

UNIVERSITY OF VIRGINIA REACTOR FACILITY
EMERGENCY PLAN IMPLEMENTING PROCEDURES

Revision 1

September 30, 1985

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EPIP-1 Emergency Director Controlling Procedure

Purpose: This is the Controlling Procedure which initiates the Emergency Plan's implementation. Initial assessment of a potential emergency condition is facilitated and the initiation of corrective and protective actions through implementation of subordinate EPIP's is begun.

User: Reactor Facility Director, Reactor Supervisor or most senior staff member present at Nuclear Reactor Facility who is to assume the role of Emergency Director. See Organizational chart, Attachment 2 to EPIP-1.

Entry Conditions to this EPIP:

- a. A potential emergency condition is reported to the senior operator on call, or
- b. Another procedure directs continuation of this procedure.

Instructions: Continue through each EPIP-1 step even after other EPIP's are initiated. Go from step to step until otherwise instructed.

1. Initiation of Procedure:

- a. By: _____
- b. Date: _____
- c. Time: _____

2. Identification of Most Probable "Unusual Events" which require immediate action:

ATTACHMENT 1 to EPIP-1
EMERGENCY ACTION LEVELS

1. Unusual Events Emergency

- a. Actual or projected radiological effluents at the site boundary, exceeding 10 MPC for unrestricted areas when averaged over 24 hours, or leading to an exposure of 15 mRem whole body accumulated in 24 hours. For air: $10 \text{ MPC} = 2 \times 10^{-13}^* \mu\text{Ci/cc}$; For water: $10 \text{ MPC} = 3 \times 10^{-7}^* \mu\text{Ci/ml}$; Dose rate at site boundary $\geq 0.625 \text{ mRem/hr}$ averaged over 24 hour period.

* (Providing no isotopic analysis is performed. If analysis is performed the less stringent limitations of 10 CFR Part 20, Appendix B apply.)

- b. Report or observation of a severe natural phenomenon that is imminent or existing.
- c. Threats or breaches of security.
- d. Fuel damage accident that releases radionuclides in the confinement area, which may be indicated by the following:
- (1) Sustained reading at the UVAR Reactor bridge radiation monitor of 1R/hr or greater after the UVAR Reactor is or has been shut down.
 - (2) Pool water samples indicating a fission product activity of greater than $1 \times 10^{-3} \mu\text{Ci/ml}$.
- e. Fire within the Reactor facility lasting more than 10 minutes.

f. Personal injuries that are complicated by radio contamination problems or radiation exposure.

2. Alert Emergency

a. Actual or projected radiological effluents at the site boundary, exceeding 50 MPC for unrestricted areas when averaged over 24 hours, or leading to an exposure of 75 mRem whole body accumulated in 24 hours. For air: $50 \text{ MPC} = 1 \times 10^{-12}^* \mu\text{Ci/cc}$; For water: $50 \text{ MPC} = 1.5 \times 10^{-6}^* \mu\text{Ci/ml}$; Dose rate at site boundary $\geq 3.125 \text{ mRem/hr}$ averaged over 24 hour period.

* (Providing no isotopic analysis is performed. If analysis is performed the less stringent limitations of 10 CFR Part 20, Appendix B apply).

b. Radiation levels at the site boundary of 20 mRem/hr for one hour whole body.

c. Abnormal loss of water from the UVAR Reactor pool, used for shielding or coolant of irradiated reactor fuel, indicated by a drop in pool level of greater than one inch every ten minutes (rate which exceeds the makeup capacity).

d. Loss of radioactive material control, that causes radiation dose rates or ambient radionuclides to increase ambient exposure levels to 100 mrem/hr throughout the Reactor Facility. The resulting increase will trigger an emergency response only if it can't be explained in light of actual operational activities.

e. Fire that may affect reactor safety systems.

- f. Explosion that affects reactor operations.
- g. Radiation dose rates in the Reactor Facility that provide an unanticipated sustained reading of 1 R/hr or greater on either the UVAR Reactor Bridge or ground floor experimental area radiation monitors, with the Reactor having been in the shut-down mode for several minutes. These sustained dose rates require the evacuation of all personnel from the Facility.
- h. Any other situation or condition determined to fall in this class by the Facility Director or Reactor Supervisor.

