UNIVERSITY OF FLORIDA TRAINING REACTOR
RESPIRATORY PROTECTION PROGRAM

I. OBJECTIVE

The Division of Environmental Health and Safety (EH&S) administers a Respiratory Protection Program as part of its mission to maintain employee health and safety at the University of Florida. This program satisfies the requirements of the Occupational Safety and Health Administration (OSHA) Respiratory Protection Standard, 29 CFR 1910.134. The objective of the University of Florida Training Reactor Respiratory Protection Program is to provide additional guidance and meet requirements as outlined in 10 CFR 20 (Standards for Protection Against Radiation), Subpart H (Respiratory Protection and Controls to Restrict Internal Exposure In Restricted Areas), Sections 20.1701 through 20.1703.

II. POLICY

This program impacts personnel who are required, or elect, to wear respiratory protection as part of their employment at the University of Florida Training Reactor. The facility, to the extent practical, shall utilize process or engineering controls to control the concentrations of radioactive material in the air to preclude the need for respiratory protection. When it is not practical to apply process or other engineering controls to control the concentrations of radioactive material in air to values below those that define an airborne radioactivity area, the UFTR shall, consistent with maintaining the total effective dose equivalent ALARA, increase monitoring and limit intakes by one or more of the following means:

- Control of Access
- Limitation of Exposure Times
- Use of Respiratory Protection Equipment
- Other Controls

Additionally the use of respirators shall be authorized for use during times when concentrations of radionuclides are below those that define an airborne radioactivity area, but in sufficient concentration to warrant respirator use to ensure total effective dose equivalent remains ALARA. Respirator use is encouraged, even when exposures are below the exposure limit, to provide an additional level of comfort and protection for workers.

Where not specifically addressed by this program, the University of Florida Respiratory Protection Program shall be followed.

REV 2, 7/98

Contents of the Program include the following:

- Responsibilities
- Work Area Surveillance
- Applicability
- Medical Evaluation
- Training
- Respirator Selection
- Issue, Fit Checks, Inspection and Maintenance
- 3M 6000 Half Mask Procedure for Use
- MSA Model 401 SCBA Procedure for Use
- Emergency Preparedness
- References
- Approval

III. RESPONSIBILITY

The UFTR Reactor Manager is responsible for the administration of this program. If respiratory protection is determined to be necessary, the Respirator Coordinator at EH&S will conduct initial training and fit testing, and will maintain non-medical records pertaining to this program. The Coordinator or alternate can be reached at 2-1591. UFTR management and staff are responsible for identifying situations that may require the use of a respirator and for purchasing the respirators. For portions of the program that fall under the University of Florida Respiratory Protection Program, EH&S is responsible for the administration of that program.

The employee is responsible for obtaining a physician's clearance to wear a respirator, being fit tested and receiving training. The employee shall wear the respirator as required and ensure that the respirator is cleaned, stored and maintained according to the provisions of this program.

IV. WORK AREA SURVEILLANCE

The use of a respirator shall be the last choice of protection against an airborne contaminant. Engineering controls, such as removal of contaminant by decontamination, shall be considered first. If the contaminant cannot be removed from the work area, rotating employee duties to limit exposures may be considered. All other options shall be explored before a respirator is chosen for protection.

Environmental Health and Safety's Radiation Control and Radiological Services Office will make a determination of air sampling frequency to determine potential hazards. Their estimates of exposure will permit proper equipment selection. Additionally Radiation Control and Radiological Services will determine the need to conduct surveys and bioassays to evaluate actual intakes.

V. APPLICABILITY

This program addresses the use of respiratory equipment for routine, nonroutine, and emergency use of respirators.

Routine Use: Respirators are not used routinely at the UFTR.

Nonroutine Use: During periods of extraordinary maintenance such as unstacking the core for component repair or replacement, it may be determined that there is a concentration of radionuclides in the air. Evaluation of this concentration may determine that the use of respirators is either required or recommended to provide an additional level of protection for workers.

Emergency Use: An SCBA type respirator may be used during emergency operations when entering an area of unknown radionuclide concentration. Since the SCBA is a positive pressure device, it will provide the maximum protection against the inhalation of radionuclides.

VI. MEDICAL EVALUATION

Since the use of a respirator places unusual stress on the wearer, employees covered by this program must be evaluated by a physician and receive the physicians clearance to wear a respirator. Employees shall be evaluated prior to initial fitting and at a frequency determined by a physician. For the UFTR Respiratory Protection Program, subject to a physician's approval, the frequency of medical evaluation will be at 24 months intervals up to age 45 to coincide with the biennial operator relicensing physical requirement. An annual evaluation will be applicable for individuals at age 45 or over.

