

1612
Revision 6
06/12/78

THREE MILE ISLAND NUCLEAR STATION
HEALTH PHYSICS PROCEDURE 1612
MONITORING FOR PERSONNEL CONTAMINATION

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Unit 1 Staff Recommends Approval

Approval NA Date —
Cognizant Dept. Head

Unit 2 Staff Recommends Approval

Approval NA Date —
Cognizant Dept. Head

Unit 1 PORC Recommends Approval

NA Date 6-9-78
✓—Chairman of PORC

Unit 2 PORC Recommends Approval

J. J. Hillish Date 6-12-78
Chairman of PORC

Unit 1 Superintendent Approval

NA Date 6/9/78

Unit 2 Superintendent Approval

JA Schelling Date 6/12/78

Manager Generation Quality Assurance Approval

NA Date —

THREE MILE ISLAND NUCLEAR STATION
STATION HEALTH PHYSICS PROCEDURES

1612 - Monitoring for Personnel Contamination

1.0 PURPOSE

This procedure describes the use of personnel monitoring instrumentation.

2.0 DISCUSSION

The prevention of contamination is primarily the responsibility of the individual. To assist personnel in the control of radioactive contamination, monitoring devices have been provided at various points within the controlled area. These areas must have background levels sufficiently low enough to allow the monitoring instrument to detect contamination levels greater than those of a clean area. If a monitor cannot be provided at a step off pad due to elevated background levels, the individual will use the nearest available monitor.

The Radiation Protection Dept. requires all individuals to monitor themselves for contamination when exiting the controlled area.

3.0 REFERENCES

3.1 Radiation Protection Manual - AP 1003

4.0 EQUIPMENT

- 4.1 Frisker (RM-14) with side-window G.M. Tube.
- 4.2 Portable Survey Instruments (Alpha and Beta-Gamma)
- 4.3 Hand and Foot Monitor
- 4.4 Portal Monitor

5.0 OPERATING INSTRUCTIONS

5.1 Frisker (RM-14)

- 5.1.1 The Frisker consists of a side-window Geiger-Mueller probe and a count rate meter with visible and audible alarms. In order to detect low levels of contamination, a Frisker may be located at the step-off pads.
- 5.1.2 Place the ON/OFF Switch to the most sensitive setting. Open the Beta-window so that both Beta and Gamma radiation is detected. The instrument should read background. Note background level.
- 5.1.3 The instrument alarm will be set at 100 CPM above background by Radiation Protection or other designated personnel.
- NOTE: Surveys must be performed in low background areas.
- 5.1.4 Always check the hands for contamination prior to handling the probe. Keeping the probe $\frac{1}{2}$ inch from the surface being monitored, pass the probe over the surface slowly so that the instrument has ample time to respond to the contamination. All exposed parts of the body (face, hair, neck and hands) and clothing should be carefully checked. Shoes (although covered when on the contaminated side of the stepoff pad) must be monitored thoroughly for contamination.
- NOTE: Avoid touching any potentially contaminated surface with the probe to prevent possible probe contamination.

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- 5.1.5 If the alarm sounds notify Radiation Protection Personnel for assistance.

NOTE: In the event that personnel contamination is found, Radiation Protection Personnel will complete Sections B, C and D of Contamination/Exposure Reports form 16121.

- 5.1.6 If detectable contamination (greater than 1000 dpm above background) is found on the head or shoulders of the individual; nose swipes will be taken and counted as follows:
- 5.1.6.1 Swipe inside of each nostril with cotton-tipped swab.
- 5.1.6.2 Break off wood stem, leaving cotton tip and small section of wood stem (tip must fit onto 2" planchet).
- 5.1.6.3 Count cotton-tip for gross $\beta\gamma$ activity.
- 5.1.7 If gross $\beta\gamma$ count from nose swipe is greater than 5000 dpm, count the swipe on the Geli Detector to determine isotopes involved. Forward results to Radiation Protection Supervisor.
- 5.1.8 If gross $\beta\gamma$ count from nose swipe is greater than 10,000 dpm, notify Radiation protection supervision immediately. A Whole Body Count must be scheduled for the period between the 6th and 12th day post uptake.
- 5.1.9 If gross $\beta\gamma$ count from nose swipe is greater than 50,000 dpm, notify Radiation Protection Supervision immediately. A whole body count must be performed as soon as possible.

NOTE: Based on the Geli analysis of isotopes involved, Whole Body Counting requirements of 5.1.7 and

5.1.8 may be altered with the approval of the
Supervisor of Radiation Protection and Chemistry.

5.2 Portable Survey Instrument

5.2.1 Beta-Gamma Survey Instruments

- 5.2.1.1 A Beta-Gamma portable survey instrument consists of a Geiger-Mueller probe with a beta window which can be opened or closed. The probe is attached to a readout meter. There is no alarm system on the instrument.
- 5.2.1.2 Place the ON-OFF switch of the portable survey instrument at the most sensitive position. Open beta window so both beta and gamma radiation are detected. The instrument should be recording background radiation. Note background level. Follow the same monitoring procedure outlined in Section 5.1.4.
- 5.2.1.3 Because there are no alarms on Beta-Gamma portable survey instruments, the meter response must be observed while surveying. Increases greater than 100 CPM above background indicate that contamination is present. Notify Radiation Protection Personnel for assistance.

5.2.2 Alpha Survey Instruments

- 5.2.2.1 An alpha portable survey instrument consists of a scintillation detector probe with a rate meter. There is no alarm system on the instrument. The scintillation detector is covered with a thin layer of mylar which allows alphas to pass through to the detector but blocks out all light.

