


UFTR OPERATING PROCEDURE B.1

1.0 Radiological Emergency

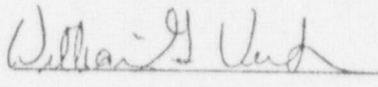
2.0 Approval

Reactor Safety Review Subcommittee



1/17/95
Date

Facility Director



1/19/95
Date

3.0 Purpose and Discussion

- 3.1 This procedure delineates a chain of responsibility and outlines specific and generic actions to be taken by all personnel in the event of a radiological emergency requiring evacuation of the UFTR Cell and other parts of the Reactor Building.
- 3.2 Basic knowledge and understanding of this procedure is required for someone to be qualified as a second person for reactor operation. Documented certification of this qualification requires completion of UFTR Form SOP-B.1A (Emergency Procedure Qualification) contained in Appendix II of this procedure.

4.0 Limits and Precautions

- 4.1 All limits and precautions for radiation protection and control in UFTR SOP-D.1 are to be observed.
- 4.2 The University of Florida Radiation Control Guide should be used for control of radiation and contamination limits.

CAUTION

When the stack count rate monitor indicates 10 cps or higher, the diluting and/or vent fans shall not be secured except for one of the conditions delineated in Items 4.3.1 through 4.3.5.

- 4.3 If the stack count rate monitor indicates 10 cps or greater during routine shutdown conditions, the vent and/or diluting fans may be secured only for one of the following facility conditions to include:
 - 4.3.1 Loss of building electrical power,
 - 4.3.2 Equipment failure,
 - 4.3.3 Cycling console power to dump primary coolant,
 - 4.3.4 Performance of tests and surveillances,
 - 4.3.5 Initiation of the evacuation alarm for tests and surveillances including emergency drills.

Note: If the stack count rate monitor indicates 10 cps or higher, the time these fans are secured for these reasons should be minimized.

- 4.4 Prior to initiation of venting of the UFTR cell to reduce the concentration of airborne radioactive materials, the cell atmosphere shall be sampled and the radionuclide concentration verified to be within limits for release to unrestricted areas with the usual dilution credits allowed.
- 4.5 All emergency response actions should be in accordance with the approved UFTR Emergency Plan and should be implemented to assure resulting dose commitments are as low as reasonably achievable (ALARA).
- 4.6 All personnel reentering the Reactor Building in response to radiological emergencies should wear proper dosimetry to include a film badge and two self-reading pocket dosimeters (one high level, one low level). Each reentry team should carry an appropriate survey meter; depending on circumstances, a high range meter such as a teletector should also be carried to assure monitoring with minimal dose commitment.
- 4.7 Personnel reaching the Emergency Support Center following a radiological incident should check the radiation level to determine if evacuation of the Nuclear Sciences Center is indicated (dose rate \geq 10 mR/hr).
- 4.8 Evacuees to the west reactor lot should assemble near the NSC equipment room away from the reactor cell west freight door.
- 4.9 Proper notifications are to be made as soon as practicable during radiological emergencies without negatively impacting effective response. Required notification should include the University Police Department, the University of Florida Radiation Control Office, the State Warning Point, the County Warning Point, the State of Florida Bureau of Radiation Control, and the University Information Office. For Emergency Drills the latter four notifications may be made prior to the Drill. Other notifications of outside agencies such as Ambulance Service and Gainesville Fire Department should be made through the University Police Department. Shands Hospital may be contacted via the University Police Department and then confirmed directly.
- 4.10 The evacuation siren is actuated in one of two ways, either automatically or manually.

Note: An automatic actuation of the evacuation alarm results in a tilting siren while a manual actuation results in a steady siren.

5.0 References

5.1 UFTR Emergency Plan

REV 5, 1/95
TCN: 5/95
TCN: 1/97
TCN: 8/97

5.2 University of Florida Radiation Control Guide

5.3 UFTR SOP-D.1, "Radiation Protection and Control"

6.0 Records required

6.1 UFTR Form SOP-B.1A, "Emergency Procedure Qualification"

6.2 Written Reports of Quarterly Emergency Drills per Surveillance Date Sheet in UFTR SOP-0.5 (Q-3 Surveillance)

6.3 Written Reports of Actual Emergencies

7.0 Instructions

7.1 During working hours

7.1.1 Immediate actions

Note: For this procedure, working hours are defined as any time that authorized personnel are in the Reactor Cell.

7.1.1.1 Upon hearing the evacuation siren, all personnel in the Reactor Building shall evacuate the Reactor Building. The Reactor Building shall be defined as including the Reactor Cell and Control Room, the Annex (upstairs and downstairs) and the upper level and lower level of the Reactor Building.

7.1.1.1.1 If in the Reactor Cell, evacuate the cell and unless exit is made via the personnel emergency exit in the freight door, proceed directly to the Emergency Support Center (Room 108 NSC).

