

UNIT 1

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THREE MILE ISLAND NUCLEAR STATION
UNIT #1 EMERGENCY PROCEDURE 1202-12
EXCESSIVE RADIATION LEVELS

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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 7-6-79
Chairman of PORC

Unit 2 PORC Recommends Approval

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Chairman of PORC

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Manager Generation Quality Assurance Approval

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THREE MILE ISLAND NUCLEAR STATION
UNIT #1 EMERGENCY PROCEDURE 1202-12
EXCESSIVE RADIATION LEVELS

12.1 SYMPTOMS

Symptoms of excessive or potentially excessive, radiation levels are as follows: Note that these conditions may occur under both planned and unplanned radioactive releases. Planned releases as covered in HPP 1621 and 1622 are exempt from this Procedure.

- a. RADIATION LEVEL HI alarm on Control Room annunciator AN, light box C-2-1.
- b. Hi alarm (red indicator light) from any radiation monitor, located on Control Room panel PRF.
- c. Radiation monitor rate meter indicates radiation level in excess of Hi Alarm set point

NOTE: Alert and high alarm setpoints are listed in 1102-2.1.

- d. Alert (yellow indicator light) alarm from any radiation monitor, located in Control Room panel PRF.
- e. Radiation monitor rate meter indicates radiation level in excess of Alert Alarm set point.
- f. Significant increases on atmospheric radiation monitors above background levels.

12.2 IMMEDIATE ACTION

NOTE: When an alarm level is reached on an RMS ratemeter, the local alarm light will energize, and the Panalarm "Hi Radiation Level" will annunciate. The annunciator

should then be acknowledged and cleared. If any other ratemeter reaches an alarm level, or if the same ratemeter reaches a higher degree alarm (i.e. High Alarm following Alert Alarm), the Panalarm will again annunciate immediately. However, if a alarm on a particular ratemeter occurs, then clears, and that same alarm on that same ratemeter occurs again in less than one minute, the Panalarm will not annunciate the second time. Therefore, if an alarm occurs and clears, observe the ratemeter closely for one minute to ensure that a recurrence of that alarm will not be missed.

12.2.1 Automatic Action

- a. Receipt of an Alert Alarm.
- b. Receipt of a Hi Alarm.

NOTE: Refer to Alarm Response for specific monitor alarming for details of automatic action, general actions only are given below. Automatic interlocks associated with gas and liquid high alarms are outlined in Enclosure I.

Isolate flow paths in affected systems.

12.2.2 Manual Action

- a. If directed by Shift Supervisor/Shift Foreman, announce the following using the Intra Plant Communications Systems page channel: "Radiation, Hi Alarm, (Location and alarming monitor)".

- b. If applicable, direct personnel involved in maintenance, operation or sampling activities to immediately isolate the source of the radioactive release per the step specified in the applicable special operating procedure.
- c. Ensure that the appropriate control room charts (RMS and Meteorological) are marked with the date and time.

12.2.3 Follow-Up Action

Objective:

Provide steps to sample and analyze high radiation conditions.

- a. Verify that automatic action (if any) specified by Alarm Response has occurred.
- b. Initiate the following action depending upon the type of monitor which is alarming and the type of alarm.

NOTE: Refer to specific Alarm Response for detailed manual action required. Below steps are generally applicable.

(1) Atmospheric Monitor:

NOTE: RESPIRATORY EQUIPMENT MUST BE WORN IN AREAS OF KNOWN AIRBORNE ACTIVITY UNLESS SAMPLES TAKEN INDICATE RESPIRATORY EQUIPMENT IS NOT REQUIRED. IF, FOR SOME REASON, PERSONNEL ARE REQUIRED TO ENTER AREAS OF KNOWN AIRBORNE

ACTIVITY WITHOUT PRIOR SURVEYS, THE
BASIS FOR THE ENTRY AND THE REASONS
FOR WEARING OR NOT WEARING RESPIRATORY
PROTECTIVE EQUIPMENT MUST BE DOCUMENTED
BY THE SHIFT SUPERVISOR ON ENCLOSURE
II.

(a) Alert Alarm:

Sample and analyze as specified in H.P.P.
1676 if required.

NOTE: Velometer readings must be taken
in the affected area and record d
on Enclosure II, Step 11.

Evacuate affected area(s) if analyses
indicate activity in excess of limits for
which an RWP is required (3×10^{-10} $\mu\text{Ci/cc}$)
Determine source of radiation.

Take appropriate action to contain radioactivity
and reduce levels.

COMPLETE THE OPERATIONS PLANNED/UNPLANNED
RELEASE REPORT (ENCLOSURE II).

(b) Hi Alarm:

Clear Affected area of all unnecessary
personnel.

Notify HP Dept. of problem and direct them
as to which area(s) must be sampled and
the type of samples required.

Re-enter affected area using air breathing apparatus to obtain air samples.

Analyze air samples in accordance with HP Procedure 1676.

