

1610
Revision 7
09/30/77

THREE MILE ISLAND NUCLEAR STATION
STATION HEALTH PHYSICS PROCEDURE 1610
ESTABLISHING AND POSTING AREAS

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Unit 1 Staff Recommends Approval

Approval MA Date _____
Cognizant Dept. Head

Unit 2 Staff Recommends Approval

Approval MA Date _____
Cognizant Dept. Head

Unit 1 PORC Recommends Approval

CE Hartman Date 9-26-77
✓ - Chairman of PORC

PORC comments of _____ included
(date)

By _____ Date _____

Unit 2 PORC Recommends Approval

J. L. Seelinger Date 9/27/77
Chairman of PORC

PORC comments of _____ included
(date)

By _____ Date _____

Approval [Signature] Date 9/27/77
Station Superintendent/
Unit Superintendent

THREE MILE ISLAND NUCLEAR STATION
STATION HEALTH PHYSICS PROCEDURES
1610 - Establishing and Posting Areas

1.0 PURPOSE

This procedure describes the criteria used in establishing and posting areas of potential radiation hazards.

2.0 DISCUSSION

It is of primary concern that personnel working in areas of radiation be aware of the exposure rates in those areas and be limited to absorbed doses that comply with NRC regulations found in Title 10, Federal Code of Regulations, Part 20. In addition, areas have been defined where personnel potentially receive various levels of radiation under accident conditions.

3.0 REFERENCES

3.1 10 CFR 20

3.2 Radiation Protection Manual, Three Mile Island Nuclear Station
(Administrative Procedure #1003).

3.3 TMI - HPP 1613

3.4 TMI - FSAR Vol. 1.

3.5 10 CFR 100

3.6 HPP 1640

4.0 EQUIPMENT

4.1 Radiation Signs

4.2 Barricade Equipment

5.0 INSTRUCTIONS

5.1 Radiation Area

- 5.1.1 A "Radiation Area" is defined as "Any area, accessible to personnel, in which there exists radiation, originating in whole or in part within licensed material at such levels that a major portion of the whole body could receive in any one hour a dose in excess of 5 millirem, or in any 5 consecutive days, a dose in excess of 100 millirems." (Ref. 3.1)
- 5.1.2 "Radiation Areas" will be posted with caution signs, acceptable to the AEC, that read: "Caution" RADIATION AREA (See Figure 1610-1)

5.2 High Radiation Area

- 5.2.1 A "High Radiation Area" is defined as "....any area, accessible to personnel, in which there exists radiation originating in whole or in part within licensed material at such levels that a major portion of the body could receive, in any one hour, a dose in excess of 100 millirem." (Ref. 3.1)
- 5.2.2 10 CFR 20 states that such an area be locked, except during periods when access to the area is required. TMI has, however, been granted an exemption to the above, allowing areas of radiation levels between 100 mrem and 1000 mrem to be barricaded and conspicuously posted as stated in step 5.2.3. In addition to this posting the Radiation Protection Department will post the area "Dose Rate Instrument Required for Entry." Areas with intensity greater than 1000 mrem/hr will have locked barricades and

be conspicuously posted as stated in step 5.2.3. In addition to this posting the Radiation Protection Department will post these areas "Dose Rate Instrument Required; Notify Radiation Protection Department Prior to Entry." Keys to these areas shall be maintained under the administrative control of the Shift Supervisor/Foreman. Verbal permission must be obtained from the Shift Supervisor and Radiation Protection Supervisor/Foreman prior to entry.

NOTE: Areas with intensity greater than 1000 mrem/hr may remain unlocked during periods when access for maintenance is required, provided positive control (1) over each individual entry is maintained. Verbal permission of Shift Supervisor and Radiation Protection Supervisor/Foreman prior to entry is not necessary for each individual entry, however, approved Radiation Work Permits as described in HPP 1613 are required.

- 5.2.3 "High Radiation Areas" will be posted with caution signs acceptable to the NRC, that read:

CAUTION

HIGH RADIATION AREA (See Figure 1610-2)

- 5.2.4 "Intermittant" Radiation Areas

A intermittant radiation area is defined as any area, accessible to personnel, that at any time due to a specific operation may become a radiation area. Therefore, during normal operations these areas may or may not be radiation areas. These areas may be posted as intermittant radiation areas, provided they

- (1) Positive control means the establishment of a control point manned by an H.P. qualified individual.

do not grossly interfere with normal access and impose undue hardships on personnel. If not posted as "Intermittant" Radiation Areas, these areas will be posted as Radiation Areas (See 5.1.2) at any time during which the levels exceed the limits specified in 5.1.1.