VII. TRAINING

In compliance with the OSHA Respiratory Protection Standard, the UFTR facility requires all employees who wear respirators and their supervisors to undergo training in the proper selection, use, care and maintenance of respiratory protective equipment. This training shall be repeated annually. The minimum contents of this training shall include:

- Responsibilities of supervisors and workers
- Selection, use, care and limitations of the respirator
- The hazards of anticipated contaminants and their identification
- The opportunity to handle and wear the respirator prior to actual use
- Proper fitting, including demonstrations and practice in donning, adjusting and determining the fit of the unit under test conditions and by utilizing a negative/positive pressure fit check
- Cleaning, maintenance and storage of the respirator
- Cartridge/filter changeout schedule
- Requirements for periodic medical evaluation

VIII. RESPIRATOR SELECTION

Respirators are selected on the basis of the hazards to which employees may be exposed. Only respirators approved by the National Institute for Occupational Safety and Health (NIOSH) and the Mine Safety Health Administration (MSHA) are utilized at the UFTR. The most commonly used respirators at the UFTR are the 3M 6000 negative pressure half mask and the MSA Air Mask Model 401(SCBA){MSHA/NIOSH certification numbers}:

3M 6000 HALF MASKMSHA-NIOSH APPROVAL # TC-21C-548
ISSUED TO 3M APRIL 17, 1991

MSA AIR MASK MODEL 401 (SCBA) MSHA-NIOSH APPROVAL # TC-13F-30
ISSUED TO MSA NOVEMBER 29, 1977

IX. ISSUE, FIT CHECKS, INSPECTION AND MAINTENANCE

After being medically approved for respirator use, the employee will be issued the appropriate size 3M 6000 Half Mask. Prior to use the mask must be fit tested. The fit test can either be quantitative or qualitative. It is preferable to conduct a quantitative fit test initially and every year thereafter. Qualitative tests are performed in the interim before a quantitative test can be scheduled. The quantitative test shall be conducted by EH&S personnel with the qualitative test conducted by either EH&S or an individual at the facility who has been trained by the EH&S Respirator Coordinator.

Each employee issued a respirator shall inspect the respirator prior to each use to ensure that it is in good condition. This inspection shall include a check of the tightness of connections and the condition of the facepiece, headbands, valves, cartridges and filters (as applicable). The mask itself shall be inspected for signs of deterioration. If any defects are noted, the respirator must be repaired or replaced. Repairs shall be made using only manufacturer-approved parts, and if the repair cannot be made immediately, a replacement mask of the same type and size shall be used until such time as the repair can be made. Only experienced persons shall do replacement or repairs with parts designed for the apparatus. No attempt shall be made to replace components or to make adjustment or repairs beyond the manufacturer's recommendations.

Each respirator shall be cleaned and sanitized after use by the respirator wearer. This shall be done in accordance with the manufacturer's recommendations.

When not in use, respirators shall be placed in individual containers to protect them from contamination. Approved storage areas at the UFTR facility include the Emergency Response Center (room 108 NSC) and the Auxiliary Emergency Support Center (Room 106 NSC).

X. 3M 6000 HALF MASK PROCEDURES FOR USE

A. Fitting Instructions

1. Place the respirator over the mouth and nose, then pull the head harness over the crown of the head.
2. Take the bottom straps in both hands, place them in back of the neck and hook them together.
3. Position the facepiece low on the bridge of the nose for optimal visibility and best possible fit.
4. Adjust top straps first, then the lower neck straps by pulling on the ends. DO NOT pull too tight! (Strap tension may be decreased by pushing out on the back side of buckles.) Perform a positive pressure and a negative pressure facefit check.

B. Positive/Negative Pressure Testing

It is mandatory to check respirators for operability immediately prior to each use. They shall be verified to be in good physical condition and in proper working order in the following manner.

POSITIVE PRESSURE FIT CHECK: Place the palm of the hand over the exhalation valve cover and exhale gently. If the facepiece bulges slightly and no air leaks are detected between your face and the facepiece, a proper fit has been obtained. If face seal air leakage is detected, reposition the respirator on the face and/or readjust the tension of the elastic straps to eliminate the leakage. Repeat the above steps until a tight face seal is obtained. If proper fit cannot be achieved, notify supervisory personnel and DO NOT enter the contaminated area..