3. Site Area Emergency

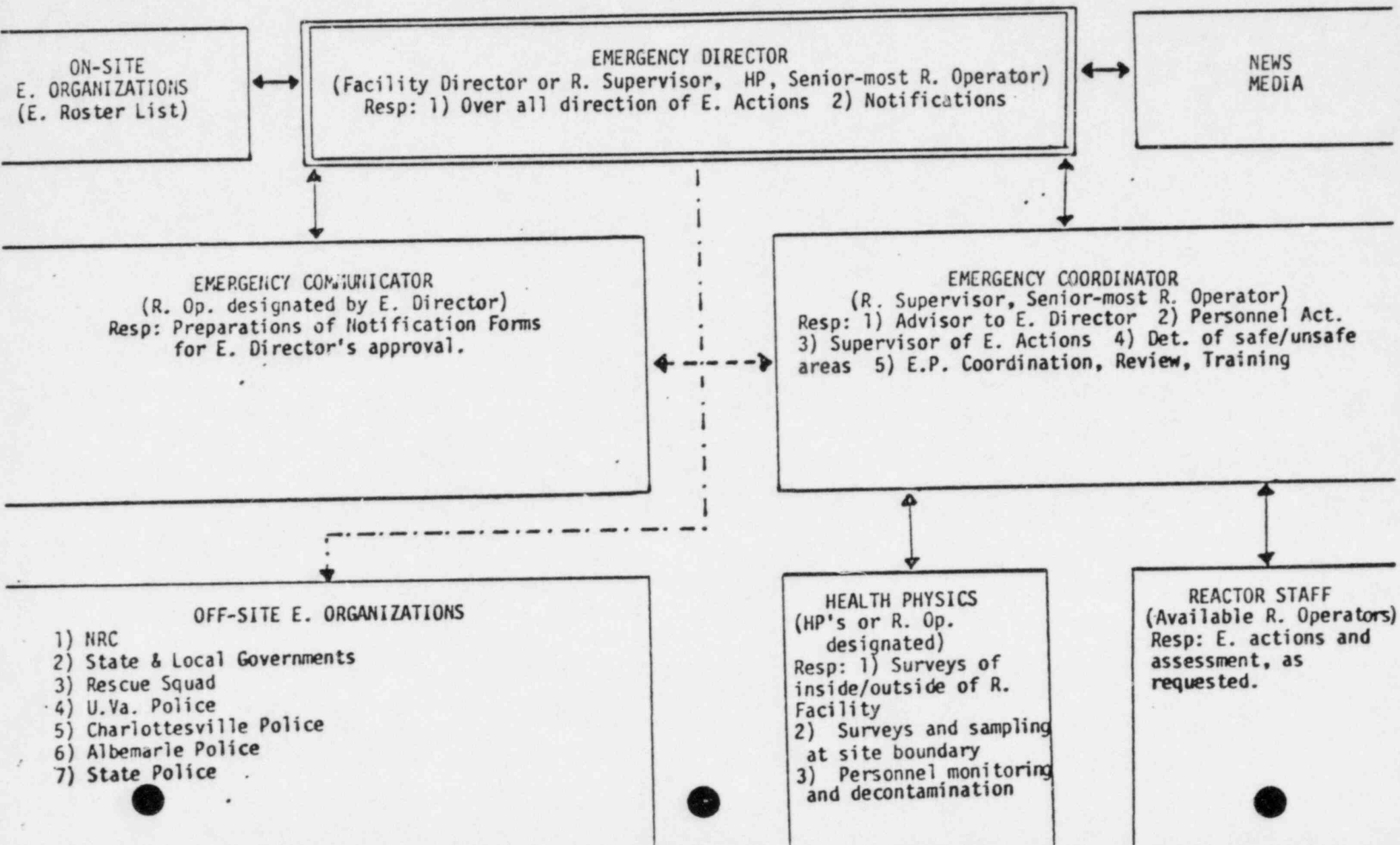
- a. Actual or projected radiological effluents at the site boundary, exceeding 250 MPC for unrestricted areas when averaged over 24 hours, or leading to an exposure of 375 mRem accumulated in 24 hours. For air: $250 \text{ MPC} = 5 \times 10^{-12}^*$ $\mu\text{Ci/cc}$; For water: $250 \text{ MPC} = 7.5 \times 10^{-6}^*$ $\mu\text{Ci/ml}$. Dose rate at site boundary $\geq 15.625 \text{ mRem/hr}$ averaged over 24 hours.

