



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

JAN 11 1990

Report No.: 50-62/89-04

Licensee: University of Virginia
 Charlottesville, VA 22901

Docket No.: 50-62

License No.: R-66

Facility Name: University of Virginia Reactor Facility

Inspection Conducted: November 29 - December 1, 1989

Inspectors:	<u>James L. Kreh</u>	<u>10 Jan. 1990</u>
	J. L. Kreh	Date Signed
	<u>C. H. Bassett</u>	<u>1/9/90</u>
	C. H. Bassett	Date Signed

Approved by:	<u>William H. Rankin</u>	<u>10 JAN 1990</u>
	W. H. Rankin, Chief	Date Signed
	Emergency Preparedness Section	
	Emergency Preparedness and Radiological	
	Protection Branch	
	Division of Radiation Safety and Safeguards	

SUMMARY

Scope:

This routine, unannounced inspection of the emergency preparedness program was conducted in the areas of emergency facilities and equipment, training, performance of drills, offsite agency support, and maintenance of the Emergency Plan and Implementing Procedures. The inspection also included observation of the licensee's annual emergency drill.

Results:

Within the areas inspected, no violations or deviations were identified. However, problems were noted and Inspector Follow-up Items were identified in the areas of: (1) personnel accountability, (2) developing a confidential drill scenario, (3) a discrepancy between the present emergency organization and that specified in an implementing procedure, and (4) a discrepancy between the Emergency Plan and an implementing procedure with respect to the designation of the Primary Assembly Area. The inspection results indicated that the licensee's emergency preparedness program had improved since the last inspection and that the licensee was maintaining an acceptable state of readiness for responding to emergencies.

REPORT DETAILS

1. Persons Contacted

Licensee Employees

- *P. Benneche, Reactor Supervisor/Supervisor of Services
- *J. Farrar, Reactor Supervisor/Reactor Administrator
- *R. Mulder, Director, University of Virginia Reactor Facility

Other Organizations

- *J. Gilchrist, Acting Radiation Safety Officer, University of Virginia (UVA) Environmental Health and Safety (EHS) Department
- *A. Jackson, Acting Reactor Health Physicist, UVA EHS Department
- *D. Steva, Acting Reactor Health Physicist, UVA EHS Department

*Attended exit interview

2. Emergency Response Drill (82745)

The licensee's Emergency Plan required that annual onsite emergency drills be conducted to test the adequacy of emergency procedures and to ensure that emergency organization personnel are familiar with their duties. In addition, at least biennially, drills must contain provisions for coordination with offsite emergency personnel for testing communications and notification procedures with offsite support groups.

On November 30, 1989, the licensee conducted the required annual emergency drill. The scenario involved a fire in a laboratory in which radioactive materials were sometimes used. The laboratory was located adjacent to the room containing an oil furnace and the primary electrical panel for the entire building. The inspector observed the response by the onsite emergency organization following "discovery" of the fire by a staff member. A public address (PA) announcement was made telling everyone of the emergency and requesting an immediate evacuation of the building. Activation and operation of the Emergency Support Center (ESC) by the Emergency Director were effective in accident investigation and mitigation. At the scene of the fire, the Emergency Coordinator directed staff personnel in efforts to extinguish the fire. The campus Police Department, the Charlottesville Fire Department, and the Environmental Health and Safety Department were contacted and requests for support were made. Each responded as requested with the police arriving first and controlling entrance to the site. The Health Physics personnel arrived shortly thereafter and began air sampling and radiation and contamination surveys. The Fire Department arrived about twenty minutes into the drill but this had been anticipated due to the "other-than-an-actual-emergency" response specified by that agency's procedures. The simulated fire had been extinguished by the time the Fire Department arrived.

Two problems were noted by the inspector which were subsequently discussed with the licensee. Personnel accountability was not conducted immediately after the building evacuation but was performed after about an hour had passed. This item will be tracked by the NRC as an Inspector Follow-up Item (IFI) and will be reviewed during a subsequent inspection.

IFI 50-62/89-04-01: Performing Accountability Immediately Following an Emergency.

The other problem noted was that the drill scenario had been developed by persons participating in the drill. The Emergency Director helped develop the scenario and was cognizant of the nature and extent of the problems that would be encountered during the drill. The licensee was informed that conducting an exercise in which the scenario details were known to key participants did not appear to provide a true test of the adequacy of timing (mobilizing personnel, event classification, and notification of outside agencies), plan implementation, and assurance that personnel are familiar with their roles and responsibilities. In order to fully test the emergency program and implementing procedures, the exercise players should not have advance knowledge of the scenario details. This item will also be tracked by the NRC as an IFI and will be reviewed during a subsequent inspection.

