

Fundamentals of Radiation Safety



COURSE DESCRIPTION

This course is designed as an introduction to basic radiation protection principles for beginning HP Technicians and for those with a minimum of technical training. Theory and practical application are equally covered with each student receiving a hard bound textbook and a complete course notebook for future reference and further depth of study. Topics include Basic Physics and Radiological Units, Atomic and Nuclear Structure, Radioactivity, Decay Schemes, Quantities and Units, Statistics Lab and Demonstration, X-rays, Time, Distance and Shielding, Interaction of Radiation with Matter, Internal Dosimetry and Maximum Permissible Concentrations, Natural Radiation, External Dosimetry, Record Keeping, Radiation Detectors (Ionization Chambers, Proportional Counters, Geiger Counters, Scintillation Detectors, Neutron Detectors, etc.), and The Biological Effects of Radiation.

PRACTICAL TRAINING THAT WILL HELP YOU:

- Understand and apply the basic principles of Radiation Safety.
- Perform essential calculations for dose control, shielding, and radioactivity concentrations in air, water, and contamination survey samples.
- Stay in compliance with all Federal and State radiation safety regulations while minimizing compliance costs.
- Minimize radiation doses to workers at your facility through the correct application of ALARA principles.
- Maintain a complete and accurate record keeping system designed to satisfy inspectors and regulatory agencies.
- Satisfy formal training requirements of NRC and State regulations.

TOPICS

PHYSICAL PRINCIPLES OF RADIATION & RADIOACTIVITY

- Atomic & Nuclear Structure
- Radioactivity & Decay

INTERACTION OF RADIATION WITH MATTER

- Beta Rays
- Alpha Rays
- Gamma Rays
- Neutrons

RADIATION DOSIMETRY

- Units
- External Dosimetry
- Internal Dosimetry
- Limits

BIOLOGICAL EFFECTS OF RADIATION

- Dose Responses: Direct & Indirect Action
- Acute Radiation Effects
- Delayed Radiation Effects
- Biological Effectiveness of Radiation

RADIATION LIMITS

- Regulatory/Advisory Bodies
- External Limits
- Internal Limits
- Special Limits

RADIATION DETECTION & MEASUREMENT

- Alpha/Beta Particle Survey Instruments
- Gamma Radiation Survey Instruments
- Neutron Survey Instruments
- Personnel Dosimetry
- Instrument Calibration

BASIC MATHEMATICS REVIEW

- Practical Problem Calculations
- Unit Conversions

RADIATION SHIELDING

- Design & Use of Radiation Shields
- Classroom Exercise: Shield Design
- Dose Minimization (ALARA Concept)

RADIOACTIVE CONTAMINATION

- Contamination Control Program Elements
- Effective Contamination Surveys
- Selection, Use & Cleaning of Protective Clothing
- Design & Use of Containments

AIR SAMPLING & RESPIRATORY PROTECTION

- Purpose of Air Sampling
- Representative Air Sampling
- Air Sampling Methods
- Types & Uses of Respirators

RADIOACTIVE WASTE

- Types & Sources
- Handling & Treatment of Wastes
- Waste Disposal

LEGAL ASPECTS OF RADIATION SAFETY

- Records
- Radiation Litigation Cases
- Probability of Causation Concept

RESPONSE TO RADIATION SAFETY INCIDENTS

- Initial Response

- Follow-up Response
- Long-Term Corrective Actions
- Documentation

OVERSIGHT OF NUCLEAR FACILITY HP PROGRAMS

- Nuclear Power Reactors
- Hospitals/Clinics
- Uranium Production/Enrichment/Research
- Accelerators
- Radiography Units

CONTINUING EDUCATION CREDITS



The American Academy of Health Physics (AAHP) has awarded this course ___ continuing education credits.
Assigned ID Number:

For further information or assistance, please contact:

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