7.1.1.1.2 If in the staff offices, the electronics shop, the downstairs bathroom or the downstairs hallway, proceed directly to the Emergency Support Center (Room 108 NSC).

7.1.1.1.3 If in the upper level of the Reactor Building, the upper floor of the Annex Building, or the lower level of the Materials Science side of the Annex, personnel should evacuate and assemble in front of the Annex on the East side of the building.

7.1.1.1.4 If in the Radiochemistry Lab or the lower floor of the reactor side of the Annex building, or if exit is made from the cell via the personnel emergency exit in the freight door, personnel are to evacuate to the west lot and assemble in the security area behind the Reactor Building close to the NSC air conditioning equipment room.

- 7.1.1.1.5 Personnel assembling at either of these two locations away from the Emergency Support Center should wait to be checked by a representative of the Radiation Control Department and given further instructions.

Note: Licensed personnel as well as radiation control qualified reactor personnel who are located so they would normally be directed to evacuate to locations away from the Emergency Support Center when the evacuation siren actuates may proceed directly to Room 108 NSC by the most direct route that will limit their likelihood of becoming contaminated and the likelihood of their spreading contamination offsite while assuring a sufficient response to the Emergency Support Center. Such personnel may elect to have other personnel accompany them to the Emergency Support Center to facilitate emergency response.

- 7.1.1.2 The evacuation siren is actuated in one of two ways, either automatically or manually.

Note: An automatic actuation of the evacuation alarm results in a lilting siren while a manual actuation results in a steady siren.

- 7.1.1.2.1 The evacuation siren will actuate automatically upon a 2-out-of-3 coincidence with the North, South and/or East area monitors in the reactor cell reading 10 mR/hr or higher. If such a condition exists and the siren does not actuate automatically, manually actuate the siren.

- 7.1.1.2.2 If the Air Particulate Detector (APD) alarms, unless it is positively known that this is not a valid alarm condition, all persons shall immediately evacuate the cell and proceed as per this procedure. The reactor operator will actuate the siren manually prior to exiting the cell.

Note: At any time that events so indicate, the reactor operator in charge may actuate the evacuation alarm to assure rapid and controlled facility evacuation in response to an unsafe radiological or other condition.

- 7.1.1.3 If a radiological incident has occurred in the reactor involving evacuation to the Emergency Support Center, personnel reaching the Emergency Support Center should check the radiation level to determine if evacuation of the Nuclear Sciences Center is indicated. If the radiation level is larger than 10 mRem/hr in the hallway, dial Campus Police (2-1111), inform them "Emergency in the Reactor" and have them direct evacuation of the Nuclear Sciences Center immediately.

- 7.1.1.4 The connecting doors to the Nuclear Sciences Center will be closed and all external building doors will be checked, closed and locked and then secured with the special security bolts except the downstairs door leading to Room 108 NSC since this is the normal reentry route and is adjacent to the Emergency Support Center.
- 7.1.1.5 The first responsibility of the senior person on site will be to obtain medical aid for any injured personnel. When evacuation from the reactor cell is required due to a radiological emergency or fire, the reactor operator or senior experimenter will assure that all personnel have evacuated (unless not feasible due to the emergency). Every effort will be made to safely evacuate incapacitated personnel by supplying physical assistance.
- 7.1.1.6 Personnel responsibilities

Note: Licensed reactor operators have seniority in all reactor-related matters. The Facility Director will direct and the Reactor Manager will coordinate any supplemental actions.

If a reactor operator is not present, start implementing "Instructions for Radiological Emergency" (Appendix I) posted in the Emergency Support Center (Room 108 NSC). In particular, make the required telephone calls immediately. Make a log of all calls made, all pertinent information known or available and all actions taken.

- 7.1.1.6.1 Reactor Operator shall perform the following immediate actions:
- 7.1.1.6.1.1 Insure the reactor is shut down by any appropriate method, and remove and take custody of the control console key, check the area radiation monitors and stack monitor for abnormal conditions. Check that the air handler system is off.
- 7.1.1.6.1.2 If possible, assess the overall plant status to include consideration of any injured personnel and collect portable survey meters for use at the Emergency Support Center.
- 7.1.1.6.1.3 If possible, insure that all personnel in the cell have evacuated to the Emergency Support Center. Take notice if anyone evacuated through the reactor cell freight door emergency exit. Notify the Senior Reactor Operator-On-Call, the Radiation Control Officer, and the Reactor Manager from the telephone in Room 108.
- 7.1.1.6.1.4 If possible, start implementing Appendix I, "Instructions for Radiological Emergencies" posted in Room 108 NSC.