All "Intermittant Radiation Areas" will be treated as "Radiation Areas" regarding the need for authorized Radiation Work Permits prior to entering the area.

5.3 Radioactive Materials

- 5.3.1 In accordance with 10 CFR 20, rooms or areas containing radioactive materials in excess of 10 times the amount listed in Appendix C of the above mentioned document, and/or containing natural uranium or thorium 100 times the amount listed in Appendix C of 10 CFR 20, will have a conspicuous sign stating:

CAUTION

RADIOACTIVE MATERIALS (See Figure 1610-3)

5.4 Airborne Radioactivity

- 5.4.1 In accordance with 10 CFR 20, any room, enclosure, or operating area in which airborne radioactive materials, composed wholly or partly of licensed material, exist in concentrations in excess of the amounts specified in Appendix B, Table I, Column 1, of the above mentioned document or concentrations when averaged over the number of hours in any week during which individuals are in the area, exceed 25 percent of the amounts specified in Appendix B, Table I, Column 1, shall be conspicuously posted with a sign or signs bearing the radiation caution symbol and the words:

CAUTION

AIRBORNE RADIOACTIVITY AREA (See Figure 1610-4)

- 5.4.2 When the isotopic content of the airborne radioactive material is not known, 10 CFR 20 gives a mixed particulate

limit of 3×10^{-9} $\mu\text{Ci/ml}$. At TMI, an administrative limit is set at one tenth (.1) of this value. (i.e. 3×10^{-10} $\mu\text{Ci/ml}$.) When the mixed product airborne activity is greater than 3×10^{-10} $\mu\text{Ci/ml}$, the area should be conspicuously marked as per section 5.4.1.

5.5 Contaminated Area

- 5.5.1 At TMI, any room, enclosure, or operating area within the confines of a controlled area (5.6.4) with loose surface contamination levels greater than or equal to the following:

1000 DPM/100 cm^2 - β , γ

100 DPM/100 cm^2 - α

will be conspicuously marked:

CAUTION

CONTAMINATED AREA (Figure 1610-5)

5.6 Established Areas at TMI

5.6.1 Unrestricted Area

- 5.6.1.1 In accordance with 10 CFR 20, an unrestricted area means any area to which access is not controlled by the licensee for purposes of protection of individuals from exposure to radiation and radioactive materials, and any area used for residential quarters.

- 5.6.1.2 Exposure to personnel within an unrestricted area may not exceed 500 mrem/year.

5.6.2 Restricted Area

- 5.6.2.1 A "Restricted Area" is any area, to which access is controlled by the licensee, for purposes of protection of individuals from exposure to radiation and radioactive

materials. A "Restricted Area" will not include any area used a residential quarters; although a separate room or rooms in a residential building may be set apart as a restricted area.

5.6.3 Clean Area

- 5.6.3.1 At TMI, administrative limits for contamination levels are less than the following:

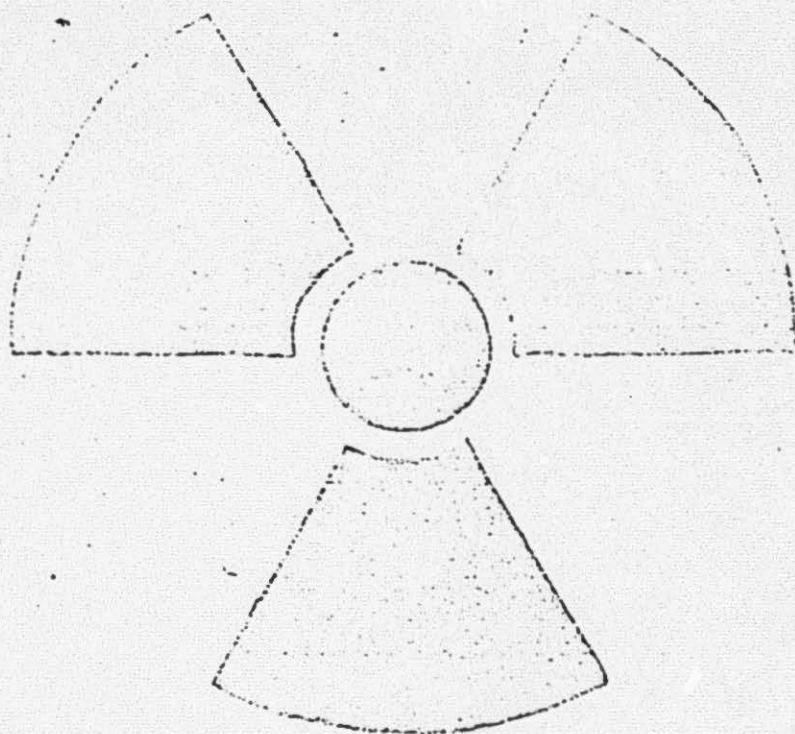
1000 DPM/100 cm² β γ

100 DPM/100 cm² Alpha

5.6.4 Control Area

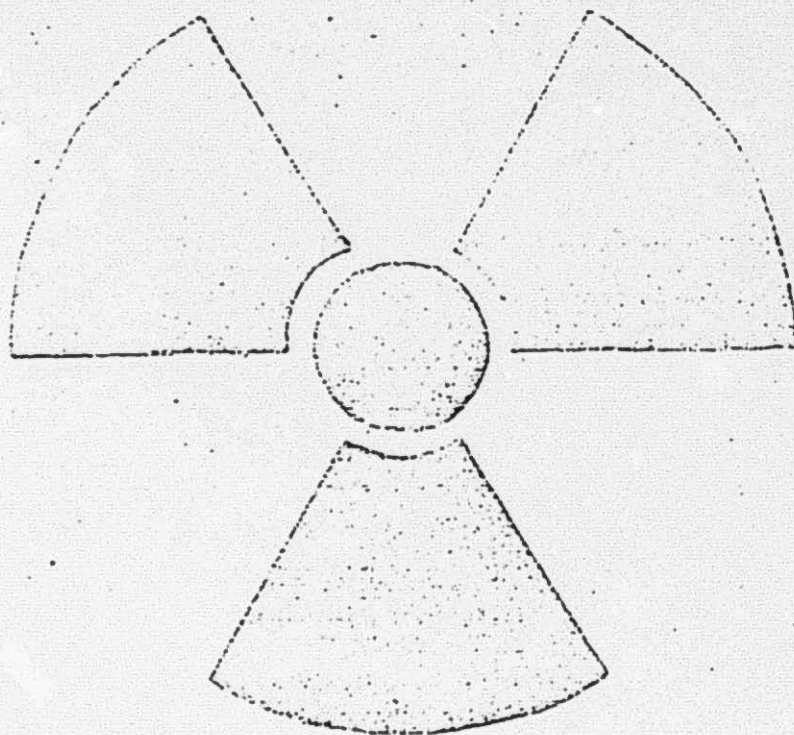
- 5.6.4.1 Within restricted areas, there are areas designated as controlled areas. These areas may contain "Radiation Areas," "High Radiation Areas," "Contaminated Areas," or rooms having been posted as containing radioactive materials or airborne radioactivity.