- 5.2.2.2 Place the ON/OFF switch of the survey instrument at the most sensitive position. Background readings should be zero.
- 5.2.2.3 Point the detector at a light source, e.g. fluorescent light. If upscale reading is noted, a puncture may exist in the mylar window. Return the instrument to Radiation Protection Personnel.
- 5.2.2.4 Follow the same monitoring procedure outlined in Section 5.1.4
- Note: It is important that the probe be kept $\frac{1}{2}$ inch or less from the surface being monitored since the range of alpha particles in air is only a few centimeters.
- 5.2.2.5 Observe the meter response while surveying. Any stable upscale reading indicates alpha contamination is present. Notify Radiation Protection Personnel for assistance.
- Note: In the event that personnel contamination is found, Radiation Protection Personnel will complete Sections B, C, and D of a Contamination/Exposure Report, form 1612-1.

5.3 Hand and Foot Monitors

- 5.3.1 Hand and Foot monitors provide monitoring cavities for both right and left hands as well as right and left feet. Each cavity consists of four Geiger-Mueller tubes. Individual meters record the counts per minute for each cavity. Visible and audible alarms indicate the location of contamination greater than 100 CPM (or as set) above background. A hand-held Geiger-Mueller tube is also available for monitoring other parts of the body or articles being carried from the controlled area.

5.3.2 All personnel leaving a Controlled Area shall monitor themselves and all hand-carried items before entering a clean area. The individual shall monitor himself by placing his hands and feet in the appropriate cavities of the Hand and Foot monitor. The person should remain in this position for a minimum of 10 seconds. If the alarm is activated, notify Radiation Protection Personnel for assistance in decontamination. Briefcases, notebooks, tools and other items being taken to the clean area must be monitored with the hand probe (beta window open).

5.3.3 All alarms on the Hand and Foot monitors have been preset by Radiation Protection Personnel.

Note: In the event that personnel contamination is found, Radiation Protection Personnel will complete Sections B, C, and D of a Contamination/Exposure Report, form 1612-1.

5.4 Portal Monitor

5.4.1 The portal monitor consists of a frame enclosing seven Geiger-Mueller probes and a foot pad with four G-M detectors. These detectors are connected to a console which has a simplified, visual readout.

Lights on the console are as follows:

ALARM:	Activated when designate count rate is exceeded.
COUNTING:	On during counting time.
RECOUNT:	On when light beam in portal frame is not broken for duration of counting time.
SAFE:	Normally on; off when counting, alarmed, or recounting. When on, it inhibits the alarm of each of the counter modules.

FAILURE: On if a pulse has not been counted within approximately 30 seconds. This light switches off when a pulse is counted.

In addition to the visual alarm, an audible alarm also indicates contamination. Alarm lights are also located on the frame to indicate area of contamination.

5.4.2 All personnel leaving the Access Control Point will pass through a portal monitor. A second portal monitor is provided at the exit of the service Building to the North Parking Lot and may be used by individuals as a final check for contamination.

5.4.3.1 Breaking the beam of light between the side of the frame initiates counting. Count time is approximately 10 seconds. If contamination is detected, the alarms on the console will be activated as well as the alarm light on the frame corresponding to the area of contamination on the body. If the alarm sounds, contact Radiation Protection Personnel for assistance in decontamination.

5.4.4 If the RECOUNT light is activated, the individual did not remain in the Portal Monitor throughout the duration of the count. The individual must step back in the Portal Monitor and be counted again. When a green SAFE light is activated on the console, counting is complete and no contamination was detected.

5.4.5 If the red FAIL light is activated, notify Radiation Protection Personnel for assistance.

NOTE: In the event that personnel contamination is found, Radiation Protection Personnel will complete Sections B, C, and D of a Contamination/Exposure Report from 1612-1.

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CONTAMINATION/EXPOSURE REPORT☐ LOSS OF PERSONAL DOSIMETRY☐ PERSONNEL CONTAMINATION

Name _____ Company _____ Department _____

SS# _____ Date _____ Time _____

Address (If not Met-Ed) _____

A. LOSS OF PERSONAL DOSIMETRYSection 1 - Film Badge/TLD

1. Date Issued _____ Date Lost _____
2. Dosimeter reading covering lost Film Badge/TLD period _____ mrem
3. Reading entered on individuals Radiation Record: Yes _____ No _____
4. Individual restricted from controlled area: Yes _____ No _____

Section 2 - Self Reading Dosimeter

1. Dosimeter Lost ☐ Dosimeter Off Scale ☐ Date _____
2. Film Badge/TLD Evaluated: _____ mrem
3. Film Badge/TLD Reissued: Yes _____ No _____
4. Individual restricted from controlled areas: Yes _____ No _____

B. PERSONNEL CONTAMINATION:

1.

Contaminated Body Areas	Survey Results Highest DPM

PERSONNEL CONTAMINATION: (Cont'd)

08/25/75

2. Method of Decontamination: _____

3.

Decontaminated Body Areas	Survey Results Highest DPM

4. Sample for Urine Bio collected: Yes _____ No _____

5. Individual sent for Whole Body Count: Yes _____ No _____

C. INVESTIGATION REPORT: (Include R.W.P. #)

Form Completed By:

D. RESULTS OF INVESTIGATION: (Completed by Radiation Protection Supervisor/Foreman)

Approved By RP Supv/Foreman

Original: Individual's Radiation History File

cc: HP Lab

Manager - Gen. Oper. - Nuclear

Unit Superintendent

Supv. - Radiation Protection & Chemistry

Safety Representative

Individual's Supervisor

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TMI DOCUMENTS

DOCUMENT NO: TM-081

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WRM
Wilda R. Mullinix, NRC

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