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

DEC 18 1985

Report No.: 50-160/85-04

Licensee: Georgia Institute of Technology
225 North Avenue
Atlanta, GA 30332

Docket No.: 50-160 License No.: R-97

Facility Name: Georgia Institute of Technology

Inspection Conducted: October 28 - November 1, 1985

Inspector: for R. R. Marston 12/9/85
Date Signed

Accompanying Personnel: A. Gooden
R. T. Hogan (IE HQs)

Approved by: T. R. Decker, Section Chief 12/9/85
Date Signed
Emergency Preparedness Section
Division of Radiation Safety and Safeguards

SUMMARY

Scope: This routine, anncunced inspection involved 108 inspector-hours on site in the areas of an emergency preparedness appraisal.

Results: Of the areas inspected, no violations or deviations were identified.

TABLE OF CONTENTS

INTRODUCTION

The purpose of this appraisal was to perform a comprehensive evaluation of the licensee's emergency preparedness program. This appraisal included an evaluation of the adequacy and effectiveness of areas for which explicit regulatory requirements may not currently exist.

The appraisal scope and findings were summarized on November 1, 1985, with those persons indicated in Section 4.0 of this report.

1.0 EMERGENCY ORGANIZATION

1.1 Onsite Organization

1.1.1 Functional Areas

This area was reviewed with respect to the requirements of 10 CFR 50, Appendix E, IV.A.2, and the criteria of ANSI/ANS 15.16-1982, Section 3.3.

a. The inspector reviewed the Emergency Plan (EP) and discussed the emergency organization with licensee representatives. The inspector verified that the licensee identified the functional areas of: Director of Emergency Operations (Emergency Director), Coordinator of Emergency Preparedness (Emergency Coordinator), Public Information Liaison (Nuclear Research Center management through the University News Bureau), Radiological Assessment Coordinator (Radiological Safety Office), Individual authorized to terminate emergency and initiate recovery (Emergency Director), Individual authorized to permit reentry (Emergency Director), and Individuals authorized to permit volunteer workers to incur radiation exposure in excess of normal occupational limits (Emergency Director with concurrence of Radiological Safety Officer (RSO)). In addition, the licensee defined the specific assignments, authorities, and responsibilities in the onsite emergency organization. These identifications and definitions were found in Section 3.0 of the Emergency Plan.

No violations or deviations were identified.

b. The inspector determined through discussion with licensee representatives and review of the EP, Section 3.0, that a line of succession was provided for the following positions: Emergency Director, Public Information Liaison, and Radiological Assessment Coordinator. A line of succession was not provided for the Emergency Coordinator since the responsibilities of this position involved maintaining and updating emergency plans and implementing procedures.

No violations or deviations were identified.

c. The inspector determined through interviews with licensee personnel that all members of the onsite emergency organization had work experience appropriate to their designated emergency assignments.

No violations or deviations were identified.

d. Interviews with five members of the onsite emergency organization showed that they understood the interfaces between and among the onsite functional areas. An organization chart showing these interfaces was included in the Emergency Plan as Figure 4.

No violations or deviations were identified.

e. The Director of the Neely Nuclear Research Center (NNRC) stated that he had authority to spend certain money under emergency conditions. He also stated that he had direct access to the University's Vice President for Research and the Assistant to the President to secure additional funds.

No violations or deviations were identified.

f. The EP, Section 7.1 stated that, "The NNRC emergency organization, including offsite support, is capable of functioning around the clock in the event of prolonged emergencies." The Center Director stated that no specific plans had been made, but the staff could work shift work for the duration of the emergency.

No violations or deviations were identified.

1.1.2 Interviews and Walkthroughs

The inspector conducted interviews and walkthroughs with five members of the onsite organization. They all appeared to understand their responsibilities and authorities for their functional areas of responsibility.

No violations or deviations were identified.

