THREE MILE ISLAND NUCLEAR STATION

STATION HEALTH PHYSICS PROCEDURE 1640

PERSONNEL DOSIMETRY, ISSUANCE, ADMINISTRATION AND RECORD KEEPING

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Unit 1 Staff Recommends Approval

Approval N/A Date _____

Cognizant Dept. Head

Unit 2 Staff Recommends Approval

Approval N/A Date

Cognizant Dept. Head

Unit 1 PORC Recommends Approval

J E Hartman Date 6/3/77

VICE Chairman of PORC

PORC comments of _____ (date) included

By _____ Date _____

Unit 2 PORC Recommends Approval

J A Marley Jr Date 6-6-77

Chairman of PORC

PORC comments of _____ (date) included

By _____ Date _____

Approval J. P. Mangan Date 6/15/77

Station Superintendent/
Unit Superintendent

TMI-55-A 11-74

THREE MILE ISLAND NUCLEAR STATION

STATION HEALTH PHYSICS PROCEDURE 1640

PERSONNEL DOSIMETRY, ISSUANCE, ADMINISTRATION AND RECORD KEEPING

1.0 PURPOSE

The purpose of this procedure is to describe the method to be utilized for the issuance, administration and record keeping of personnel dosimetry.

2.0 DISCUSSION

2.1 Personnel monitoring is the measurement of radiation exposures received by personnel.

2.2 Personnel dosimeters are issued to all personnel entering the controlled area of TMI.

2.3 Personnel dosimetry, administration and record keeping is intended to provide an accurate record of personnel exposure to insure compliance with 10 CFR 20.

2.4 This procedure is also intended to aid the Radiation Protection Personnel in monitoring personnel exposures as low as reasonably achievable (ALARA).

3.0 REFERENCES

3.1 AP 1003, Radiation Protection Manual.

3.2 10 CFR 20

3.3 Radiation Exposure Monitoring System Procedure Manual.

3.4 HPP 1641 Self-Reader Dosimeter Usage and Record Keeping

3.5 HPP 1642 Operation and Calibration of the TLD System.

4.0 EQUIPMENT

4.1 Badges

4.2 Radiation Exposure Monitoring Computer System.

4.3 Self Reader Dosimeters (Gamma, Neutron).

4.4 NRC Form-4

4.5 NRC Form-5

5.0 OPERATING INSTRUCTIONS

5.1 Issuance of Personnel Dosimeters

5.1.1 Self Reader Dosimeters

5.1.1.1 Self reader dosimeters are issued to all personnel entering the controlled area.

5.1.1.2 Low range, high range, and neutron self reader dosimeters are issued at the access control point of the discretion of the Radiation Protection Supervisor/Foreman/Rad. Chem. Tech. or as required by the Radiation Work Permit (RWP).

5.1.1.3 Records will be maintained in accordance with HPP 1641

5.1.2 Beta-Gamma TLD/Film Badge Dosimetry

5.1.2.1 Permanent Personnel

5.1.2.1.1 Permanent personnel at TMI are issued a duplicate set of TLD's with similar identification numbers. These numbers are normally 100XXX and 200XXX, to permit alternate monthly use.

5.1.2.1.2 These TLD badge numbers are permanently assigned to the individual until termination or loss.

5.1.2.1.3 TLD badges are exchanged and evaluated monthly or as required by the Radiation Protection Supervisor/Foreman in accordance with HPP 1642.

5.1.2.1.4 Film badges may be issued in addition to the TLD badge to enhance dosimetry information.

5.1.2.1.5 TLD badge exposure data will be submitted to the Radiation Protection Supervisor/Foreman for review and subsequent entry into the REM Computer System in accordance with Reference 3.3.

5.1.2.1.6 Film badges are submitted to the commercial processor after each monthly exchange for evaluation.

5.1.2.1.7 Data from film badges or self reader dosimeters, may be utilized for NRC-5 record in the event of loss of TLD information.

5.1.2.1.8 In the event of loss of all dosimetry equipment, a calculated dose will be utilized for an individual's radiation exposure record. This data will be entered in accordance with Reference 3.3.

5.1.2.2 Visitors, Contractors and Other Temporary Personnel.

5.1.2.2.1 Temporary personnel are issued the same dosimetry devices as permanent personnel with certain exceptions.

5.1.2.2.2 Temporary TLD badges are numbered 300XXX.

5.1.2.2.3 Temporary film badges, if issued, are issued only for the time spent on site, but not to exceed one (1) month.

5.1.2.2.4 Temporary TLD badges are issued only for the time spent on site, but not to exceed one (1) month unless authorized by the Radiation Protection Supervisor/Foreman.