CAUTION



RADIATION AREA

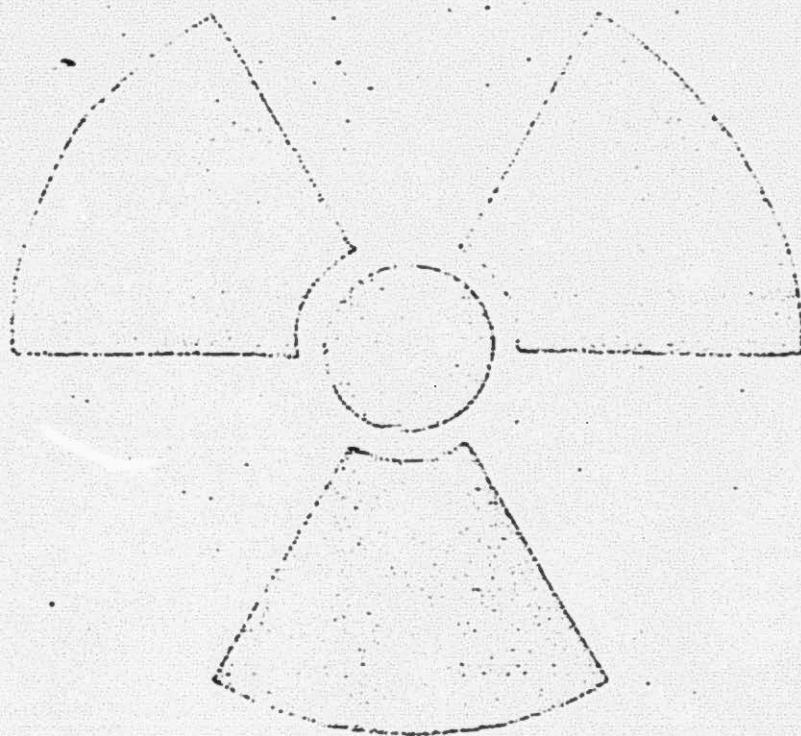
CAUTION



HIGH RADIATION AREA

189 073

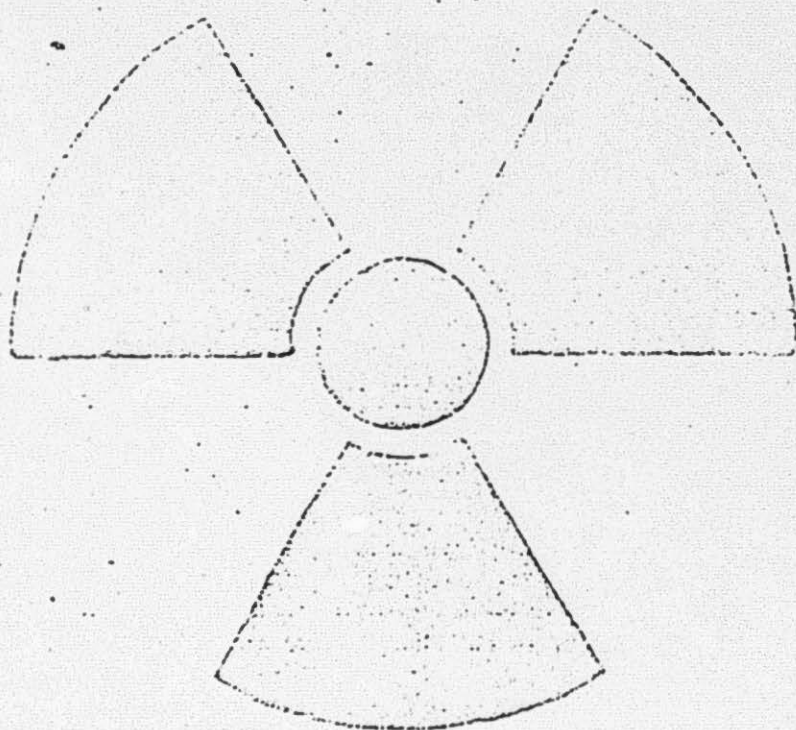
CAUTION



RADIOACTIVE MATERIALS

189 074

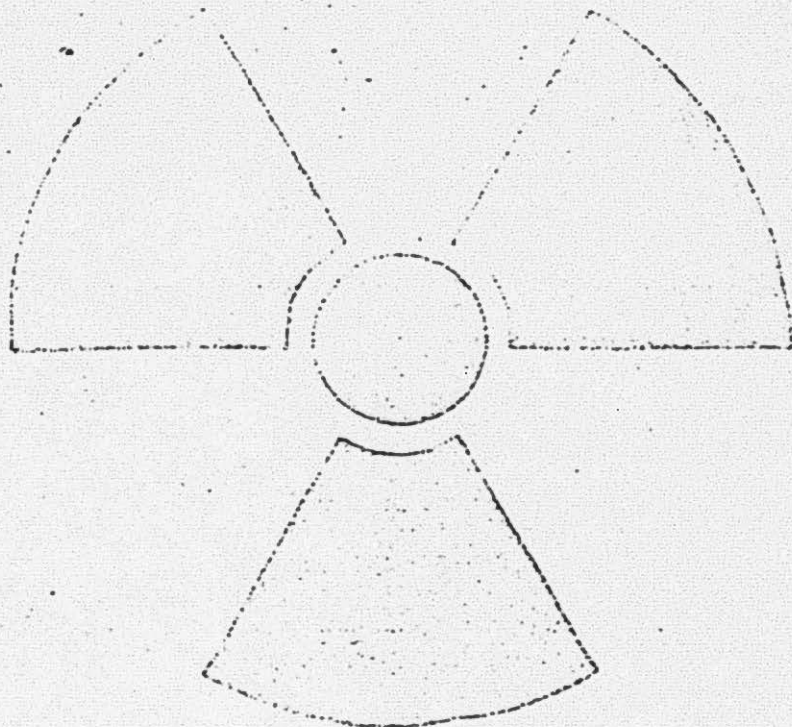
CAUTION



AIRBORNE RADIOACTIVITY AREA

189 075

CAUTION



CONTAMINATED AREA

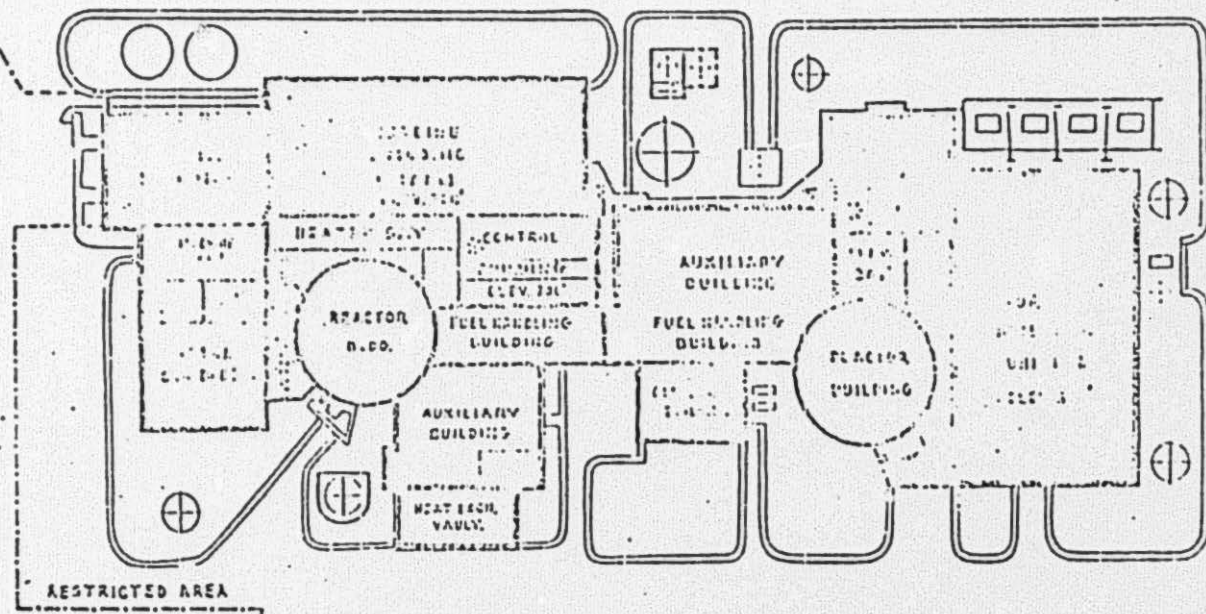
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POOR ORIGINAL

11.0

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Figure 1610-7



CLEAN AREA
 $< 1000 \text{ DPM}/100 \text{ CM}^2 \text{ B}$
 $< 100 \text{ DPM}/100 \text{ CM}^2 \text{ alpha}$

CONTROLLED AREA
 Any area with a high probability of exceeding > 1000 the limits of a clean area.

EXAMPLE OF CONTAMINATED
 $> 1000 \text{ DPM}/100 \text{ CM}^2 \text{ B}$
 $> 100 \text{ DPM}/100 \text{ CM}^2 \text{ alpha}$

* ACCESS CONTROL POINT

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TMI DOCUMENTS

DOCUMENT NO: TM-079

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METROPOLITAN EDISON COMPANY.

Wiem
Wilda R. Mullinix, NRC

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