1.2 Offsite Support

1.2.1 Functional Areas and Assignments

a. The EP, Sections 3.1 and 3.2, identified notification requirements and support provided by Federal, State, and local offsite agencies. Fire protection was provided by the Atlanta Fire Department, police protection was

provided by the Georgia Tech Police, and through them, the Atlanta Police Department. Ambulance and medical support was provided by Grady Hospital.

b. Federal and State emergency plans discussed support from the local agencies cited above. A letter of agreement was in effect with Grady Hospital, Police and fire protection would be provided through agreements with the Georgia Tech and Atlanta Police, and Atlanta Fire Departments, respectively.

c. The letter of agreement with Grady Hospital was dated June 6, 1984. Other support was provided under the agencies' emergency plans.

d. Licensee representatives stated that emergency training had been provided to the Atlanta Fire Department and the Georgia Tech Police. The Fire Department and Hospital/ Ambulance Service participated in appropriate drills.

No violations or deviations were identified.

1.2.2 Interviews and Walkthroughs

a. The inspector interviewed representatives of the various support groups specified in the Emergency Plan. All support groups appeared to be aware of their responsibilities. Inspection disclosed, however, that the only group which received comprehensive training regarding their duties and responsibilities was the Georgia Tech Police.

b Personnel from the various support groups were asked to evaluate the adequacy of the training received pertaining to emergencies at the NNRC. The fire support contact stated that they needed additional training. Training for medical and ambulance personnel consisted of participating in drills involving simulated contaminated injuries. Other offsite groups had not participated in drills or classroom training. The Georgia Tech Police stated that they had been provided adequate training.

See Section 3.1 of this report for an evaluation of the training program.

2.1 NOTIFICATION AND ACTIVATION OF EMERGENCY ORGANIZATION

This area was inspected with respect to the requirements of 10 CFR 50, Appendix E.IV.D, and the criteria of ANSI/ANS 15.16-1982.

2.1.1 Procedures

The inspector reviewed Sections 7.1 and 7.4 of the Emergency Plan, "Activation of the NNRC Emergency Organization," and "Reporting of Emergencies," respectively. The plan specified that the Emergency Director is responsible for initiating the emergency plan and notifying the emergency organization and offsite support personnel, as appropriate. Information to be provided to the NRC was also defined in the Plan. Detailed information on notification was provided in the Emergency Plan, Section 7.4, "Reporting of Emergencies." There were no specific notification instructions in the Emergency Procedures, however.

The following item is identified for improvement:

- Developing a procedure which describes notification methods including the following: the title of the person responsible; the agencies which must be notified for each class of emergency; the time period during which notification must be made; and the information to be provided (50-160/85-04-01).

No violations or deviations were identified.

2.1.2 Communications

The primary methods of notification consisted of a public address system (for duty hours in the Center) and telephones (for off-duty hours, and to make notifications). The emergency organization notification rosters were posted on bulletin boards throughout the building. The licensee had not checked the status of all of the emergency action telephone numbers to ensure that they were updated and correct.

The Emergency Command Center (ECC) had a telephone but not a readily available backup means of communication within the facility. Internal communication between the ECC and emergency teams would be by word of mouth. Offsite communications would be backed up by the Georgia Tech Police radios when the Georgia Tech Police respond.

Various types of alarms were used by the Georgia Tech reactor facility. The criticality alarms, low pool water level alarms, low zinc bromide level alarms in the hot cell windows, and

the fire and intrusion alarms were activated at the Georgia Tech Police Department. Procedures specified actions to be taken upon initiation of various alarms. The alarms were tested periodically to assure operability.

Based on the above findings, the following items should be considered for improvement:

- Performing quarterly updates and documentation of the emergency organization rosters should be required (50-160/85-04-02).

- Provision for backup internal communication at the ECC should be established (50-160/85-04-03).

No violations or deviations were identified.

2.2 Classification and Assessment

2.2.1 Identification and Classification

This area of the licensee's program was inspected with respect to the requirements of 10 CFR 50, Appendix E, and the criteria of ANSI/ANS 15.16-1982, Section 3.4.

