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 irradiator 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.