- 7.1.1.6.1.5 Assume the responsibilities of the Senior Reactor Operator if absent.
- 7.1.1.6.2 Senior Reactor Operator on duty shall perform the following actions:
 - 7.1.1.6.2.1 Check with the reactor operator in the Emergency Support Center to assure that the reactor has been shut down and secured.
 - 7.1.1.6.2.2 Check with those evacuated from the reactor cell to ascertain who or what initiated the evacuation siren and the current status of the reactor and the cell as far as they are known.
 - 7.1.1.6.2.3 Contact the Reactor Manager and the Radiation Control Officer or their alternates.
 - 7.1.1.6.2.4 Assume the responsibilities of the Reactor Manager if absent and if conditions require.
- 7.1.1.6.3 Reactor Manager shall perform the following:
 - 7.1.1.6.3.1 Immediate Actions
 - 7.1.1.6.3.1.1 Coordinate all actions pertaining to the emergency; that is, act as the Emergency Coordinator per the Emergency Plan.
 - 7.1.1.6.3.1.2 Assess the situation from preliminary reports and proceed to the Emergency Support Center.
 - 7.1.1.6.3.1.3 The Reactor Manager will assure that proper communications are made concerning radiological emergencies including contact of outside agencies to include the University Police Department, the University of Florida Radiation Control Office, the State Warning Point, the County Warning Point, the State of Florida Bureau of Radiation Control, and the University Information Office. Other outside agencies are contacted through the University Police Department.
 - 7.1.1.6.3.1.4 Coordinate selection and instruction of a two person (normal number assuming sufficient personnel available) team to reenter the UFTR Building through the first floor door connecting the UFTR and NSC Buildings.
 - 7.1.1.6.3.1.4 Insure emergency equipment is properly employed including protective clothing and respiratory devices as deemed necessary. Assure those reentering the building wear two pocket dosimeters, one low range and one high range, and carry a survey meter (low and/or high range).

7.1.1.6.3.2 Supplemental Actions

- 7.1.1.6.3.2.1 If advisable, enter the UFTR building with the Radiation Control Officer (RCO) or the RCO's representative through the first floor door connecting the UFTR and the NSC buildings. Take preliminary radiation level readings. If the radiation levels allow, proceed to the Reactor Control Room door. Observe the area radiation monitor readings and reactor console instrumentation indications through the control room door observation window as far as possible.

Note: The two person reentry team should carry a two-way radio to maintain communications with those at the Emergency Support Center.

- 7.1.1.6.3.2.2 Determine the cause of the alarm, if possible. Enter the reactor cell, or take appropriate actions to safeguard the safety of the public and remove injured personnel.

Note: These actions will normally involve assuring proper building evacuation and proper securing of the building entrances using the special security locks.

- 7.1.1.6.3.2.3 Coordinate all emergency actions with Radiation Control and aid in deciding whether the Shands Hospital Emergency Department Plan for Emergency Handling of Radiological Accident Cases and/or the State of Florida Bureau of Radiation Control in the Department of Health Standard Operating Procedures for Radiological Emergencies should be implemented.

- 7.1.1.6.3.2.4 Notify the evacuated personnel when it is safe to reenter the building.

7.1.1.6.4 Facility Director shall perform the following:

- 7.1.1.6.4.1 Direct all actions related to the emergency; that is, act as the Emergency Director per the Emergency Plan;

- 7.1.1.6.4.2 Assure that proper notifications are made.

7.1.1.6.5 Radiation Control Officer or alternate shall perform the following:

7.1.1.6.5.1 Immediate Actions

- 7.1.1.6.5.1.1 Safeguard the health and safety of the public and of the personnel involved in all actions pertaining to the radiological emergency.

Radiation Control shall have veto power over actions pertaining to events and incidents which are part of the radiological emergency condition; that is, for dose commitment and radiation control related activities.

7.1.1.6.5.1.2 Upon notification, immediately proceed to the Emergency Support Center from the Nuclear Sciences Center.

7.1.1.6.5.1.3 Check or instruct another radiation control staff member to check the personnel situation, including those who exited through the freight door emergency exit of the reactor cell or other exit into the west lot and those who might have assembled on the East Side of the Reactor Building.

Note: This individual or these individuals should also be instructed in implementing and then checking that all external building doors are closed, locked and secured with the special security locks.

7.1.1.6.5.2 Supplemental actions:

7.1.1.6.5.2.1 Enter the UFTR Building with the Reactor manager or his representative and determine the nature and extent of any radiation or contamination hazard. Aid in coordinating entries to the Reactor Cell. Assure those reentering the building wear appropriate clothing and respiratory devices, two pocket dosimeters (one high and one low range) and carry a radiation survey meter (low and/or high range).

7.1.1.6.5.2.2 Supervise any decontamination of the area, equipment and personnel. Insure that all personnel involved in any clean-up operation are properly clothed and protected for the operation.

