
Irradiator Technology (H-315)

Course Schedule & Content

DAY 1

Session 1	Introduction
9:00 - 10:15	. Welcome . Preliminary tour of IR-147
10:15 - 10:30	<u>COFFEE BREAK</u>
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	<u>LUNCH</u>
Session 3	Research Irradiators (continued)
13:00 – 13:30	. Use . Inspections (hands-on)
Session 4	Cobalt-60
13:30 - 14:30	. Cobalt-59 . Production of Co-60 . Transportation of Co-60 . Handling of Co-60

DAY 1(continued)

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

Safety Systems & Features

- 15:30 - 17:00
- Personnel protection
 - Equipment protection
 - Product protection

DAY 2

Session 6	Safety Systems & Features
9:00 - 9:30	Less important faults & cautions
Session 7	Operation of Industrial Irradiators
9:30 -10:00	Start-up procedure, Warning signs Operating modes, PLC
10:00 - 10:30	<u>COFFEE BREAK</u>
Session 8	Walk-through Inspection (hands-on)
11:00- 12:00	A complete safety inspection is performed
12:00 - 13:00	<u>LUNCH</u>
Session 8	Walk-through Inspection (hands-on)
13:00- 14:00	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	<u>COFFEE BREAK</u>
Session 10	Process control & Validation
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 Dosimetry (hands-on)

9:00 -10:00 . Types of dosimeters
 . Characteristics
 . Reading equipment

10:00 - 10:15 COFFEE BREAK

Session 14 Emergency Procedures

10:15 – 11:15 . Procedures as required by 10CFR36

Session 15 Wipe test (video)

11:15 – 11:30. How a source rack wipe test is performed

Session 16 Radiation Safety Officer and Operator responsibilities

11:30 – 12:00 . Maintenance records
 . Irradiation log book
 . Visitor records

12:00 - 13:15 LUNCH

Session 17 Radiation Survey (hands-on)

13:15 - 13:45 . A radiation survey of biological shield is performed

Session 18 Incidents

13:45 - 14:30 . Incidents at irradiation facilities

14:30 - 15:00 COFFEE BREAK

DAY 4 (continued)

Session 19 **Introduction Regulatory Licensing & Inspections (NRC instructor)**

15:00 – 17:00

- . Introduction

- . Inspection Checklists
 - . Self-shielded irradiator safety
 - . Increased controls inspections
 - . Panoramic irradiator safety

DAY 5

Session 22

Review

9:00 – 10:00

. Questions & Discussion

Session 23

Examination

10:30 - 12:15

. Written test

References: Inspection Checklists for:

NSTS

Panoramic Irradiator

Self-Shielded Irradiator

IC

Instructors Cv's

Note:

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