IFI 50-62/89-04-02: Conducting the Annual Emergency Drill in a Manner That Fully Tests Implementation of the Emergency Plan.

3. Emergency Organization (82745)

Pursuant to Sections IV.A and IV.F of Appendix E to 10 CFR Part 50, this area was inspected to determine if the licensee had defined the key functional areas of the onsite and offsite emergency organizations, and assigned trained personnel to all functional areas of the onsite organization.

The inspector reviewed Section 3.0 of the Emergency Plan for a description of the emergency organization. Based on this review and observations made during the emergency drill, the inspector determined that the licensee had defined the key functional areas for the onsite emergency organization, and that, in general, staff and management personnel were aware of their responsibilities during an emergency. An emergency organization chart was available in Emergency Plan Implementing Procedure (EPIP)-1, Emergency Director Controlling Procedure, Attachment 2, which depicted the various onsite positions and offsite interfaces. However, the inspector noted that Attachment 2 indicated that the Emergency Communicator position described therein was to be filled by a reactor operator as designated by the Emergency Director. Observation of the personnel working in the ESC during the drill revealed that, in actual practice, office personnel were used to perform the communications duties. This difference between the EPIP and actual practice was discussed with the licensee and will be followed by the NRC as an IFI.

IFI 50-62/89-04-03: Determining Who Will Fill the Position of Emergency Communicator During an Emergency and Changing EPIP-1 or Actual Practice to Reflect This.

4. Emergency Response Training (82745)

Section 10.1 of the Emergency Plan described the training program for reactor facility personnel. The training for these individuals was to include at least two classroom training sessions and practical drills yearly.

The inspector reviewed the training records for the period from July 1988 through November 1989 and discussed emergency training provided to management and staff personnel. Through review of the records and discussions with licensee personnel, the inspector determined that a previous problem dealing with a failure to train certain reactor personnel had been corrected. The records indicated that the required training and practical drills had been conducted at the required frequency. The inspector also verified that more than one staff member at the facility was trained in first aid measures. This had been a commitment made by the licensee during a previous inspection.

5. Emergency Drills and Exercises (82745)

The inspector reviewed the licensee's program for performing periodic drills and exercises to test the implementation of the Emergency Plan and the EIPs. This program, as established by the licensee, was to include the performance of an annual onsite drill, a biennial drill involving coordination with offsite agencies, and semiannual evacuation drills.

Through review of the licensee's documentation and discussions with licensee personnel, the inspector determined that the drills were being conducted in compliance with the requirements of the program. The annual drills and evacuation drills were being conducted and the drill involving support from offsite agencies had been completed. The next drill of that type was scheduled for the fall of 1990.

6. Maintenance of Emergency Plan and Implementing Procedures (82745)

The Emergency Plan and EIPs were selectively reviewed to note changes made since the last inspection and determine whether these changes had adversely affected the overall state of emergency preparedness at the facility. The revisions were primarily administrative in nature and the inspector determined that they did not decrease the effectiveness of the Plan.

During this review, the inspector noted a discrepancy between the Emergency Plan and EPIP-14, Evacuation of On-Site Areas. Section 7.5(1) of the Emergency Plan stated that "the Primary Assembly Area is located just outside the gate in the exclusion fence at the entrance to the Reactor Facility," a location east of the facility building.

Section 8.4(1)(c) stated that the automatic response to this alarm (evacuation alarm) by persons inside the building (the reactor facility) was to evacuate the building by the nearest exit and to gather at the Primary Assembly Area. EPIP-14 stated in Section 3.f that, following an evacuation alarm, "personnel should assemble at the west end of the Reactor Facility Building (Primary Assembly Area)." These discrepant designations of the Primary Assembly Area were discussed with licensee representatives, and they agreed to check the references and correct the items that might need to be changed in order to designate only one area as the Primary Assembly Area. This item will be tracked by the NRC as an IFI and will be reviewed during a future inspection.

IFI 50-62/89-04-04: Correcting the inconsistency between the Emergency Plan and EPIP-14 concerning the designation of a Primary Assembly Area.

Submittal of changes to the NRC was also evaluated, as well as distribution of changes to appropriate onsite personnel and offsite agencies. Review of licensee documentation showed that Revisions 10 and 11 of the EIPs were transmitted to the NRC within 30 days as required. Also, examination of several copies of the Plan and Procedures indicated that the revisions were being distributed as appropriate.