5.1.2.2.5 Normally all temporary badges will be picked up at the time of the monthly badge exchange, and will be reissued as required.

5.1.3 Neutron TLD's/Neutron Film Badges

5.1.3.1 A neutron TLD and or neutron film badge will be required for all personnel entering the reactor containment while the reactor is at power.

5.1.3.2 Neutron TLD/Neutron film badge dosimetry is collected at the end of each wear period and processed in the same manner at Beta Gamma Dosimetry.

5.1.3.3 Neutron TLD data is automatically processed by the REM Computer System in a manner similar to the gamma exposure.

5.1.4 In the event any personnel dosimetry is lost, Radiation Protection Personnel must be notified to complete Sections A, C and D of the Contaimination/Exposure Report (Form 1612-1).

5.2 Dosimetry Forms

5.2.1 NRC - Form 4 (Form 1770-1) If it is necessary to expose an individual over 1.25 rem per quarter, but not to exceed 3 rem per quarter, the following NRC Form 4 is required. Complete this form as follows:

NOTE: In addition to the NRC Form 4, part A of Figure 1.3 of Reference 3.1 must be completed. Part B must be completed to exceed 2.5 rem per quarter.

5.2.1.1 Line 1 - print or type name (last - first - middle).

5.2.1.2 Line 2 - individual's social security number.

5.2.1.3 Line 3 - date of birth (month - day - year).

5.2.1.4 Line 4 - age in full years.

5.2.1.5 Line 5 - list the name and address of each previous employer and the address of employment. Start with the most recent employer and work back. Only periods since the 18th birthday should be included. If self-employed, insert the word "self-employed".

5.2.1.6 Line 6 - give dates of employment.

5.2.1.7 Line 7 - list periods during which occupational exposure to radiation occurred.

5.2.1.8 Line 8 - list the dose recorded for each period of exposure from records of previous occupational exposure of the individual.

5.2.1.9 Line 9 - after each entry in line 8, indicate in line 9 whether dose is obtained from records or calculated.

5.2.1.10 Line 10 - list any remarks.

5.2.1.11 Line 11 - the total for the whole body is obtained by summation of all values in line 8.

5.2.1.12 Line 12 - upon completion of the report, the employee must certify that the information in columns 5, 6 and 7 is accurate and complete to the best of his knowledge. The date is the date of his signature.

5.2.1.13 Line 13 - the life time accumulated occupational dose for each individual and the permissible dose are obtained by carrying out the following steps: The value for N should be taken from Item 4. Subtract 18 from N and multiply the difference by 5 rem. (For example, John Smith, age 32, N=32, PAD=5 (32-18)=70 rem. Enter total exposure to date from Item 11. Subtract (b) from (a) and enter the difference under (c). The value in (c) represents the unused part of the permissible accumulated dose. This value for permissible does is to be carried forward to Form NRC-5, "Current Occupational External Radiation Exposure (Whole Body)".

5.2.1.14 Line 14 - enter the name that appears on the Operation License.

5.2.2 NRC Form-5.

5.2.2.1 After entry of all data for the previous year into the REM Computer System, an equivalent individual NRC Form-5 for each individual is printed by the REM Computer System in accordance with Reference 3.3.

5.2.2.2 After review, this form is filed in each individual's dosimetry file.

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Form approved.
Bureau of Budget No. 38-R119.1.

U.S. ATOMIC ENERGY COMMISSION

OCCUPATIONAL EXTERNAL RADIATION EXPOSURE HISTORY

See Instructions on the Back

IDENTIFICATION

1. NAME (PRINT—LAST, FIRST, AND MIDDLE)	2. SOCIAL SECURITY NO.
3. DATE OF BIRTH (MONTH, DAY, YEAR)	4. AGE IN FULL YEARS (N)

OCCUPATIONAL EXPOSURE—PREVIOUS HISTORY

5. PREVIOUS EMPLOYMENTS INVOLVING RADIATION EXPOSURE—LIST NAME AND ADDRESS OF EMPLOYER	6. DATES OF EMPLOYMENT (FROM—TO)	7. PERIODS OF EXPOSURE	PREVIOUS DOSE HISTORY	
			8. WHOLE BODY (DE=)	9. RECORD OR CALCULATED (INDICATE ONE)

10. REMARKS

11. ACCUMULATED OCCUPATIONAL DOSE—TOTAL

12. CALCULATIONS—PERMISSIBLE DOSE

WHOLE BODY:

(A) PERMISSIBLE ACCUMULATED DOSE = N(N−18) = _____ REM

(B) TOTAL EXPOSURE TO DATE (FROM ITEM 11) = _____ REM

(C) UNUSED PART OF PERMISSIBLE ACCUMULATED DOSE (A−B) = _____ REM

13. CERTIFICATION: I CERTIFY THAT THE EXPOSURE HISTORY LISTED IN COLUMNS 5, 6, AND 7 IS CORRECT AND COMPLETE TO THE BEST OF MY KNOWLEDGE AND BELIEF.

