

Interactive Radiation Demonstration for CAB

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3/15/2011



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Radiological Detection Instruments

- Two basic types
 - Radiation Survey Instruments
 - Contamination Survey Instruments
- Radiation Dosimetry
 - Thermoluminescent Dosimeters
 - Electronic Dosimeters
- Specialized Rad Instrumentation



Purpose of Survey Instruments

- Survey instruments can:
 - Easily and accurately measure radiation and contamination
 - Help evaluate radiological hazards
- Two basic types of survey instrumentation
 - Contamination Survey Instruments
 - Radiation Survey Instruments
- Personal Dosimeters
 - TLD
 - Electronic Dosimeter



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Basic Theory and Construction

- Ionizing radiation interacts with detector material and produces a meter reading



- In some instruments, the detector and meter are housed in one unit



- In other instruments, the detector is connected to the meter by a cable



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Contamination Survey Instruments

- Typically read in counts per minute (CPM)
- Not designed for measuring radiation exposure
- Locating contamination on personnel and equipment
- Determining the effectiveness of decontamination
- Verifying contamination control boundaries
- Determining the extent and magnitude of a contaminated area



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Radiation Exposure Survey Instruments

- Typically read in milliroentgen/hour (mR/hr) or roentgen/hour (R/hr)
- Best suited for use when entering a field of radiation
- Establishing control zone boundaries
- Controlling personnel exposure
- Locating sources of radiation



Shelter Radiation Kit of Materials (CD V-777-1)

1 CD V-700 Geiger counter (0-50 mr/hr) 1 CD V-715 Survey meter (0-500 r/hr)
2 CD V-742 Dosimeter (0-200 r) 1 CD V-750 Dosimeter charger



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Other Radiological Instruments

- More advanced type of radiation detection device used for the detection and identification of radioisotopes
- With proper training, users can search, measure, and identify nuclides for risk assessment



RadEye G/G-10



RadEye AB100



RadEye Area Monitor



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Radiation Dosimetry

- Electronic dosimeter:
 - Measures accumulated dose
 - Utilizes digital readout
 - Many options available
 - Audible response - chirp rate varies with radiation dose rate
- Thermoluminescent dosimeter (TLD):
 - Measures accumulated dose
 - Does not provide on-the-spot indication of dose
 - Specialized equipment required to "read" TLD



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Personal Protective Equipment (PPE)

- **Purpose of using PPE**
- **Factors that determine PPE usage**
- **Proper donning and doffing procedures**



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Factors to consider when assigning PPE

- **Knowledge and experience**
- **Changes in dose rates**
- **Equipment changes**
- **Personnel location**
- **Heat stress**
- **Water resistant/waterproof protection**
- **Sharp objects**



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Donning PPE

- **Canvas shoe covers**
- **Coveralls**
- **Supplemental dosimetry**
- **Overshoes**
- **Gloves**
- **Hood**
- **Respiratory equipment**



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Removing PPE

- **Rubber overshoes**
- **Outer gloves**
- **Hood**
- **All exposed tape**
- **Supplemental dosimetry**
- **Coveralls**
- **Canvas shoe covers**
- **Surgical gloves**



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