-18/ 1987
16. Demonstrate organizational ability and resources necessary to deal with impediments to evacuation, such as inclement weather or traffic obstructions (3).	J.10.k (L)	No	-	X			N/A	1/26/83

TABLE 3 FEMA Exercise Objectives Tracking Chart — Grand Gulf Nuclear Station as of November 18, 1987

FEMA Objective Number and Description	NUREG-0654 Reference	Objective at this Exercise (Yes/No)	Jurisdictional Responsibility		Date of Exercise/ Drill	Deficiency or Area Requiring Corrective Action (By tracking Number and Date)	Date Objective Met	
			State	Local			State	Local(s)
17. Demonstrate organizational ability and resources necessary to control access to an evacuated area (3).	J.10.j (L)	No	-	X			N/A	1/26/83
18. Demonstrate organizational ability and resources necessary to effect an orderly evacuation of mobility-impaired individuals within the plume EPZ (3).	J.10.d (L)	No	-	X			N/A	11/4/81
19. Demonstrate organizational ability and resources necessary to effect an orderly evacuation of schools within the plume EPZ (3).	J.9, J.10.g (L)	No	-	X			N/A	11/4/81
20. Demonstrate ability to continuously monitor and control emergency worker exposure (1).	K.3.a, K.3.b (S&L)	Yes	X	X	11/17-18/ 1987		12/3-4/85 11/17-18/ 1987	12/3-4/85 11/17-18/ 1987
21. Demonstrate the ability to make the decision, based on predetermined criteria, whether to issue KI to emergency workers and/or the general public (3).	J.10.f (S&L)	Yes	X	-	11/17-18 1987		11/17-18 1987	N/A
22. Demonstrate the ability to supply and administer KI, once the decision has been made to do so (3).	J.10.e (S&L)	Yes	X	X	11/17-18 1987		12/3-4/85 11/17-18 1987	11/17-18/ 1987

TABLE 3 FEMA Exercise Objectives Tracking Chart — Grand Gulf Nuclear Station as of November 18, 1987

FEMA Objective Number and Description	NUREG-0654 Reference	Objective at this Exercise (Yes/No)	Jurisdictional Responsibility		Date of Exercise/ Drill	Deficiency or Area Requiring Corrective Action (By tracking Number and Date)	Date Objective Met	
			State	Local			State	Local(s)
23. Demonstrate the ability to support an orderly evacuation of on-site personnel (3 and 4).	J.2 (L)	N/A	-	-			N/A	N/A
24. Demonstrate the ability to brief the media in a clear, accurate and timely manner (3).	G.3.a, G.4.a (S&L)	Yes	X	X	11/17-18 1987		11/17-18 1987	11/17-18 1987
25. Demonstrate ability to provide advance coordination of information released (3).	G.4.b (S&L)	Yes	X	X	11/17-18 1987		11/17-18 1987	11/17-18/ 1987
26. Demonstrate ability to establish and operate rumor control in a coordinated fashion (3).	G.4.c (S&L)	Yes	X	X	11/17-18 1987	ARCA 87-3, 11/17-18/87, Media Center	Not Met 12/3-4/85 Not Observed 11/17-18 1987	11/17-18/ 1987
27. Demonstrate adequacy of procedures for registration and radiological monitoring of evacuees (1).	J.12 (S&L)	Yes	-	X	11/17-18 1987		N/A	12/3-4/85 11/17-18/ 1987
28. Demonstrate adequacy of facilities for mass care of evacuees (1).	J.10.h (L)	Yes	-	X	11/17-18 1987		N/A	1/26/81 (Tallulah) 1/26/83 (Winnsboro) 2/27/85 & 11/17-18 1987 (Ferriday)

TABLE 3 FEMA Exercise Objectives Tracking Chart — Grand Gulf Nuclear Station as of November 18, 1987