2.2.1.1 Procedures

a. The inspector reviewed the EP and Emergency Procedures, and discussed this area with licensee representatives. The Emergency Procedures consisted of eight parts. Part I was a general procedure and Parts II through VIII addressed specific types of emergencies, and were primarily operational-type emergency procedures.

The "implementing" procedures were found as parts of the Emergency Plan. Sections 4.0 through 4.5 discussed and defined the emergency classification system used at the Research Center. An Operational Event was defined as a class less severe than Notification of Unusual Event. Notification of Unusual Event, Alert, and Site Area Emergency classifications were also discussed. Section 4.5 stated that a General Emergency was not a credible accident at the Center. Section 5.0 discussed Emergency Action Levels (EALs) and referenced Table I, "Emergency Classification Guide," which related the Emergency Class, Action Level, and Purpose for the classes from Operational Event

through Alert. Section 7.0, "Emergency Response," discussed activation of the emergency organization, assessment actions, and protective actions for each classification discussed in Table I.

The EALs appeared to be consistent with those in Table I, "Emergency Classes," found in ANSI/ANS 15.16-1982. EALs for thyroid doses at the site boundary were included for only the Alert classification. Licensee representatives stated that iodine releases were not considered to be a serious threat for this reactor.

The EALs in Table I were generally based on information readily available to the responsible individuals. Where practical, the EALs also related to facility parameters, effluent release levels, and equipment conditions for each emergency class.

The Emergency Procedures and Section 7.0 of the Plan discussed emergency actions for each emergency classification. Radiological surveys and media sampling were also discussed in Section 7.0 of the Plan, and specifically in the RSO's Health Physics Procedures.

The EP and Emergency Procedures also made reference to after hours emergencies. Certain emergency alarms were provided at the Georgia Tech Police headquarters.

Based on the above findings, the following Emergency Plan deficiency was identified:

> The Emergency Plan was inconsistent because a Site Area Emergency was defined in Section 4.0; however, respective EALs were not identified in Table I. Further, response to this classification was not discussed in Section 7.0 (50-160/85-04-04).
>
> Your response to the subject item will be reviewed. This finding will also be reviewed during subsequent inspections.

No violations or deviations were identified.

2.2.1.2 Equipment

Through discussions with licensee representatives, observation, and inspection of equipment, the inspector determined that the radiological and nonradiological monitors and indicators described in the Emergency Plan and Emergency Procedures were in place and operable. The equipment was described as being necessary for emergency detection and classification.

The monitors appeared to have operating characteristics capable of assessing potential accident conditions. The Kanne A Stack Monitor recorder was labeled to indicate radionuclide concentrations in the stack effluent. Other recorders had appropriate trip, alert, or alarm levels assigned.

Records were reviewed for the calendar year-to-date which showed that operability and calibration checks were performed on the equipment, and that equipment condition or status was documented. Licensee representatives stated that Technical Specifications required replacement of inoperable instruments, and repair of same.

Laboratory facilities and portable sampling and survey equipment were available for post accident sampling and analysis. A licensee representative stated that a backup laboratory was available at another Engineering Building on campus and that State Mobile Lab facilities could be used in an emergency.

No violations or deviations were identified.

2.2.2 Assessment Actions

This area was reviewed pursuant to the requirements of 10 CFR 50, Appendix E, and the criteria of ANSI/ANS 15.16-1982, Section 3.7.

The inspector reviewed the Emergency Plan, Section 7.0, the Emergency Procedures, and the Health Physics Procedures. These references described the methods, systems, and equipment for collecting and processing information and data required to define the basis for decisions to escalate or de-escalate emergency response actions. Monitoring of radiation dose rates and contamination levels were described in the Emergency Procedures and Health Physics Procedures.

Section 7.0 of the Emergency Plan and the Health Physics Procedures described monitoring at the site boundary. This section also stated that the emergency organization was capable of operating for a protracted period of time.

No violations or deviations were identified.

