



Radiation Protection Training to Qualify as an Authorized User with Microcurie Amounts of Am-241 Sources 4-Hours

SYLLABUS

PRESENTED BY:

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INTRODUCTION

- HISTORY OF RADIATION DISCOVERY
- RADIATION FUNDAMENTALS
 - Sources of Radiation
 - Natural
 - Man-Made
 - External
 - Internal
 - Ionizing
 - Non-ionizing
- ATOMIC STRUCTURE
 - Atom
 - Nucleus
 - Proton
 - Neutron
 - Electron
 - Photons
 - Atomic Number
 - Mass Number
 - Atomic Weight
- CHARACTERISTICS OF RADIOACTIVE MATERIALS
 - Unstable
 - Detectable
 - Spontaneous Emission
- EMISSIONS FROM RADIOACTIVE MATERIALS

- Alpha
- Beta
- Gamma
- Neutron
- X-RAYS FROM THE ATOM
- RADIOACTIVITY
 - Disintegrations
 - Disintegration Per Unit Time (dps, dpm)
 - Curie
 - Becquerel
 - Total Activity
 - Specific Activity
- HALF-LIFE
 - Concepts
- INTERACTIONS OF RADIATION WITH MATTER
 - Interactions
 - Non-ionizing
 - Ionizing
 - Units
 - Becquerels
 - Roentgen
 - RAD
 - Weighing Factors
 - REM
- EXPOSURE RATES AND DOSE RATES
- RADIATION BIOLOGY
 - Sources of Dose
 - External
 - Internal
 - Types of Dose
 - Acute
 - Fractionated
 - Chronic
 - Types of Effects
 - Somatic
 - Genetic
- VARIABLES IN DOSE EFFECTS
 - Dose
 - Critical Organ
 - Type of Radiation
 - Individual Biological Variations



- Radiosensitivity/Radioresistancy
- **BIOLOGICAL EFFECTS**
 - Damage to Cell
 - Damage to Organs (Acute Dose)
- **RISKS**
 - Define Risk
 - Examples of Other Types of Risk Compared to Radiation Dose
- **RADIATION PROTECTION**
 - Principles of Exposure Control
 - Time
 - Distance (inverse square law)
 - Shielding
 - ALARA
 - Sealed Source vs. Contamination
 - Signs & Labels
 - Personnel Monitoring Devices
 - OSLDs/Film Badges
 - Pocket Dosimeters
 - Control Zones and Definitions

RADIATION PROTECTION MANUAL

- **CORPORATE POLICY**
- **RESPONSIBILITIES**
 - Radiation Safety Officer
 - Authorized User
- **DESCRIPTION OF RADIOACTIVE MATERIALS ON-SITE**
 - Sealed Sources
 - TRAINING REQUIREMENTS
- **RADIATION PROTECTION STANDARDS**
 - Visitors
 - Definition of Radiation Controlled Area
- **RADIATION EXPOSURE CONTROL**
 - Occupational Worker vs. Non-occupational Worker
 - ALARA
 - Annual ALARA Review
- **PERSONNEL MONITORING**
 - Not required
- **INSTRUCTIONS FOR HANDLING SOURCES**
 - Receipt Records
 - Inventory
 - User Training



- Leak Testing (initial only)
- Posting Required
- Emergency Procedures
- Servicing
- Security
- Storage
- Disposal

- REGULATORY REQUIREMENTS
 - REGULATORY AGENCY
 - RADIOACTIVE MATERIALS LICENSE
 - Radioactive Materials Authorized
 - Authorized Use
 - Authorized Users
 - Conditions of Use
 - Location
 - Inventory
 - Record keeping Requirements
 - REGULATIONS
 - Labeling, Marking
 - Exposure Control
 - ▶ Occupational Worker
 - ▶ Non-Occupational Worker (Public)
 - ▶ Medical Dose Exemption
 - Transfer, Release, Disposal
 - Transportation
 - Personnel needing training
 - Shipping as Limited Quantity only