
Irradiator Technology for Inspectors

Course Schedule

DAY 1

Session 1	Introduction
9:00 - 10:15	. Welcome . Preliminary tour of IR-147
10:15 - 10:30	COFFEE BREAK
Session 2	Industrial Irradiators
10:30 - 11:30	. Types . Components . Design principles . Touchtime . PLC
Session 3	Research Irradiators
11:30 - 12:00	. Types . Design
12:00 - 13:00	LUNCH
Session 3	Research Irradiators (continued)
13:00 - 13:30	. Maintenance
Session 4	Cobalt-60
13:30 - 14:30	. Cobalt-59 . Production of Co-60 . Transportation of Co-60 . Handling of Co-60

Session 5

Source Loading

- 14:30 - 15:15
- . What every operator should know
 - . Handling tools
 - . Typical loading
 - . Source loading procedure

15:15 - 15:30

COFFEE BREAK

Session 6

Operation of Industrial Irradiators (Hands-on)

15:30 - 17:00

- . Operating modes
- . Sequence diagram
- . PLC

DAY 2

Session 7	Safety Systems & Features
9:00 - 10:00	. Fault indicators
10:00 - 10:15	COFFEE BREAK
10:15 - 11:00	Safety Systems & Features (continued)
	. Caution indicators
	. Safety features
	. Hands-on review of safety systems
Session 8	Walk-through Inspection (hands-on)
11:00 - 12:00	. A complete safety inspection is performed
12:00 - 13:00	LUNCH
13:00 - 14:00	Walk-through Inspection (hands-on)(continued)
	. A complete safety inspection is performed
Session 9	Irradiator Maintenance
14:00 - 15:15	. Control room organization
	. Equipment maintenance
	. Electrical/ Mechanical
	. Safety checks
15:15 - 15:30	COFFEE BREAK
Session 10	Good Manufacturing Practices
15:30 - 17:00	. Standard Operating Procedures
	. Following product from receiving to shipping

DAY 3

08:00 Leave Laval for Kanata

Session 11 **Tour of a cobalt-60 production facility**

All day . Storage pool
. Hot cells
. Encapsulation
. Leak testing
. F-168 container
. Transportation

12:00 - 13:30 LUNCH

Session 12 **Tour of a Molybdenum 90 production facility**

13:30 - 15:00 . Guided tour of the MDS Nordion Molybdenum 90 production facility

15:00 - 18:00 Return to Laval

DAY 4

- Session 13** **Emergency Procedures**
- 9:00 - 10:00 . Procedures as required by 10CFR36
- 10:00 - 10:15 COFFEE BREAK
- Session 14** **Wipe test (Hands-on)**
- 10:15 - 11:30 . A source rack wipe test is performed
- Session 15** **Radiation Safety Officer and Operator responsibilities**
- 11:30 - 12:00 . Maintenance records
 . Irradiation log book
 . Visitor records
- 12:00 - 13:00 LUNCH
- Session 16** **Radiation Survey (hands-on)**
- 13:00 - 14:30 . A radiation survey of biological shield is performed
- Session 17** **Incidents**
- 14:30 - 15:15 . Incidents at irradiation facilities
- 15:15 - 15:30 COFFEE BREAK
- Session 18** **Dosimetry (hands-on)**
- 15:30 - 17:00 . Types of dosimeters
 . Characteristics
 . Reading equipment

DAY 5

Session 19 **Regulations**

- 8:00 - 9:00 . USNRC regulations
 . IAEA guidelines
 . ANSI standards

Session 20 **Licensing**

- 9:00 - 9:45 . USNRC Guide
9:45 - 10:00 COFFEE BREAK

Session 21 **Audit**

- 10:00 - 11:15 . Audit of radiation safety procedures,
 operational procedures and safety systems

Session 22 **Review**

- 11:15 - 11:30 . Discussion

Session 23 **Examination**

- 11:30 - 13:30 . Written test

Note: All hands-on exercises are carried out using a full scale commercial irradiators and two research irradiators.

Dosimetry exercises are possible in our dosimetry laboratory which currently handles 7 (seven) of the most used dosimetry systems in the world.