NEGATIVE PRESSURE FIT CHECK: Place thumbs onto the center portion of the filters, restricting the airflow into the breathing tube of the filter, and inhale gently. If the facepiece is felt to collapse slightly and pull closer to the face with no leaks between the face and the facepiece, a proper fit has been obtained. If face seal air leakage is detected, reposition the respirator on the face and/or readjust the tension of the straps to eliminate the leakage. Repeat the above steps until a tight face seal is obtained. If proper fit cannot be achieved, notify supervisory personnel and DO NOT enter the contaminated area.

Respirator users shall leave the contaminated area at any time for relief from respirator use in the event of equipment malfunction, physical or psychological distress, procedural or communication failure, significant deterioration of operating conditions, or any other conditions that might require such relief.

IMPORTANT: Before using respirator, wearer must read and understand the uses and assembly instruction on respirator package and its enclosed 6000 series instruction booklet for fitting instructions and NIOSH/MSHA approvals.

XI. MSA MODEL 401 SCBA PROCEDURE FOR USE

A. Fitting Instructions

Pull out the facepiece headband straps so that the ends are at the buckles, and grip the facepiece between thumb and finger. Insert the chin into lower part of the facepiece and pull headbands back over the head to obtain a firm and comfortable fit against the face at all points. Adjust headband as follows:

1. See that straps lie flat against the head.
2. Tighten lower or "neck" straps.
3. Tighten "side" straps (do not adjust forehead or "front" strap).
4. Place both hands on headband pad and push in towards the neck.
5. Repeat operations (2) and (3)
6. Tighten forehead or "front" strap if necessary to position the lens for best vision.

B. Fit Testing Prior To Use

It is mandatory to check respirators for operability immediately prior to each use. They shall be verified to be in good physical condition and in proper working order in the following manner.

Test the mask facepiece for tightness by squeezing the corrugated breathing tube tightly. Inhale gently so that the facepiece collapses slightly and hold breath for ten seconds. The facepiece will remain collapsed while the breath is held providing the assembly is gas tight. If any leakage is detected around the facial seal, readjust head harness straps. If other than facial seal leakage is detected, investigate the condition and correct.

Test the complete system for air flow from the cylinder to the facepiece by breathing normally. The regulator should follow the normal breathing pattern.

Test the By-Pass (red) valve by opening it briefly. With the By-Pass valve open, a rush of air should be delivered to the facepiece. If the rush of air is delivered, the apparatus is ready for use. Close the By-Pass valve. Breath normally as the apparatus automatically satisfies breathing requirements.

Respirator users shall leave the contaminated area at any time for relief from respirator use in the event of equipment malfunction, physical or psychological distress, procedural or communication failure, significant deterioration of operating conditions, or any other conditions that might require such relief.

IMPORTANT: Before using respirator, wearer must read and understand the uses and assembly instruction on respirator package. Users must follow MSA instructions for "Use and Maintenance".

XII. EMERGENCY PREPAREDNESS

For all aspects of a radiological emergen· with airborne contamination involving the use of respirators, the UFTR Emergency Pl· hall be followed.

The possibility also exists that a non-radiological emergency could occur (for example: an ammonia spill). In such cases the area should be evacuated as necessary and EH&S called at 392-1591. For a spill occurring after normal working hours UPD should be called at 392-1111. EH&S / UPD will coordinate spill cleanup using the resources at their disposal. Should a toxic, flammable, or otherwise dangerous spill require the evacuation of the reactor control room, the operator present shall ensure the reactor is shut down and secured.

To ensure proper fit of a respirator the UFTR shall maintain adequate clean-shaven (in areas that would effect the mask to face seal) personnel qualified in the use of an SCBA to ensure appropriate emergency response.

For those employees requiring the use of glasses, who would be expected to wear a SCBA in an emergency situation, MSHA/NIOSH approved MSA part #454819 will be installed to allow the use of prescribed lenses. Wearing of contact lenses is permissible and would not interfere with the mask seal.

XIII. REFERENCES

1) Nuclear Regulatory Commission. 10 CFR 20.1701 → 20.1703

2) University of Florida Respiratory Protection Program 7/98

3) Nuclear Regulatory Commission Information Notice 97-66 and 98-20:Problems with Emergency Preparedness Respiratory Protection Programs

4) Emergency Plan for the UFTR 10/83 Through Revision 10 12/97

XIV. SIGNATURE APPROVAL

Mr. John Powers (Acting Reactor Manager) — Date: 7/27/98

William G. Vernetson, Ph.D. (Facility Director) — Date: 7/30/98

Reactor Safety Review Subcommitee — Date: 7/30/98