*(Providing no isotopic analysis is performed. If analysis is performed the less stringent limitations of 10 CFR Part 20, Appendix B apply.)

- b. Actual or projected radiation levels at the site boundary of 100 mRem/hr for one hour whole body.
- c. Abnormal continuing loss of reactor coolant water from the UVAR reactor pool, used for shielding or coolant of irradiated

ATTACHMENT 2 to EPIP-1

ON AND OFF-SITE EMERGENCY ORGANIZATION CHART



EPIP-6 Notification of Emergency Response Personnel and Support Organizations

Purpose:

1. To notify on-site and off-site emergency response personnel of an emergency situation.
2. To notify off-site emergency support organizations that may be asked to provide assistance during the course of the emergency.

User: On-site emergency team member designated by Emergency Director to be Emergency Communicator.

Entry Conditions: Initiation directed by the Emergency Director and by any of the EPIP's 1, 2, 3, 4 and 5.

1. Initiation of Procedure:

a. Initiated by: _____

Time: _____

Date: _____

2. Notification On-Site Emergency Response Personnel:

- a. Use all available telephones (or back up radios and WT's) and personnel to make notifications as rapidly (and regularly) as possible:

(1) call, in order, the individuals not present at the Facility who are listed in the Emergency Actions list under the heading of "Reactor Facility Staff" and which are also named in the following list:

<u>On-Site Emergency Response Personnel</u>	<u>Home Telephone</u>	<u>Time Notified</u>
R.U. Mulder, Director	296-6588	_____
J.P. Farrar, Reactor Supervisor (Admin.)	973-3110	_____
J.E. Henderson, Reactor HP	978-7551	_____
P.E. Benneche, Reactor Supervisor (Oper.)	979-3286	_____
B. Hosticka, Senior Reactor Operator	977-0416	_____
G.D. Conley, Senior Reactor Operator	823-2457	_____
R. Ritenour, Reactor Operator	973-2926	_____
T. Nguyen, Reactor Operator	978-4531	_____
C. Cobb	973-4067	_____

(2) record above the time notification has been completed.

(3) inform Emergency Director that notification of on-site emergency response personnel has been completed.

3. Notification of Off-Site Emergency Support Organizations:

- a. Emergency messages will be transmitted with text to be approved by the Emergency Director. Emergency Communications equipment is described in EPIP-17 "Emergency Communications".
- b. Notify off-site support organizations as directed by the Emergency Director giving priority to those whose services may be required immediately. Use the list given on next page.

<u>ORGANIZATION</u>	<u>CONTACT PERSON</u>	<u>TELEPHONE</u>	<u>TIME NOTIFIED</u>
UVA RADIATION SAFETY OFFICE	J. HENDERSON	978-7551(H)	_____
	B.G. Copcutt	924-8997(W)	_____
	.	978-4666(H)	_____
	J.R. Gilchrist	924-7961(W)	_____
		973-2402(H)	_____
UVA POLICE		9-911	_____
		or	
		924-7166	_____
		or	
		924-7167	_____
CHARLOTTESVILLE- ALBEMARLE RESCUE SQUAD		295-1191	_____
CHARLOTTESVILLE FIRE DEPT.		295-1125	_____
UVA MEDICAL CENTER		924-2231	_____
LOCAL POLICE ENFORCEMENT AGENCIES		295-4151	_____

September, 1985

INITIAL EMERGENCY ACTIONS

UNIVERSITY OF VIRGINIA REACTOR FACILITY

In the unlikely event of a radiological emergency at the Reactor Facility the building evacuation alarm will be activated and the UVAR and CAVALIER reactors will be shutdown. All occupants will exit the Facility and the senior individual on site will notify the Director of the Reactor Facility or a Reactor Supervisor. If none of them are present, the senior staff member will be in charge until the Director or Supervisor arrive. In addition to calling the people listed below, the Emergency Director should consult the Emergency Plan's Implementing Procedures (EPIP's).

