

**WORCESTER POLYTECHNIC INSTITUTE
HEALTH PHYSICS PROCEDURE HP-01
AREA MONITORS AND POOL LEVEL MONITOR CALIBRATION**

1. PURPOSE

To ensure that the area monitors are in proper calibration and to ensure that the pool level monitor trip is within the Technical Specification limit.

2. FREQUENCY

This procedure shall be performed quarterly.

3. MATERIALS, TOOLS, AND EQUIPMENT

3.1. Form(s):

3.1.1. Area Monitors and Pool Level Monitor (Form_1)

3.1.2. Area Monitor Calibration (Area_Mon.WK4)

3.2. Source assembly

3.3. Source holder

3.4. Gamma radiation source (i.e.: Cs-137, Co-60, etc.)

3.5. Meter stick or another appropriate instrument

4. PRECAUTIONS:

4.1. The Radiation Safety Officer or a Senior Reactor Operator shall supervise the performance of this procedure.

4.2. Call campus security, inform them that the radiation alarms will be tested.

4.3. Disable the building evacuation alarms.

4.3.1. Obtain the key to the Evacuation Alarm Control box from the key locker.

- 4.3.2. Open the box, move the Alarm Bypass Switch to the Bypassed position.
- 4.3.3. Depress the Trouble Silenced button to silence the alarm.
- 4.4. Ensure that all appropriate health physics precautions are followed throughout the procedure.
- 4.5. Utilize the concepts of time, distance, and shielding to maintain exposure as low as reasonably achievable.

5. INSTRUCTIONS:

5.1. Area Monitor Calibration

- 5.1.1. Calculate the distance that will produce each dose rate given on the form (as measured between the geometric center of the detector and the front of the radiation source).
- 5.1.2. Calibrate each of the area monitors implementing the following steps:

NOTE: For convenience, this procedure should be performed by two individuals: one located at the console and one located at the detector.

- 5.1.2.1. Attach the source assembly to the detector.
- 5.1.2.2. Carefully remove the radiation source from its shielding using the source holder.
- 5.1.2.3. Attach the source holder to the assembly.
- 5.1.2.4. Position the radiation source to the first distance calculated in step 5.1.1.
- 5.1.2.5. Wait for a stabilized reading.
- 5.1.2.6. Record the reading indicated on the area monitor display located on the console.
- 5.1.2.7. Compare this reading to the expected dose rate.
- 5.1.2.8. Refer to the area monitor instruction manual if any adjustments are necessary.

5.1.2.9. Repeat this step for each distance calculated.

5.2. Pool Level Monitor Calibration

5.2.1. Using a meter stick or another appropriate instrument, depress the bottom float in the pool until the pool water level monitor trips. The trip will be indicated by an audible alarm and the appearance of a red light on the Evacuation Alarm Control Box.

5.2.2. Remove the instrument from the pool.

5.2.3. Measure the water level indicated.

5.2.4. Reset the pool water level monitor.

5.2.4.1. Return the float to its proper position.

5.2.4.2. Depress the system reset button on the Evacuation Alarm Control Box.

5.2.5. Measure the distance between the pool surface and the bottom of the pool overflow pipe.

5.2.6. Add the measurements in steps 5.2.1. and 5.2.5.; record this value on the form.

6. RESTORATION

6.1. Enable the building evacuation alarms.

6.1.1. Open the Evacuation Alarm Control box.

6.1.2. Depress the System Reset button to reset the system.

6.1.3. Return the Alarm Bypass Switch to the Normal position.

6.1.4. Depress the Trouble Silenced button to silence the alarm.

6.1.5. Lock the box, return the key to the key locker.

6.2. Call campus security, inform them that the test of the radiation alarms has been completed.

7. REFERENCES

- 7.1. Victoreen Instruction Manual
- 7.2. Code of Federal Regulations Part 10, Chapter 20
- 7.3. Radiation, Health and Safeguards Committee Radiation Regulations
- 7.4. Worcester Polytechnic Institute's Technical Specifications