RCT/HPT Site Standard OJT Program

OJE Evaluator Reference

Course Number: **022302**

Course Title: RCT/HPT OJT/OJE Task – Dose Rate Meter Operation

Task Title: Dose Rate Instrument

Form(s) N/A

Terminal Objective: Demonstrate use of Dose Rate Meter

Objectives – Part A	
Method	**Task**
D	Identify the number and type(s) of detectors and windows *RO-3B:* *1 – Air filled Ion Chamber* *1 – mylar beta window* *RO-3B (Bumble Bee):* *1 – Air filled Ion Chamber* *1 – polycarbonate beta window (6 mg/cm2)* *1 – mylar alpha window (1 mg/cm2)* *RO-3B (Black Widow):* *1 – Air filled Ion Chamber* *1 – polycarbonate beta window (6 mg/cm2)* *1 – mylar alpha window (1 mg/cm2)* *RO-20:* *1 – air filled ion chamber* *2 Layer – mylar beta window*

Objectives – Part A	
Method	**Task**
	RSO-50E: *1 – air filled ion chamber* *1 - mylar beta window* *MicroRem:* *1 - Organic Scintillator,* *no window on regular versions, thin polycarbonate window on low energy version*
D	State the density thickness of the chamber wall, beta shield, and window. *RO-3B:* *400 mg/cm^2 chamber wall* *400 mg/cm^2 beta shield* *7 mg/cm^2 beta window* *RO-3B: (Bumble Bee)* *400 mg/cm^2 chamber wall* *400 mg/cm^2 beta shield* *6 mg/cm^2 beta window* *1 mg/cm^2 alpha window* *RO-3B: (Black Widow)* *400 mg/cm^2 chamber wall* *400 mg/cm^2 beta shield* *6 mg/cm^2 beta window* *1 mg/cm^2 alpha window* *RO-3B: (Paraffin Wrapped)*

Objectives – Part A	
Method	**Task**
	1000 mg/cm^2 chamber wall *1000 mg/cm^2 beta shield* *7 mg/cm^2 beta window* *RO-20:* *1000 mg/cm^2 chamber wall beta shield* *7 mg/cm^{2}beta window (2 layers)* *RSO-50E:* *1000 mg/cm^2 chamber wall and beta shield* *7 mg/cm^{2}beta window* *MIcroRem: Tissue equivalent*
D	State which types of radiation can be detected and measured. *RO-3B:* *Beta and photon detected and measured* *RO-3B: (Bumble Bee)* *Beta, Photon, alpha detected and measured* *RO-3B: (Black Widow)* *Beta, Photon, alpha detected and measured* *RO-20:* *Beta and photon detected and measured*

Objectives – Part A	
Method	**Task**
	RSO-50E: *Beta and photon detected and measured* *MicroRem:* *Gamma*
D	Explain the reasons for using correction factors. *Correct for geometry, Temperature, and energy of source radiation due to differences between use and calibration.* *Convert measured to actual* *MircoRem readings not corrected*
D	Identify the useful ranges of the instruments. *RO-3B, and Bumble Bee: 0 – 5000 mR/hour* *RO-3B (Black Widow): 0-500 R/hour* *RO-20: 0-50 R/hour* *RSO-50E: 0 – 50 R/hour* *MicroRem: >20 – 20,000 uRem/hour*
D	State the equation used for deep dose rate and shallow dose rate calculations. *DDR = CW x CF_{Gamma} + neutron* *SDR = (OW – CW)CF_{Beta}+CW x CF_{Gamma} + neutron* *(WCH) Meter reading - OW for beta, CW for gamma*

Objectives – Part A	
Method	**Task**
D	State the precautions and limitations of the instruments *May under respond or fail to respond in cold temperatures* *Sensitive to temperature shock, allow instruments to acclimate for up to ~1 hr. prior to use.* *May be affected by high electromagnetic fields such as generators, avoid using around such items if possible* *Avoid contact between the instruments and other objects.* *Besides possible instrument contamination, pressure on the thin window will cause false and erratic meter reading (from capacitive effects) and might puncture or rupture the window.* *If metal case contacts other metal objects, the reading may suddenly drop to zero (with recovery after a short delay)*
D	Explain the reason for obtaining both closed and open window readings. *Determine deep dose and shallow dose rates* for comparisons against limits

Objectives – Part B	
Method	**Task**
P	Given a dose rate instrument and a meter reading, interpret the reading.
P	Given a correction factor chart and readings, calculate corrected readings.
P	Perform shallow dose and deep dose calculations.