2.2.3 Interviews and Walkthroughs

The inspector interviewed two Radiation Safety Officers, the Reactor Supervisor, and a Senior Reactor Operator.

The individuals responsible for emergency detection, classification, and continuing assessment appeared to be familiar with the plan and procedures. During walkthroughs, the individuals were able to adequately perform emergency detection and classification.

The individuals interviewed stated that they were trained through a variety of methods including lectures, seminars, tours, and drills.

No violations or deviations were identified.

2.3 Protective/Corrective Actions

2.3.1 Facilities and Equipment

2.3.1.1 Emergency Command Center

The Emergency Command Center (ECC) was inspected against the requirements of 10 CFR 50, Appendix E, and the criteria of ANSI/ANS 15.16-1982. The ECC was discussed in Section 8.1 of the Emergency Plan. The ECC was located in the NNRC machine shop on the ground level immediately adjacent to the assembly area. It was at the farthest location from any potential source of radioactivity. A tour of this area revealed that although telephones were available in the ECC, no procedures or copy of the Plan were located in the ECC but would need to be brought by the staff. (Other problems with the ECC were discussed in section 2.1, Communications).

Based on the above findings, the following item is recommended for improvement:

- Placing copies of the Emergency Plan and Procedures in the ECC (50-160/85-04-05).

No violations or deviations were identified.

2.3.1.2 Protective Equipment

The adequacy of protective equipment was determined by a tour of the health physics office and an inventory check of the emergency supply cabinets.

The licensee maintained two emergency supply cabinets; one near the reactor airlock door and one in the ECC. Each cabinet appeared to be adequately stocked with equipment for onsite personnel and provisions were made for providing equipment, such as dosimetry and protective clothing for offsite support groups who might be required to enter a radiation or contaminated area. In addition, the Atlanta Fire Department and the Georgia Tech Police maintained radiation monitoring devices for use during an emergency.

No violations or deviations were identified.

2.3.1.3 Decontamination Capabilities

Decontamination was discussed in Section 8.4 of the Emergency Plan, "Decontamination Facilities." The inspector reviewed this portion of the plan and it appeared to be adequate.

Decontamination facilities and procedures were available throughout the laboratory and reactor buildings.

No violations or deviations were identified.

2.3.1.4 Equipment Maintenance and Calibrations

Emergency equipment and supplies were discussed in Sections 8.2 and 10.5 of the Emergency Plan. The Emergency Plan required that the emergency kits be inventoried annually. Radiation monitoring equipment was checked quarterly for operability and calibrated semiannually. Calibrations of facility air monitors were performed annually and calibrations of area radiation monitors were performed monthly.

No violations or deviations were identified.

2.3.2 Evacuation and Accountability

2.3.2.1 Evacuation

Part I of the Emergency Procedures, "General Rules and Guides for Reacting to Emergencies," discussed guidelines for an orderly evacuation of facility personnel and visitors. It discussed conditions for partial and complete evacuation during an emergency. However, evacuation routes were not clearly posted. An evacuation alarm was in place at the facility and was tested for operability periodically.

Based on the above findings, the following item should be considered for improvement:

- Posting evacuation routes with maps showing the location of the assembly area throughout the facility. Old evacuation routes should be removed (50-160/85-04-06).

No violations or deviations were identified.

2.3.2.2 Accountability

2.3.2.3 Assembly Areas

Accountability was discussed briefly in the Emergency Plan and Part I of the Emergency Procedures. The northwest corner of the parking lot, just outside the ECC was designated as the assembly area. Segregation of potentially contaminated individuals at the assembly area was discussed in Sections 7.5.4 and 7.6.4 of the Plan. The inspector reviewed this procedure and determined that there was insufficient detail of the accountability methods.

Based on the above findings, the following item should be considered for improvement:

- Including a description of accountability methods and the title of the responsible person in the procedures (50-160/85-04-07).

No violations or deviations were identified.

