Radiation Protection Officer Training Course

Course Outline

A. Fundamentals of ionising radiation / radiation protection

1. The atom and its relation to ionising radiation
2. Ionising radiation & ionization
3. Unit multipliers
4. Unit of radiation exposures (dose)
5. Basic principle of radioactive decay
6. Radioactive half-life
7. What we know about X-Rays
8. Basic of X-Ray production
9. Linear Accelerators (LINAC)
10. Biological effects
11. Deterministic Effects
12. Stochastic Effects
13. Source of natural and manmade radiation

B. Ionising Radiation Sources (around the world / industry / medicine)

1. Nuclear reactors & facilities (licensed sites)
2. Irradiation facilities (Industrial)
3. Irradiation facilities (Research / Medical)
4. Industrial radiography
5. Hospital sources
6. Research facilities
7. Measurement gauges
8. Security / Food Industry (& Quality control)
9. Natural Sources
10. Excepted package
11. Type A package

C. Specific Radiation Sources

1. X-Ray systems (Low energy)
2. X-Ray systems (Low energy) – Radiation Safety
3. X-Ray systems (High energy)
4. X-Ray systems (High energy)-Radiation Safety
5. Trace Equipment (NI-63)
6. Illegal trafficking of radioactive sources

C1. Industrial Gauges

1. Nuclear gauges – Basics
2. Examples of some gauges
3. Typical Sources of radiation
4. Sources integrity
5. Radiation safety – Nuclear gauges
6. Management of use of nuclear gauges

C2. Medical Sources

1. Basic of medical uses
2. Examples of medical uses of radiation
3. Typical sources of radiation in medicine
4. Source integrity
5. Radiation safety – Medical sources
6. Management of use of medical sources

C3. Research Sources

1. Basic of research uses
2. Examples of research uses of radiation
3. Typical sources of radiation in research
4. Source integrity
5. Radiation safety-Research sources
6. Risk assessment and management of use of research sources

D. Practical Radiation Protection (time, distance, shielding, protection)

1. External and internal radiation hazards
2. Protection by time
3. Protection by distance
4. Protection by shielding
5. Internal radiation protection

E. Accidents / Incidents / Security Incidents (Case Studies)

1. Strontium 90 incident – Georgia
2. Radiography incident
3. The radiological accident in San Salvador
4. Alexander Litvinenko – PO-210 poisoning
5. Baby through X-Ray Machine
6. Greensboro, North Carolina
7. Gronzny, Chechnya
8. Gamma Kolos
9. Radiation source data – Security
10. Contingency plans
11. Content of contingency plans
12. Contingency plan practice

F. Radiation detection & measurement (monitoring, dosimetry, leak test)

1. Monitoring instruments & selection
2. General monitoring techniques
3. Dosimetry & personal monitoring

G. Table Top Exercises (incident response and contingency planning)

1. Windup: Description of plant
2. Windup: The incident
3. Scanner outline

H. Radiation Protection Legislation (IAEA, UAE, UK Best Practices)

1. The ICRP system of dose limitation
2. International regulation and standards
3. UAE regulatory framework for work with ionising radiation
4. Philosophy of radiation protection
5. Operation of the regulation
6. Exemption from regulatory control
7. Generic requirements
8. Optimization & dose limits
9. Management requirements
10. Prevention of accidents / emergency plans
11. Operation experience
12. Safety of generators and radioactive sources
13. Reporting
14. Responsibility of licensee for optimization of protection
15. Controlled & supervised area
16. Local rules & personal protective equipment
17. Workplace monitoring / personal monitoring

I. Radiation Protection Management (RPO/RPS, Local Rules, Risk)

1. Local rules – Introduction
2. Local rules – Content
3. Local rules / procedures
4. The RPO – Responsibility
5. RPO – Suitability
6. RPO Duties
7. The RPA / Qualified Expert
8. Radiation manual outline

J. Course Summary / Discussion / Putting knowledge into practice

1. Course summary
2. Further Information