FEMA Objective Number and Description	NUREG-0654 Reference	Objective at this Exercise (Yes/No)	Jurisdictional Responsibility		Date of Exercise/ Drill	Deficiency or Area Requiring Corrective Action (By tracking Number and Date)	Date Objective Met	
			State	Local			State	Local(s)
29. Demonstrate adequate equipment and procedures for decontamination of emergency workers, equipment and vehicles (1).	K.5.a, K.5.b (L)	Yes	-	X	11/17-18/ 1987	ARCA 87-4, 11/17-18/87 Tensas Parish Monitoring & Decontamination Center	N/A	2/27/85 (Ferriday) 11/17-18/ 1987 (St. Joseph)
30. Demonstrate adequacy of EMS transportation, personnel and procedures for handling contaminated individuals, including proper decontamination of the vehicle and equipment (1).	L.4 (L and/or utility support)	Yes	-	X	11/17-18 1987		N/A	8/7/86 11/17-18/ 1987
31. Demonstrate adequacy of hospital facilities and procedures for handling contaminated persons (1).	L.1 (L and/or utility support)	N/A					N/A	N/A
32. Demonstrate ability to identify need for, request and obtain Federal assistance (1).	C.1.a, C.1.b (S)	Yes	X	-	11/17-18 1987		11/17-18 1987	N/A
33. Demonstrate ability to estimate total population exposure (3).	M.4 (S)	Yes	X	-	11/17-18/ 1987		12/3-4/85 11/17-18/ 1987	N/A
34. Demonstrate ability to determine and implement appropriate measures for controlled reentry and recovery (3).	M.1 (S&L)	Yes	X	X	11/17-18/ 1987		11/17-18/ 1987	12/3-4/85 (partial) 11/17-18/ 1987

TABLE 3 FEMA Exercise Objectives Tracking Chart — Grand Gulf Nuclear Station as of November 18, 1987

FEMA Objective Number and Description	NUREG-0654 Reference	Objective at this Exercise (Yes/No)	Jurisdictional Responsibility		Date of Exercise/ Drill	Deficiency or Area Requiring Corrective Action (By tracking Number and Date)	Date Objective Met	
			State	Local			State	Local(s)
35. Demonstrate ability to effectively call upon and utilize outside support agencies when local capabilities are exceeded (3).	C.4 (S&L)	Yes	X	-	11/17-18/ 1987		11/4/81 11/17-18/ 1987	1/26/83
36. Demonstrate the adequacy, operability and effective use of emergency communication equipment, and the adequacy of communications procedures and methods (1).	F.1 (S&L)	Yes	X	X	11/17-18 1987		12/3-4/85 11/17-18 1987	12/3-4/85 11/17-18/ 1987
37. Demonstrate the ability to monitor Emergency Classification levels continuously, and implement procedures in a timely manner (1).	D.4 (S&L)	Yes	X	X	11/17-18/ 1987		12/3-4/85 11/17-18/ 1987	12/3-4/85 11/17-18/ 1987
38. Demonstrate the capability to effectively process all incoming/outgoing messages in a timely manner, including the documentation of both actual and simulated messages (1).	E. (S&L)	Yes	X	X	11/17-18 1987		11/17-18/ 1987	12/3-4/85 11/17-18/ 1987
39. Demonstrate that authority exists in coordinating and activating a reception center (as necessary) in a timely manner (3).	A.2.a, A.3 (L)	Yes	-	X	11/17-18/ 1987		N/A	1/26/83 (Winnsboro) 2/27/85 (Ferriday) 12/2-4/85 (Tallulah) 11/17-18/ 1987 (Ferriday)

TABLE 3 FEMA Exercise Objectives Tracking Chart – Grand Gulf Nuclear Station as of November 18, 1987

(1) Objective which must be demonstrated at each full-participation exercise.

(2) Same as (1) except 24-hour staffing is required only once in each six-year exercise cycle.

(3) Objective which must be demonstrated once in each six-year exercise cycle.

(4) Initial evacuation is nuclear facility responsibility -- after leaving the site, the personnel are to be supported by the local jurisdiction as a special population.