2.3.2.4 Personnel Monitoring

Sections 7.5.4 and 7.6.4 of the Emergency Plan briefly described the responsibility for segregating contaminated personnel following facility evacuation. Detection equipment was available at the ECC for accomplishing this responsibility. A review of the procedures describing actions to be taken after building evacuation determined that personnel monitoring was not discussed.

Based on the above findings, the following appraisal deficiency was identified:

- Develop and implement an Emergency Procedure which discusses monitoring of personnel at the assembly area and isolation and decontamination, if necessary (50-160/85-04-08).

  This item constitutes an appraisal deficiency. Your response will be reviewed. This item will also be reviewed during subsequent inspections.

No violations or deviations were identified.

2.3.3 Personnel Exposure Control

The licensee developed new emergency procedures describing protective actions to be taken by any individuals in the building during an emergency. The inspector toured the facility and discovered that outdated emergency procedures were posted on fire alarms, doors and bulletin boards.

Exposure guidelines were included in section 7.2, "Protective Action Values," which discussed emergency exposure limits for personnel in excess of 10 CFR 20 limits. Dosimetry was provided for all personnel with access to radiation areas. Extra dosimetry was available at the ECC for support personnel.

The licensee had the capability for monitoring personnel doses during emergencies; however, the procedures did not address provisions for performing this activity.

Provisions for isolation and access control were discussed in section 7.3 of the Plan. Health physics personnel were responsible for supervising isolation and access control to restricted areas to minimize exposures to radiation and to minimize the spread of radioactive contamination.

Based on the above findings, the following items are recommended for improvement:

- Removing outdated emergency procedures from doors, bulletin boards and fire alarms. Posting current directions with emergency notification rosters in appropriate locations (50-160/85-04-09).

- Developing methods and plans for keeping track of personnel dose during emergencies and making them available in the ECC (50-160/85-04-10).

No violations or deviations were identified.

2.3.4 First Aid and Rescue

First aid equipment was kept in the emergency supply cabinets, and the equipment appeared to be adequate. First aid was also covered in Section 8.3 of the Emergency Plan. Accidents resulting in personnel injury without contamination would be handled by the Georgia Tech Police who would administer first aid. In the event of an injury with contamination, the individual would be transported to Grady Memorial Hospital in Grady's Ambulance Service for treatment and decontamination.

No violations or deviations were identified.

3.0 MAINTAINING EMERGENCY PREPAREDNESS

3.1 Emergency Training and Retraining Program

The inspector reviewed this area of the licensee's program with respect to the requirements of 10 CFR 50, Appendix E, IV.F, and criteria of ANSI/ANS 15.16-1982, Section 3.10.1.

This part of the program was inspected through review of licensee records, discussion with licensee representatives, and discussion with representatives of offsite support agencies. The training/retraining was conducted through lectures and weekly seminar sessions, tours, self-study, and attendance at a Radiation Safety Short Course.

The attendance sheet for onsite training held in October 1985 showed that four members of the onsite organization did not attend the training on Emergency Procedures. In addition, there was a lack of formal documentation of the training program. No lesson plans or outlines were maintained.

Review of records and interviews with personnel showed that not all offsite support agencies were trained as stated in Section 10.1 of the Emergency Plan.

Six members of the Georgia Tech Police force were trained October 10, 1985. Previous training was conducted in August 1984.

Eight members of the Atlanta Fire Bureau's Hazardous Materials Team were trained during October 1985. The nearest and most likely first response Engine and Ladder Company was not trained, however.

No personnel from Grady Hospital (emergency room or ambulance) have been trained at the Center. Hospital representatives stated that the hospital has its own in-service training program to familiarize personnel in handling radioactive materials. Licensee representatives stated that ambulance personnel would not enter the containment area, and that Center personnel would remove a victim to a pickup point.

The inspector also noted that no formal documentation system existed for recording training and retraining of onsite and offsite personnel with emergency assignments. Refer to Section 1.2.2.b above regarding training of onsite and offsite support personnel and agencies.

