



RADIATION
SOLUTIONS

Operating a Radiation Survey Meter



Step 1: Damage Check



1. Check for any damage

Step 2: Calibration Validity

CALIBRATION PER NRC REGULATION 10-CFR-34 & 10-CFR-35
Calibrated by B. Perego on 02/10/16
Calibration void after 02/10/17
Meter s# 4753 Detector s# INTGM
Sources Used Cs-137
Battery Check Sat. Check Source N/A
Detector Angle Perpendicular to the field
Correction Factor N/A ± 10%
Notes: mR/h
Notes: _____

1. Check for any damage
2. **Verify validity of calibration**

Step 3: Battery Check



1. Check for any damage
2. Verify validity of calibration
- 3. Check battery condition**

Step 4: Verify Detector Operability

Add Video

1. Check for any damage
2. Verify validity of calibration
3. Check battery condition
- 4. Verify detector operability using an exempt quantity check source**



Step 5: Verify Instrument Setup Configuration

DIGITAL METERS



1. Check for any damage
2. Verify validity of calibration
3. Check battery condition
4. Verify detector operability using an exempt quantity check source
- 5. Verify instrument setup configuration**

Step 5: Verify Instrument Setup Configuration



ANALOG METERS

1. Check for any damage
2. Verify validity of calibration
3. Check battery condition
4. Verify detector operability using an exempt quantity check source
- 5. Verify instrument setup configuration**

Fluctuating Analog Meter
Display Video with audio
on, fast response, at
background levels.

Fluctuating Analog Meter
Display Video with audio
on, higher level activity,
slow response for more
uniform measurement.

1. Fluctuating readings are normal
2. Fluctuations reflect the random nature of radioactive decay
3. As the radioactivity or radiation level increases, the instrument is able to make a better evaluation and you see less fluctuation

Reading an Analog Radiation Meter



Which meter scale is correct?

What do all these switches mean or do?

Seems like it's very complicated !

Reading an Analog Radiation Meter



Good Battery Test Range

Top Scale

- Range: 0 to 4200
- Units: CPM (counts per minute)
- Scale Type: Linear

Mid Scale

- Range: 0 to 2
- Units: mR/hr (milli-Roentgens per hour)
- Scale Type: Linear

Lower Scale

- Range: 0 to 2
- Units: mR/hr (milli-Roentgens per hour)
- Scale Type: Logarithmic

Reading an Analog Radiation Meter



1. Look at the chosen scale and measurement units on the meter face
2. Determine the value pointed to by the needle
3. Multiply the meter value by the selector times value

Reading an Analog Radiation Meter



Step 1

- a) Upper Scale: 0 to 4,000
- b) Scale Units: CPM (counts per minute)
- c) Needle Value: 1300

Step 2

- a) Range Switch Position: X10

Step 3

- a) Multiply $1300 \times 10 = 13,000$

Reading an Analog Radiation Meter: Test 1



Which is the correct measurement value?

- a) 500
- b) 25
- c) 250
- d) 2.5

Reading an Analog Radiation Meter: Test 1



Which is the correct measurement value?

- a) 500
- b) 25 mR/hr**
- c) 250
- d) 2.5

X100 Range must use the bottom scale
Multiply 0.25 by 100
Answer: 25 mR/hr

Reading an Analog Radiation Meter: Test 2



What is the correct measurement?

- a) 2000 CPM
- b) 500 Volts
- c) 0.2 mR/h
- d) 20 mRem/h

Reading an Analog Radiation Meter: Test 2



What is the correct radiation measurement?

- a) 2000 CPM
- b) 500 Volts
- c) 0.2 mR/h**
- d) 20 mRem/h

Measurement Units: mR/h

Scale: upper (*bottom scale is for measuring High Voltage*)

Range selector: X1

Answer: $0.2 \times 1 = 0.2$ mR/h

Reading an Analog Radiation Meter: Test 3



Which is the correct answer for the ASP-1 with the SPA-8 detector?

- a) 3,800 $\mu\text{R/h}$
- b) 38,000 $\mu\text{R/h}$
- c) 3.8K CPM
- d) 9,500 $\mu\text{R/h}$

Reading an Analog Radiation Meter: Test 3



Which result measurement is the correct answer for the ASP-1 with the SPA-8 scintillator detector?

- a) **3,800 $\mu\text{R/h}$**
- b) 38,000 $\mu\text{R/h}$
- c) 3.8K CPM
- d) 9,500 $\mu\text{R/h}$

Measurement Units: $\mu\text{R/h}$ (*micro-R per hour*)

Scale: upper (*bottom scale is for measuring High Voltage*)

Range selector: X10K (*10,000*)

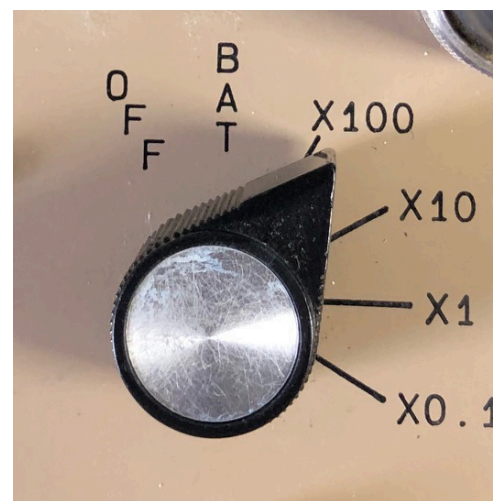
Answer: $0.38 \times 10,000 = 3,800 \mu\text{R/h}$

Selecting the Proper Scale

VIDEO 1 – MOVING UPSCALE

VIDEO 2 – MOVING
DOWNSCALE

VIDEO 3 – FINDING THE RIGHT
SCALE



Ranger startup and
measurement reading.

Conclusion



This completes this section.
Proceed to the next one when you are ready.



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