7.1.1.6.5.2.3 When necessary, direct and assist in the arrangement of any emergency shielding or other control and assessment measures.

7.1.1.6.5.2.4 Coordinate all emergency actions with the Reactor Manager and aid in deciding whether the Shands Hospital Emergency Department Plan for Emergency Handling of Radiological Accident Cases and/or the Official State Plan for Radiological Emergencies in Florida should be implemented. If a Reactor Operator is present, follow the operator's instructions.

7.1.2 If the incident involves evacuation of off-site personnel, bodily injury or damage to off-site property, American Nuclear Insurers shall be notified per the posted Call List.

7.2 During non-working hours

7.2.1 Immediate Actions

- 7.2.1.1 Personnel responding to a notification of any abnormal noise or condition in the reactor cell shall first proceed to the Emergency Support Center via the Nuclear Sciences Center. Upon arrival, evaluate the situation from the best information available.
- 7.2.1.2 If there is any indication of radiological involvement, begin implementation of UFTR.SOP-B.1, "Radiological Emergency."
- 7.2.1.3 If there are no indications of radiological involvement, proceed cautiously to the reactor control room with a low range survey instrument. If no radiological involvement is confirmed, further evaluate the situation and take appropriate actions.

7.2.2 Supplemental Actions

- 7.2.2.1 If personnel response involves limited numbers, then special consideration should be given to evaluating and addressing the Emergency in a quick manner with responding personnel while further support is requested as necessary.

APPENDIX I

INSTRUCTIONS FOR
RADIOLOGICAL EMERGENCIES

INSTRUCTIONS FOR RADIOLOGICAL EMERGENCIES

1. Call in order:

a. University Police Department

b. Reactor Manager:

1) Dial number for his known location

2) Dial Shands paging service at:

On Campus 5-33

Off Campus 395-0120

Enter: Pager #3564 Function Code 7

Then enter the number to be displayed on the pager.

3) See posted call list for home telephone numbers and alternates.

c. Radiation Control Officer:

1) Dial 2-7359 for the RCO's office

2) See posted call list for home telephone numbers and alternates.

d. State Warning Point

e. County Warning Point

f. State of Florida Department of Health, Bureau of Radiation Control

g. University Information Office

Note: For emergency drills, any of these entities may be contacted prior to the emergency exercise.

2. Check radiation levels in the hallway outside Room 108 NSC. For levels greater than 10 mR/hr, evacuate the Nuclear Sciences Center.

REV 5, 1/95

TCN: 12/95

TCN: 1/97

3. Check personnel for gross contamination.
4. Set up a control area outside Room 108 NSC.
 - a. Use absorbent paper.
 - b. Position a barrier to define the area.
 - c. Place the emergency equipment cart near the control point.
5. The senior person in the Emergency Support Center will be responsible for recording main events and personnel involved (names and contamination levels), including the chronology of events.
6. Supplemental actions for REACTOR OPERATORS AND OTHER QUALIFIED PERSONNEL ONLY
 - a. When deemed advisable by the senior person in charge, the following switches on lighting panel 1 in the UFTR operating staff room may be opened for the following effects:
 - 1) Switch D in the Auxiliary Panel deactivates UFTR siren.
 - 2) Breaker No. 19 in the main panel deactivates Annex siren.
 - 3) Breaker No. 25 in the main panel shuts off the air conditioner if the automatic system trip did not function.
 - b. Securing Breaker No. 9 on the main AC Distribution Panel in the NW corner of the radiochemistry Lab will trip the reactor (if this has not been done) and will also shut off all equipment including the Diluting Fan and Core Vent Fan. This action will also cause the Radiation Monitors to operate on their battery packs alone. Resetting this breaker will restart all equipment, but will leave the reactor in a tripped condition.

APPENDIX II

UFTR Form SOP-B.1A
"Emergency Procedure Qualification"

UFTR Form SOP-B.1A

EMERGENCY PROCEDURE QUALIFICATION

To the attention of the Reactor Manager:

In accordance with the requirements set forth in the Standard Operating Procedures and Technical Specifications regulating the safe operation of the UFTR, I have read SOP-B.1, "Radiological Emergency" and SOP-B.2, "Emergency Procedure - Fire" and fully understand my responsibilities as a "second person."

Name: _____

Date: _____

Signed: _____

As a qualified and certified Reactor Operator, I certify that the above named individual has received the necessary lecture and practical training as well as demonstrated the understanding of UFTR SOP-B. 1, "Radiological Emergency" and UFTR SOP-B.2, "Emergency Procedure - Fire" required to serve as a qualified second person for running the UFTR.

Basis for Certification:

Quiz Grade: _____

Retraining: _____

Signed: _____ Date _____
(Certified Reactor Operator)