<u>Reactor Facility Staff</u>	<u>Home Telephone</u>
R.U. Mulder, Director	296-6588
J.P. Farrar, Reactor Supervisor (Administrative)	973-3110
P.E. Benneche, Reactor Supervisor (Operations)	979-3286
B. Hosticka, Senior Operator	977-0416
G.D. Conley, Senior Operator	823-2457
R.L. Ritenour, Senior Operator	973-2926
T.L. Nguyen, Reactor Operator	978-4531
C.C. Cobb, Reactor Operator	973-4067

<u>Other Emergency Numbers</u>	<u>Office</u>	<u>Home</u>
J. Henderson, Health Physicist	4-7589	978-7551
T. Turley, Radiation Safety Tech.	4-7136	295-2703
B.G. Copcutt, Radiation Safety Officer, U.Va.	4-8997/4-7334	978-4666
J.R. Gilchrist, Radiation Safety Office	4-7850	973-2402
University Police	4-7166/4-7167	

If deemed necessary, the following organizations will be called:

Rescue Squad	295-1191	Albemarle Police	296-2112
City Police	295-4151	State Police	293 3223
Fire Department	295-1125	U.Va. Hospital	4-225 32
Nuclear Regulatory Comm.	(404)221-4503	Va. Office of	
Virginia Dept. of Health		Emergency Serv.	(804)323-2300
Radiological Division	(804)786-5932		

Following evacuation of the Reactor Facility the evacuees will assemble at the primary assembly area under supervision of a Senior Operator. The area will be surveyed with a portable survey instrument and its suitability for occupancy determined by the Senior Operator.

Upon notification of an emergency at the Reactor Facility, the Health Physicist and personnel of the Radiation Safety Office will proceed immediately to the Reactor site and at the direction of the E. Director conduct surveys. They will determine which areas, if any, are unsafe and will issue any specific instructions necessary for protection of personnel. They will also monitor the airborne activity, if any, until it has dispersed to negligible levels.

It is anticipated that any radioactive releases will be confined primarily within the reactor room. However, to ensure that protective and corrective actions are taken in the event that levels of radioactivity exceed the limits specified for unrestricted areas by 10 CFR Part 20, the radiation levels at the site boundary downwind from the reactor building will be monitored. (The wind direction and velocity are indicated by instruments located on the main floor of the reactor building.)

If it is determined that airborne radioactivity releases greater than those allowed in unrestricted areas by 10 CFR 20 have occurred or are likely, as indicated by radiation dose rates exceeding 2 mrem/hr at the site boundary, additional surveys will be made beyond the reactor site boundary to determine the extent of the affected area. If the affected area cannot be determined in a timely manner, this area will be assumed to be the area in the downwind sector (a sector is 22.5 degrees) and the adjacent two sectors to a distance of 2,000 feet radius from the Reactor Facility. Installations within this radius include the Centrifuge Building, McCormick Observatory, the Filtration Plant, the Accelerator Building, the Radio Astronomy Building, the Highway Research Council Building, the Mineral Resources and Forestry Building, the University Maintenance Shops, the Students' Dormitories extending to the entrance to Scott Stadium, the Slaughter Recreation Center and the Special Materials Handling Facility.

Once the affected area has been defined, the University Police will, at the E. Director's request, notify personnel in this area that a release of radioactive material has occurred and provide instructions to minimize the effect on the public. The most likely instructions will be for personnel to remain indoors with all windows and doors closed and ventilation systems turned off, awaiting further instructions. Evacuation of specific areas will also be considered. The University Police will control access to the affected area.

In the event that individuals at the reactor site are injured in an accident, the Charlottesville-Albemarle Rescue Squad and University Hospital will be notified. An ambulance with advanced life support capability will be sent immediately to the scene of the accident. If the condition of the injured patient has been stabilized, the patient will be decontaminated to the extent necessary or possible at the reactor site prior to transfer to the Emergency Medical Service. The University Hospital is prepared to receive and treat at once any individual who has received a significant radiation over-exposure.

The Emergency Director will notify the University Police and other organizations of the termination of an emergency.