7. Emergency Facilities and Equipment (82745)

The inspector selectively examined emergency kits and equipment at various locations in the facility. The two formal kits, located on the first or main floor and on the ground floor, included radiation survey meters, dosimetry, protective clothing, first aid supplies, Self-Contained Breathing Apparatus (SCBAs), and Health Physics (HP) signs and barriers. The equipment examined (survey meters and dosimeters) had been calibrated as required and the other supplies appeared adequate to combat a radiological emergency.

The inspector also reviewed the program for maintaining the emergency equipment and for keeping the proper inventory of items in the kits. The licensee's documentation indicated that the emergency kits were inventoried and maintained as required by Section 8.6 of the Emergency Plan.

8. Action on Previous Inspection Findings (92701, 92702)

- a. (Closed) Violation (VIO) 50-62/88-02-01: Failure to provide emergency response training in accordance with Section 10.1 of the Emergency Plan.

The inspector reviewed the licensee's response dated October 13, 1988, and verified that the corrective actions outlined therein had been taken. The training records for the period from July 1, 1988 through June 30, 1989 were reviewed as was the licensee's two-year schedule/matrix of training activities. Various lesson plans for

emergency training were reviewed as well. All material reviewed was adequate.

- b. (Closed) IFI 50-62/88-02-02: Commitment to maintain more than one staff member trained in first aid measures.

The licensee indicated that all reactor staff members were trained in Red Cross first aid during February-March 1989. Thus, five senior reactor operators, one reactor operator, and the Facility Director have received the first aid training. This training was considered to fulfill the classroom training requirement for March 1989.

- c. (Closed) IFI 50-62/88-02-03: Upgrade the annual drill scope to include an integrated response by the entire emergency organization.

The annual drill held January 17, 1989 (which had been delayed from December 1988) required participation from various support organizations. The local rescue squad had been scheduled to participate but they could not due to their work load. (The rescue squad is a volunteer organization and scheduling the drill to accommodate everyone's schedule could not be worked out.) However, the drill was conducted and documented in the required manner and a critique was held. The current drill, held November 30, 1989, required an integrated response as well. It demonstrated that the organizations that have agreed to support the reactor facility were capable of doing so and could respond as required.

- d. (Closed) VIO 50-62/88-02-04: Failure to perform semiannual evacuation drills in accordance with the Plan requirements.

The licensee's response, dated October 13, 1988, was reviewed and implementation of the corrective actions verified. The licensee's records indicated that semiannual drills were being performed in conjunction with the test of the building evacuation alarm. Evacuation drills were conducted on November 2, 1988; April 14, 1989; and October 27, 1989.

- e. (Open) VIO 50-62/88-02-05: Failure to update Letters of Agreement in accordance with the Plan requirements.

Letters soliciting updated Letters of Agreement were sent out November 8, 1989, but not to the Virginia Department of Emergency Services nor to Oak Ridge/Department of Energy as specified in the Emergency Plan. Even though standing/permanent Letters of Agreement dated 1985 with those two organizations were on file, the current wording in the Plan required an annual update of all Letters of Agreement.

9. Exit Interview

The inspection scope and results were summarized on December 1, 1989, with those persons indicated in Paragraph 1. The inspector described the areas inspected and discussed in detail the inspection results listed below. Licensee management agreed to consider the four IFIs for potential enhancement of their emergency preparedness program. The licensee did not identify as proprietary any of the material provided to or reviewed by the inspector. Dissenting comments were not received from the licensee. However, the licensee did indicate that it would be difficult, considering the current staffing level at the facility, to develop a drill scenario with only one member of the staff cognizant of and involved in that task so as to preserve scenario confidentiality.

<u>Item Number</u>	<u>Description and Discussion</u>
50-62/89-04-01	IFI - Performing accountability immediately following an emergency (Paragraph 2).
50-62/89-04-02	IFI - Conducting the annual emergency drill in a manner that fully tests implementation of the Emergency Plan and proper response by participants (Paragraph 2).
50-62/89-04-03	IFI - Determining who will fill the position of emergency communicator during an emergency and changing the EPIP or actual practice as needed to reflect this (Paragraph 3).
50-62/89-04-04	IFI - Correcting the inconsistency between the Emergency Plan and EPIP-14 with regard to designation of the "Primary Assembly Area" (Paragraph 6).

