

COURSE SCHEDULE

Radiation Safety Officers Training

- 8:00 AM Welcome and Introductions
- 8:30 AM Introduction to Radiation
Definition of Terms
Periodic Properties of Elements
Early Models of Atomic Structure
Bohr Atom
Isotopes
Environmental Radiation
Cosmic
Terrestrial
Man-made Radiation
Consumer Products
- 9:00 AM Type of Radiation
X-Rays
Alpha
Beta
Gamma
Neutron
- 9:30 AM Radioactive Material Sealed Sources
"Normal Form"
"Special Form"
Gamma
Radium-226
Cesium-137
Neutron
Radium/Beryllium
Americium/Beryllium
- 9:45 AM BREAK
- 10:00 AM Radiation Interactions
Radioactive Decay
Half-Life
Attenuation
Ionization
Units of Measurement
Detection
Survey Meter
Dosimeter
- 10:30 AM Radiation Exposure
Units
Dose & Dose Rates
Biological Effects & Hazards
Contamination
Exposure
Internal Hazards
Biological Half-Life
Effective Half-Life

External Hazards
Prompt Effects
 Radiation Injury
 Acute Exposure
Delayed Effects
 Cancer
 Genetic Defects
Exposure of Pregnant Women
Occupational Exposure
Risk vs. Benefit

12:00 PM Lunch

1:00 PM Reduction of Radiation Exposure
 Time
 Distance
 Divergence
 Inverse-Square Law
 Shielding
 Materials
 For Gamma Sources
 For Neutron Sources
 Half-Value Layer
 ALARA – Philosophy & Application

1:30 PM Regulatory Control
 Government Agencies
 U.S. Nuclear Regulatory Commission
 Agreement States Program
 U.S. Department of Transportation
Byproduct Material
Regulations
 "Notice, Instructions, and Reports to Workers"
 "Standards for Protection Against Radiation"
 "Rules of General Applicability to Domestic Licensing..."
 "Packaging of Radioactive Material for Transport..."
 Occupational Exposure Limits
 Personnel Monitoring
Regulatory Control (Continued)
 License Authorizations
 Materials
 Transfer
 Inventory
 Storage
 Use
 Personnel
 Service
 Commitments
Reciprocity
Radiation Area
Restricted/Unrestricted Area
Posting of Signs
Sealed Source Leak Testing
 Requirements
 Sample Collection
Security

In Storage
In Use
Transportation
Packaging
"Type A Package"
Radiation Limits
Marking
Labeling
Paperwork
Transport
Shipping
Records & Documentation
Operations
Safety
Supervision
Use of Equipment
Records
Governmental Inspections

2:45 PM BREAK

3:00 PM Occupational Responsibilities
Individual Users
Radiation Safety Officers
Corporate Officers
Legal Considerations
Liability vs. Benefit

3:15 PM Training and Instruction of Operators
Topics
Examinations
Certification
Documentation

3:30 PM Response Information
Loss
Accident
Hazards
Immediate Actions
Recovery
The Human Factor
Overexposure
Case Histories

4:00 PM Examination