Copies of these initial emergency response actions will be posted in prominent places at the Reactor Facility, the Office of the University Police, the Special Materials Handling Facility, and the Radioactive Waste Management Facility. Further detailed emergency procedures are to be found in the Reactor Facility's Emergency Plan and Emergency Plan Implementing Procedures (EP and EPIP's).

EPIP-7 Notification of State and Local Governments

Attachments:

1. Report of Emergency to State and Local Governments
2. Report of Radiological Condition to the State

Purpose:

1. To initially notify state and local governments of the declaration of an emergency.
2. To provide periodic status updates to state and local governments during an emergency.
3. To notify state and local governments of any change in emergency status.

User: On-Site emergency team member designated by Emergency Director to be Emergency Communicator.

Entry Conditions:

Any one of the following:

a) Emergency is declared

or

b) Approximately 30 minutes have passed since last notification

or

c) The status of any notification item has changed

or

d) Entry to EPIP-7 is directed by the Emergency Director,

Note: The initial notification of an emergency to state and local governments must be made within 15 minutes following the declaration of the emergency.

Procedure No. 7 of the University of Virginia Reactor Facility Plan and be ready to transcribe data onto your copy of Attachment 2 to EPIP-7."

c. Go to Step 19.

18. Inform the State that a "Report of Radiological Conditions (Attachment 2 to EPIP-7) Will Not Be Sent:

a. Use the telephone system to reach the duty officer at the Office of Emergency Services of the State of Virginia at 1-804-323-2300.

b. The following type of message is recommended:

"This is the University of Virginia Reactor Facility, Charlottesville, Va. Despite the declaration of an (E. Classification) emergency at our Facility, we will not transmit a report of radiological conditions to you at this time since a release of radioactive material has not occurred and is not projected to occur. Please refer to your copy of the University of Virginia Reactor Facility Emergency Plan and associated EPIP-7."

c. Go to Step 32

19. Obtain Radiological Report Form:

a. Find and obtain copy of Attachment 2, "Report of Radiological Conditions to the State"; located at the end of this procedure.

Note: The initial report of radiological conditions must be transmitted to the state as soon as possible following the declaration of an emergency involving an off-site release of radioactive material and/or the declaration of a General Emergency.

5. Radiological Survey Assessment Considerations:

A. Portable instruments.

- 1) Portable instruments should be used which are calibrated quarterly against an NBS-traceable source or laboratory standard.
- 2) These instruments are best used for detector purposes, but are not adequate for quantitative radiation level measurements.

B. Fixed-Instruments:

- 1) Fixed instruments should be used which are maintained and calibrated by the reactor staff.
- 2) Measurement data from these instruments is to be used to project dose rates based on further spectral analysis of any filtered effluent and well-accepted Health Physics dose calculations.

C. Low Background Counter:

- 1) The low background alpha-beta proportional counter located in the low-background counting room is to be the primary instrument used for determining contamination levels inside and outside the Reactor Facility.
- 2) The counter is to be calibrated during such use with an NBS traceable source or laboratory standard.

D. Results of Surveys and Recommended Corrective Actions are to be given to the Emergency Director.

6. Terminate EPIP-9, "Radiological Surveys":

- A. Forward completed EPIP and forms to Emergency Director for review and record keeping.
- B. Return to initiating EPIP.

4. Personnel Emergency Exposure Limits

Should a situation occur in which emergency personnel are needed for entry into an area of high radiation that would result in personal exposures in excess of 10CFR-20 limits, for the purpose of saving life, reducing property damage or reducing the risk of exposure to the general public, volunteers will be approved by the Emergency Director.

Recommended limits for emergency exposure are 25 Rem, whole body dose to reduce property damage and 75 Rem, whole body dose to save a life.

According to 10 CFR 20.403, if emergency doses have been received, the Administrator of Region II has to be notified of the occurrence by telephone and telex within 24 hours. A written report has to be sent to the Director of Regulatory Operations (or current title), NRC, Wash. D.C. 20545 with a copy to the Administrator of Region II, within 30 days.

If 10CFR-20 exposure limits are indeed exceeded, the Nuclear Regulatory Commission shall be notified in accordance with 10 CFR 20.403.