NOTE: Velometer readings must be taken in the affected area and recorded on Enclosure II, Step 11.

If analyses equals greater than 3×10^{-10} $\mu\text{Ci/cc}$, re-entry to area will be permitted only under RWP.

Determine source of airborne contamination.

Take appropriate action to contain radioactivity and reduce levels.

If RM-A5, RM-A8 and or RM-A9 go into the high alarm condition perform the following:

1. Notify the Health Physics Department.
2. Give wind direction and specify location of site Fence Survey.
3. Insure that the Health Physics Department collects a gas, particulate, iodine and β - γ survey at the site of Fence location.
4. Clear affected area of all unnecessary personnel.
5. Re-enter affected area using air breathing apparatus to obtain air samples.

6. Analyze air samples in accordance with H.P.P. 1676.
7. If analysis equals greater than 3×10^{-10} $\mu\text{Ci/cc}$ re-entry to area will be permitted only under RWP.
8. Determine source of airborne contamination.
9. Take appropriate action to contain radioactivity and reduce levels.

(c) Significant Increase: no alarm

Notify Health Physics Personnel to obtain the following samples and analyze in accordance with HPP 1676:

1. Particulate Increase: Remove and analyze the particulate filter from the appropriate monitor. (Filters from monitors showing greatest count rate increase should be analyzed first).

NOTE: For particulate increases which are not accompanied by gaseous increases, and when GeLi analysis indicates primarily Radium (RA) and/or thorium (TH) isotopes present, the increase is due to naturally occurring

daughter products of these isotopes and unusual weather conditions. Only one filter indicating RA or TH is conclusive, other filters need not be counted. Mark the RMS strip charts to indicate "RA-TH" activity. No further action is necessary.

2. Iodine Increases: Remove and analyze the charcoal filter from the appropriate monitor.
3. Gaseous Increases: Take grab sample with a marinelli beaker and analyze.

Determine the cause of the increase.

Take appropriate action to correct the cause of the increase.

Complete the Operations Planned/Unplanned Release Report (Enclosure II).

NOTE: Velometer readings must be taken in the affected area and recorded on Enclosure II, Step II.

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(2) Gamma Monitor:

(a) Alert Alarm:

Survey affected area(s) using Eberline RAD-owl
RO-1, 0-500 R/hr portable ion chamber, or
equivalent, to verify alarm.

Locate radiation source.

Take appropriate action to reduce radiation
levels.

(b) Hi Alarm:

Survey affected area(s) using Eberline RAD-owl
RO-1, 0-500 R/hr portable ion chamber, or
equivalent, to verify alarm.

If survey indicates radiation levels greater
than 100mr/hr, permit entry to area to locate
radiation source and take action to reduce
radiation levels only under RWP.

Take appropriate action to reduce radiation
levels.

(3) Liquid Monitor:

(a) Alert Alarm:

Notify HP/Chem Dept.

Obtain sample from affected system and analyze
and count sample in accordance with approved HP
and Chem Procedures.

Take action as necessary to contain radioactive
liquid.

Take appropriate action to reduce activity level.

(b) Hi Alarm:

Notify HP/Chem Dept.

Obtain sample from affected system and analyze and count sample in accordance with appropriate HP and Chem procedures. If analysis indicated activity greater than alarm setpoint per 1101-2.1 for closed cooling water systems then isolate affected portion of system if possible. Obtain additional samples from same and/or additional locations and count as required. Take action as necessary to contain radioactive liquid.

Take appropriate action to reduce activity level.

(c) If source of radiation is a spill, refer to Health Physics Procedure 1670.1, Local Emergency Plan.

(4) Complete the Operations Planned/Unplanned Release Report. (Enclosure II)

NOTE: Circle "Planned" or "Unplanned" in title to denote type of release.

Ensure that Personnel Exposures are recorded.

Ensure that Personnel Film Badges/T.L.D. are processed, if needed.

Ensure that the release point cubicle or room air velocity flow is taken. As soon as reasonably possible notify instrumentation to obtain these readings.

Decontaminate as necessary.

Ensure that the calculations for H.P.P. 1676 Attachment A are completed. These calculations include 10 CFR 20.403 evaluation and airborne concentrations that personnel may have been exposed to. In addition these calculations:

- a. Compute Peak & Avg. I^{131} & Particulate release rate (if applicable).
 - b. Compute Peak & Avg. Noble gas release rate.
 - c. Credit the quarterly & annual currie inventing released to the environment.
- c. Complete the Operations Unplanned Release Report (Enclosure II)

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ENCLOSURE I
Interlocks Associated With Radiation
Monitoring System Hi Alarms

1.0 Interlock functions actuated by Hi Alarms from specific atmospheric radiation monitors are as follows:

1.1 Control Room Air Monitor (gas channel), RM-A1.

a. The following fans shutdown if operating:

1. Normal Supply Fans (AH-E-17A, AH-E-17B).
2. Booster Fan (AH-E-95A, AH-E-95B).
3. Controlled Access Area Exhaust Fan (AH-E-20A, AH-E-20B).
4. Kitchen Exhaust Fan (AH-E-21).
5. Hot Machine Shop Air Handling Unit (AH-E-26).
6. Control Building Hallway Fans (AH-E-94A, AH-E-94B).
7. AH-E-93A, 93B.

b. The following dampers assume positions indicated:

1. Controlled Access Area Damper, AH-D-28, closes.
2. Return Air Damper, AH-D-36, opens fully.
3. Outside Air Intake Damper, AH-D-37, closes.
4. Outside Air Relief Damper, AH-D-39, closes.

c. This action places the Control Building Ventilation System in readiness for recirculation operation. Operator action is required to start Emergency Supply Fan (AH-E-18 aor AH-E-14).

1.2 Fuel Handling Building Ventilation Duct Monitor (gas channel), RM-A4:

Fuel Handling Building Supply Fan (AH-E-10) shuts down.

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- 1.3 Auxiliary Building Ventilation Duct Monitor (gas channel), RM-A6:
Auxiliary Building Supply Fan (AH-E-11) shuts down.
- 1.4 Gas Waste Tank Discharge Monitor, RM-A7:
Waste Gas Release Valve, WDG-V47, closes.
- 1.5 Auxiliary and Fuel Handling Building Exhaust Duct (gas channel),
RM-A8.
 - a. The following fans shutdown:
 1. Fuel Handling Building Supply Fan (AH-E-10).
 2. Auxiliary Building Supply Fan (AH-E-11).
 - b. Waste Gas Release Valve, WDG-V47, closes.
- 1.6 Reactor Building Purge Duct (gas channel), RM-A9:
The following valves close:
 - a. Outside Reactor Building Purge Exhaust, AH-V1A.
 - b. Inside Reactor Building Purge Exhaust, AH-V1B.
 - c. Inside Reactor Building Purge Supply, AH-V1C.
 - d. Outside Reactor Building Purge Supply, AH-V1D.
 - e. Reactor Building Sump Outlet Isolation, WDL-V534.
 - f. Reactor Building Sump Outlet Isolation Valve, WDL-V535.
- 2.0 Interlock functions actuated by Hi Alarms from specific liquid
radiation monitor are as follows:
- 2.1 Radioactive Waste Water Discharge Monitor, RM-L6.
Mechanical Draft Cooling Tower Stop Valve, WDL-V257, closes.
- 2.2 Plant Discharge Line Monitor, RM-L7.
The following valves operate as indicated:
 - a. Mechanical Draft Cooling Tower Stop Valve, WDL-V257, closes.

2.3 Miscellaneous Sump Discharge Monitor, RM-L8.

NOTE: RM-L8 has been removed from service WDL-V500 has been failed closed and WDL-V501 failed open to prevent any discharge to the river via RM-L8 discharge path. Sump discharge is routed to the Miscellaneous Waste Storage Tank.

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(CIRCLE PLANNED OR UNPLANNED)
OPERATIONS PLANNED/UNPLANNED RELEASE REPORT

(SHIFT SUPERVISOR: Complete Sections #1 through #11)

1. DATE: _____ 2. TIME: _____
3. RMS AND METEROLOGICAL CHARTS MARKED: Yes _____ No _____
4. Radiation Protection Dispatched for Environmental Samples Yes _____ No _____
5. DESCRIPTION AND CAUSE: _____

6. IMMEDIATE CORRECTIVE ACTION: _____

7. TOTAL TIME OF RELEASE: _____
8. SAMPLE ANALYSIS:
- a. Gas Sample Yes _____ No _____ Location _____
Results: _____

- b. Iodine Sample Yes _____ No _____ Location _____
Results: _____

- c. Particulate Sample Yes _____ No _____ Location _____
Results: _____

- d. Radiation Survey Yes _____ No _____ Location _____
- e. Contamination Survey Yes _____ No _____ Location _____

9. PERSONNEL EXPOSURE: (List all personnel involved in incident)

insure film Badges/TLD's are developed within 24 Hours

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NAMES

EXPOSURE RESULTS

(MREM)

TIME IN AREA OF

POTENTIAL RELEASE

10. PERSONNEL CONTAMINATION: Yes _____ No _____

Names: _____

11. Air Flow-Velocity Determination Results _____ C.F.M.

Location _____

12. RECOMMENDATIONS FOR CORRECTIVE ACTION _____

13. FORM COMPLETED BY: _____

Shift Supervisor

(Forward the original form to the Unit Superintendent and copies to the Station Superintendent, Manager of Generation Operations, Supervisor of Operations and the Health Physics Supervisor) HP to include 20.403 and personnel exposure info. below per page 4.

14. ENGINEERING EVALUATION: _____

COMPLETED BY: _____

15. REVIEWED BY: _____

(Forward the completed form to the Unit Superintendent)