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RISK MANAGEMENT DIVISION
ENVIRONMENTAL, SAFETY & OCCUPATIONAL HEALTH BRANCH
TOBYHANNA ARMY DEPOT
TOBYHANNA, PA 18466-5040

Standard Operating Procedure
SOP No. 04-10

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PROCEDURE FOR MEASUREMENT OF RADON

	<u>PARAGRAPH</u>	<u>PAGE</u>
Purpose -----	1	1
Policy -----	2	1
References -----	3	1
Definitions -----	4	2
Measurement Strategy -----	5	2
Device Location -----	6	3
Priority of Facility Types -----	7	3
Mitigation Action Times -----	8	3
Proper Use of Sun Nuclear Model 1028 -----	9	4
Closed Building Conditions-----	10	5
Documentation -----	11	5

1. Purpose. This Standard Operating Procedure (SOP) presents a measurement strategy for assessing radon levels in buildings on Tobyhanna Army Depot (TYAD) for the purpose of determining the need for remedial action.

2. Scope. The provisions of this SOP apply to all personnel performing radon measurements and radon mitigation on TYAD.

3. References.

a. Department of the Army Pamphlet (DA PAM) 200-1, Environmental Protection and Enhancement

b. Army Regulation (AR) 750-43, Army Test, Measurement and Diagnostic Equipment (TMDE)

c. TYAD Regulation 385-9, Radiation Safety Program

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4. Definitions.

- a. Building. Any structure with four walls, a roof and a finished floor.
- b. Long-Term Test. A test conducted for a period longer than 90 days.
- c. pCi/l. Picocuries Per Liter – unit for volumetric activity concentration of radon in the air.
- d. Radon. refers to the isotope Radon-222 (Rn-222) and its decay products.
- e. Remediation. The act of correcting a problem, i.e., high levels of radon.
- f. Short-Term Test. A test conducted from two to 90 days.

5. Measurement Strategy.

a. Every permanent occupiable building on TYAD is required to undergo radon testing for the purpose of determining the need for remediation.

b. Measurements will be made with a Sun Nuclear Model 1028 Continuous Radon Monitor (CRM) or other appropriate radon detection device in “Active” calibration in accordance with AR 750-43.

c. Short-Term Test (STT)

(1) All initial radon testing performed on TYAD will be a STT.

(2) STTs will be conducted for three to seven consecutive days.

(3) STTs should be conducted under Closed-Building Conditions (CBCs), to the extent possible. CBCs are defined in Paragraph 10 below.

(4) If the result of the initial STT is less than 3.0 pCi/L then no additional testing or remediation is required.

(5) If the result of the initial STT is greater than 3.0 pCi/L but less than 8.0 pCi/L then an additional STT is required. The results of both STTs will be averaged to determine a final concentration. If the final concentration is above 4.0 pCi/L a Long Term Test (LTT) will be initiated.

(6) If the result of the initial STT is greater than 8.0 pCi/L a long term test will be initiated.

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d. LTT

(1) LTTs will be conducted for no less than 90 consecutive days.

(2) Measurement intervals will be set to four hours to ensure 90 days of continuous measurements are recorded.

e. Follow up measurements should be conducted in buildings that have undergone mitigation at least every five years.

f. Mitigation action times will be determined by Paragraph 8 below.

6. Device Location.

a. Measurement devices will be placed in the lowest occupied area of a building.

b. Devices are to be placed away from drafts caused by heating, ventilation, air conditioners and fans.

c. Measurement location should be at least two feet above the floor, and three feet from doors, windows and other potential openings to the outdoors.

7. Priority of Facility Types.

a. Buildings will be scheduled for radon testing using the following criteria:

(1) Priority 1 - Daycare centers, hospitals, schools, living quarters.

(2) Priority 2 - All areas having 24-hour operations.

(3) Priority 3 - All other routinely occupied buildings.

8. Mitigation Action Times.

a. If radon concentration is ≥ 200 pCi/l, initiate mitigation within one month unless occupants are relocated to another area.

b. If radon concentration is < 200 pCi/l but ≥ 20 pCi/l, initiate mitigation within six months.

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- c. If radon concentration is < 20 pCi/l but ≥ 8 pCi/l, initiate mitigation within one – four years.
- d. If radon concentration is < 8 pCi/l but ≥ 4 pCi/l, initiate mitigation within five years.
- e. If radon concentration is < 4 pCi/l no mitigation is required.

9. Proper use of Sun Nuclear Model 1028.

a. The Sun Nuclear Model 1028 is a CRM used to measure the concentration of radon gas.

b. This radon monitor should never be used in environments containing explosive gas. A spark from inside the CRM could ignite the gas.

c. The Model 1028 can record up to 720 continuous measurements. Measurement Intervals will be set to appropriate time intervals to ensure continuous measurements are recorded.

d. Preparing the Sun Nuclear Model 1028 for measurements.

(1) Ensure the Model 1028 is equipped with a nine-volt battery. The unit will not function without this battery.

(2) Plug the Model 1028 into the nearest 120V outlet to ensure continuous measurements. The backup battery only lasts for 100 hours.

(3) To activate the display press the “ON” button (#5) for several seconds. The display should read “Battery OK”.

(4) Enter Pin number to access machine. Only persons authorized to perform radon measurements will be given Pin access.

e. With the display reading “Start Test = 5” press:

(1) “1” to verify unit status. Check for Interval and Duration settings.

(2) “2” to enter machine setup. Set Interval and Duration to desired setting. Ensure Model 1028 is setup to record in pCi/l.

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