5. Terminate EPIP-10.

Terminated by: _____

Time: _____

Date: _____

NEEP Faculty (to be updated periodically)

<u>Presence</u>	<u>Film Badge</u>	
a.(✓) if here		
<u>b.(x) if badge on rack</u>	<u>Number</u>	<u>Name</u>
1. _____	M-2011	John W. Boring
2. _____	M-2046	Jack S. Brenizer
3. _____	M-2172	John J. Dorning
4. _____	M-2014	Robert E. Johnson
5. _____	M-0003	W. Reed Johnson
6. _____	M-2002	James L. Kelly
7. _____	M-2010	Ralph A. Lowry
8. _____	M-0002	James L. Meem
9. _____	M-2003	Dale R. Metcalf
10. _____	M-2009	Albert B. Reynolds
11. _____	M-0213	Rydin, Roger A.
12. _____	M-0004	Williamson, Thomas G.

NEEP Students (to be updated periodically)

Presence

a.(✓) if here

b.(x) if badge on rack

Number

Name

M-2158 Akers, Sarah L

M-2153 Aschbrenner, Roger A

M-2221 Azizuddin, Khawia

M-2168 Azmy, Yousry Y

M-2111 Blaha, Dean

M-2175 Caimano, Steven M

M-2165 Chrisey, Douglas B

M-00853 Coffey, Bruce E

M-2165 Comfort, Gary C

M-2176 Cui, Shengting

M-0803 Feather, Melvin J

M-2146 Felber, Joseph L

M-2191 Fisher, John

M-2217 Fehr, Mary

M-2072 Frenier, David J

M-2161 Funsten, Herbert O

M-2154 Hagemeyer, Derek A

M-2132 Halsall, A.C.

NEEP STUDENTS CONTINUED:

_____	M-2149	Hancock, James W
_____	M-0796	Harrell, John R
_____	M-2071	Harvie, Edwin J
_____	M-0850	Heinecke, Steven H
_____	M-2148	Hines, William G
_____	M-2112	Holman, Robert B
_____	M-2220	Holloway, James P
_____	M-2177	Howard, Michael A
_____	M-2164	Jones, David C
_____	M-2129	Keller, Karl S
_____	M-2125	Kim, Sung Tae
_____	M-2142	Ku, Jenq-Yann
_____	M-2151	LaPrade, Michael N
_____	M-2069	Lutz, Jeffrey
_____	M-2036	Marshall, Paul
_____	M-2145	McArdle, Kevin R
_____	M-2127	Oshaughnessy, Dennis J
_____	M-2115	Palmer, Jennifer L

NEEP STUDENTS CONTINUED:

_____	M-2156	Payne, Barry
_____	M-2193	John Ramsey
_____	M-02192	Ralph Reda
_____	M-2178	Reimann, Curt T
_____	M-2150	Selby, Lorin C
_____	M-2147	Stoner, Kevin J
_____	M-2047	Sulcoski, Mark
_____	M-0798	Swenson, Bruce
_____	M-2179	Tobin, Kenneth W
_____	M-2118	Trevisan, Paolo
_____	M-2174	Uddin, Rizwan
_____	M-2182	Velasco, Santiago
_____	M-2152	Waldron, Caroline E
_____	M-2173	Walters, Mark
_____	M-0849	Ward, Charles M
_____	M-2160	Wilson, Gary L
_____	M-2119	Wilson, Latresia A
_____	M-2048	Yauger, David P

4. Re-entry at Termination of Emergency:

a) Before allowing re-entry to the facility at the termination of an emergency complete the following check-list:

- 1) _____ Emergency situation no longer exists.
- 2) _____ All pertinent EPIP-s have been terminated.
- 3) _____ Health Physics personnel have declared the building is safe.
- 4) _____ State, local and NRC agencies have been notified of planned re-entry.
- 5) _____ The Emergency Director has given general re-entry approval.
- 6) _____ As per EP 7.4(2), a minimum of 24 hrs has elapsed since the facility evacuation was called and therefore the emergency has been properly assessed.

5. Terminate EPIP-19, "Reentry":

- a) Forward completed EPIP-19 to E. Director for review and record keeping.
- b) Return to initiating EPIP.
- c) Close-out:

Completed By: _____

Time: _____

Date: _____