The above findings and those of Section 1.2.2.b of this report are inconsistent with Section 10.1 of the Emergency Plan, and 10 CFR 50, Appendix E, Section IV.F. The referenced requirements specify training of both onsite and offsite personnel and agencies. Accordingly, the requirement is specified to include formal and practical training. The latter includes periodic drills and exercises. This finding constitutes an Appraisal Deficiency:

- Emergency response training to onsite and offsite response personnel provided for all likely emergency response personnel in accordance with requirements (50-160/85-04-11).

In addition, the following item should be considered for improvement:

- Establishing a formal documentation system for emergency organization training and retraining (50-160/85-04-12).

3.2 Drills

This area of the licensee's program was inspected pursuant to the requirements of 10 CFR 50, Appendix E, IV.F, and the criteria of ANSI/ANS 15.16-1982, Section 3.10.1.

The inspector reviewed the established drill and exercise program with licensee personnel. The most recent drill involving offsite participation was held in July 1984. This drill involved the Georgia Tech Police and the Grady Hospital ambulance and medical staff. A scenario was developed and a student observer evaluated the response. However, no documentation existed to show that a critique was held.

Licensee representatives stated that evacuation drills were held frequently to test the evacuation plan and warning systems. The Center Director and the RSO were responsible for ensuring that drills were held and for following up on corrective actions. Communication drills had not been held with the Georgia Emergency Management Agency (GEMA) or Department of Natural Resources/Environmental Protection Division (DNR/EPD).

A written scenario was available for the July 1984 drill. No comments from drill critiques were available.

Contrary to requirements that an annual drill be conducted, the licensee's approved EP was accepted with a commitment to a biennial drill.

Based on the above findings, the following Emergency Plan Deficiency was identified:

The Emergency Plan, Section 10.2 required that drills be conducted biennially rather than annually as specified 10 CFR 50, Appendix E, Section IV.F (50-160/85-04-13).

Your response to this finding will be reviewed. This item will also be reviewed during subsequent inspections.

In addition, the following item should be considered for improvement:

- Documenting drill critiques and providing for incorporation of lessons learned into plan or procedures (50-160/85-04-14).

No violations or deviations were identified.

3.3 Maintenance of Procedures and Plan

This area was inspected pursuant to the requirements of 10 CFR 50, Appendix E, IV.G, and the criteria of ANSI/ANS 15.16-1982, Section 3.10.2.

The EP, Section 10.4, described the licensee's review and update process, but no procedure was in effect. The Nuclear Safeguards Committee, the Center Director, and the RSO shared responsibility for the biennial review. There was no document control system established for plan distribution. The Center Director determined that only the Georgia Tech Police and Atlanta Emergency Management Agency required copies.

Based on the above findings, the following items should be considered for improvement:

- Developing a procedure for update and revision of the Emergency Plan (50-160/85-04-15).

- Developing a document control and distribution system for the Emergency Plan which includes dating the Plan and Procedures, and providing copies to applicable personnel and agencies (50-160/85-04-16).

4.0 PERSONS CONTACTED

Licensee Contacts

*R. A. Karam, Neely Nuclear Research Center Director
*R. M. Boyd, Radiological Safety Officer
L. D. McDowell, Reactor Supervisor
W. H. Downs, Senior Reactor Operator
S. N. Millspaugh, Deputy Radiological Safety Officer
P. Sharpe, Health Physicist

Offsite Contacts

P. Deal, Training Officer, Atlanta-Fulton County Emergency Management Agency
Lt. A. P. Miller, Fire Protection Communications, Atlanta Fire Bureau
Lt. H. C. Seales, Training Assistant, Atlanta Fire Bureau
C. P. Blackman, Environmental Specialist, Department of Natural Resource/ Environmental Protection Division
Dr. A. G. Yancey, Medical Director, Grady Memorial Hospital
Major W. W. Holly, Director of Special Operations, Atlanta Police Bureau
Chief J. Vickery, Chief of Police, Georgia Tech Police
C. Harmon, Staff, Georgia Tech News Bureau