Licensee management was informed that five previous findings were reviewed and, as discussed in Paragraph 8, four were considered closed.

Attachment:
Drill Objectives and Scenario

DEPARTMENT OF NUCLEAR ENGINEERING AND ENGINEERING PHYSICS
UNIVERSITY OF VIRGINIA
REACTOR FACILITY

MEMORANDUM

November 28, 1989

To: Emergency Procedures Training File
From: Paul Benneche (4-7136), Drill Conductor
Subject: Drill Scenario For November 30, 1989 Emergency Drill

- Objectives of Drill:
- To accomplish practical emergency personnel training. This includes some classroom type training in pre-drill and post-drill discussions.
 - To involve off-site agency support personnel.
 - To simulate proper radiological assessments during an accident situation.
 - To evacuate non-essential personnel from "affected area".
 - To test communication links with off-site support organizations, local and state authorities and regulatory agencies.
 - To develop and maintain appropriate records.
 - To encourage feedback from drill participants in order to improve emergency response and for consideration of appropriate Emergency Plan or EPIP modifications.
 - To fulfill Emergency Plan drill requirements.

General Scenario: A member of the Reactor Staff, when completing a pre-operation checklist, discovers thick smoke in the rooms M019 and M020 on the mezzanine level of the building. Apparently, an item with combustible fumes was placed in the oven in room M019 subsequently causing a fire. Room M020 contains the oil furnace and primary electrical panel for the building while M019 is a laboratory in which radioactive materials are sometimes used. After Unusual Event has been declared and as local firefighting efforts begin, an explosion is postulated.

Expected Emergency Level: Up to Alert, due to the fact that an explosion is postulated to occur which supposedly affects facility operation due to the subsequent fire near the electrical panel which supplies power to the building.

Expected Participants: Reactor Staff, Environmental Health and Safety (HP)
Staff, Charlottesville Fire Department, UVA Police, Va.
Office of Emergency Services (Charlottesville Office).

Pre-Drill Preparation: Conduct emergency requalification training with reactor
staff as normally scheduled.

Renew letters of commitment with off-site support
organizations.

Offer to give training to off-site support organizations
in the form of tours of the reactor facility and
discussions of possible emergencies which might occur.

Distribute updated emergency actions lists and emergency
phone numbers to appropriate off-site organizations.

Post-Drill Actions: Follow-up critique of drill.
Update EPIP's and EP as required.
Submit revisions to RSC in early 1990.

Additional Details:

Smoke is discovered by a staff member and is thick enough to mask the
location of its source. It is therefore unclear whether the fire is burning or
has gone out on its own or if the smoke is due to smoldering material. For the
purposes of the drill the drill conductor will tell the staff members that a
small fire is currently involved near the back of the laboratory such that its
specific location is obscured.

The specific incident which will be projected to occur after the initial
discovery of smoke is an explosion and fire near the oven in the back left
corner of the room. The fire will spread to the wooden wall separating the two
rooms. This accounts for the smoke in both rooms. The oven will still be
burning and the wall will be smoldering badly, near the point of combustion.
The smoke will be projected to be thick enough to require respiratory
protection to enter either room.

It should be clear that it will take more than 10 minutes to don respiratory
gear and protective clothing to fight the fire so the fire department should be
summoned. Whether or not there is an attempt to control the fire by the
reactor staff will be dependant on how long it takes for the fire department to
reach the scene. However, the on-site staff should prepare to fight the fire
if time permits. Respiratory gear is called for assessment and to check for
potential victims in room.

Because radioactive materials are used in the laboratory, the possibility of
radioactive contamination on any personnel entering the room will need to be
considered. Appropriate step down areas with the necessary frisking equipment
will need to be set up to monitor all personnel leaving the room until it is
determined that there is no contamination. For the purpose of the drill it
will be assumed that low level contamination is found on the shoes of
individuals exiting the laboratory (M020). This contamination will be minor in
nature and will be projected to be easily removed from rubber boots or shoe
covers with prescribed decontamination procedures.

Due to the fires unknown source, its isolated location and the proximity of the electrical panel the fire personnel and staff will have to decide the best of several possible methods to fight it. The low level contamination present will also be a factor in the decision making process.

At no time during the drill should any equipment be damaged for the sole purpose of making the drill realistic, i.e. no spraying of water or fire extinguishers, no breaking down of doors or locks, etc.

The "drill conductor" will unfold the scenario to the personnel in the "affected" area. He will also be an observer of the emergency actions and will participate in channeling communications to the Emergency Director.