EMPLOYEE'S SIGNATURE _____ DATE _____

14. NAME OF LICENSEE

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INSTRUCTIONS FOR PREPARATION OF FORM AEC-4

This form or a clear and legible record containing all the information required on this form must be prepared by each licensee of the Atomic Energy Commission who, pursuant to Section 20.101, proposes to expose an individual to a radiation dose in excess of the amounts specified in Paragraph 20.101(a) of the regulations in Part 20, "Standards for Protection Against Radiation," 10 CFR. The requirement for completion of this form is contained in Section 20.102 of that regulation. The information contained in this form is used for estimating the external accumulated occupational dose of the individual for whom the form is completed. A separate Form AEC-4 shall be completed for each individual to be exposed to a radiation dose in excess of the limits specified in Paragraph 20.101(a) of Part 20 of the Commission's regulations.*

Listed below by item are instructions and additional information directly pertinent to completing this form:

Identification

Item 1. Self-explanatory.

Item 2. Self-explanatory except that, if individual has no social security number, the word "none" shall be inserted.

Item 3. Self-explanatory.

Item 4. Enter the age in full years. This is called "N" when used in calculating the Permissible Dose. N is equal to the number of years of age of the individual on his last birthday.

Occupational Exposure

Item 5. List the name and address of each previous employer and the address of employment. Start with the most recent employer and work back.

Include only those periods of employment since the eighteenth birthday involving occupational exposure to radiation. For periods of self-employment, insert the word "self-employed."

Item 6. Give the dates of employment.

Item 7. List periods during which occupational exposure to radiation occurred.

Item 8. List the dose recorded for each period of exposure from records of previous occupational exposure of the individual as calculated under Section 20. Dose is to be given in rem.

"Dose to the whole body" shall be deemed to include any dose to the whole body, gonads, active blood-forming organs, head and trunk, or lens of eye.

Item 9. After each entry in Item 8 indicate in Item 9 whether dose is obtained from records or calculated in accordance with Section 20.102.

Item 10. Self-explanatory.

Total Accumulated Occupational Dose (Whole Body)

Item 11. The total for the whole body is obtained by summation of all values in Item 8.

Certification

Item 12. Upon completion of the report, the employee must certify that the information in Columns 5, 6, and 7 is accurate and complete to the best of his knowledge. The date is the date of his signature.

Calculations

Item 13. The lifetime accumulated occupational dose for each individual and the permissible dose under Paragraph 20.101(b) are obtained by carrying out the following steps: The value for N should be taken from Item 4. Subtract 18 from N and multiply the difference by 5 rem. (For example, John Smith, age 32; N = 32, PAD = 5(32 − 18) = 70 rem.) Enter total exposure to date from Item 11. Subtract (b) from (a) and enter the difference under (c). The value in (c) represents the unused part of the permissible accumulated dose. This value for permissible dose is to be carried forward to Form AEC-5, "Current Occupational External Radiation Exposure (Whole Body)."

Item 14. Self-explanatory.

*This form requires the signature of the employee concerned.

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CONTAMINATION/EXPOSURE REPORT

☐ LOSS OF PERSONAL DOSIMETRY ☐ PERSONNEL CONTAMINATION

Name_____ Company_____

SS#_____ Date_____ Time_____

Address (If not Met-Ed)_____

_____

A. LOSS OF PERSONAL DOSIMETRY

Section 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 area: Yes_____ No_____

B. PERSONNEL CONTAMINATION:

1.

Contaminated Body Areas	Survey Results Highest DPM

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PERSONNEL CONTAMINATION: (Cont'd)

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: H.P. Lab
Manager-Gen. Operations-Nuclear
Unit Superintendent
Supv.-Rad. Prot. and Chemistry
Safety Representative
Individual's Supervisor

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TMI DOCUMENTS

DOCUMENT NO: TM-091

COPY MADE ON 5/4/79 OF DOCUMENT PROVIDED BY METROPOLITAN EDISON COMPANY.

Wilda R. Mullinix, NRC

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