NDT
The Regulatory Inspector's Perspective

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Aims of Presentation

- Background
- Why Inspect
- The inspection process
- Main Issues of Concern
- Conclusions

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NDT sector in Ireland

- 18 Companies in total
- 8 Companies engaged in site radiography
- 19 Ir-192 sources
- 15 Se-75 sources
- 0 Co 60 sources
- 47 X-ray units

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Radionuclide Properties

Radionuclide	Halflife days	Energy MeV	Dose rate per TBq at 1m (mSv/hr)	Dose rate per TBq at 10 cm (mSv/hr)	Steel Thickness mm
Ir192	74	0.2-0.6	113	11339	10-70
Se75	120	0.12-0.97	46	4590	4-28
Co60	1934	1.17 & 1.33	306	30731	50-120

Purpose of Inspections

- Assess compliance with legislation and licence conditions
- Assess how radiation protection is implemented in practice
- Assess the organisational culture and commitment to radiation protection
- Provide an opportunity for licensees to raise issues with the regulatory authority

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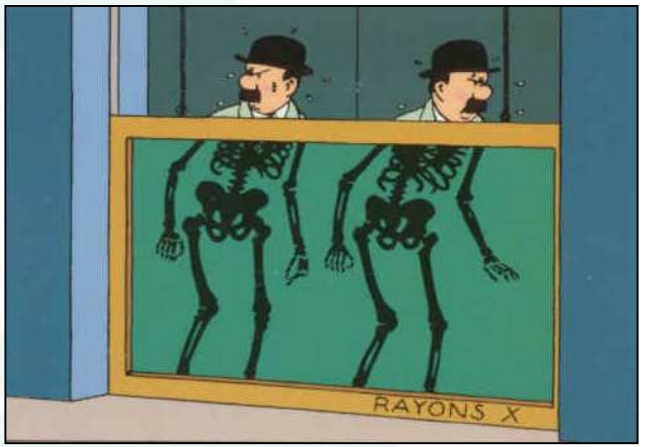
What are we trying to achieve

- Raise standards/encourage improvements
- Bring examples of good practice observed
- Build face to face relations
- Remind licensees, especially senior management, of their responsibilities
- Remind licensees of EPA's statutory role and powers (licensing, inspection, guidance and enforcement)

What are we trying to stop

When do we inspect?

- EPA Board approved annual inspection program.
  - At least one site NDT visit per year
- Complaint received in relation to a licensee
- A “serious” incident has occurred
- Concerns have arisen with regard to documents supporting licence application/amendment



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Types of Inspections

- Radiography in Bays
  - Usually announced
- Site Radiography
  - Usually unannounced of short notice inspections
  - 4 day advanced notification required
- Administrative Inspections
  - Emphasis on reviewing admin aspects of licence, records and source store

Advanced Notification of Site Radiography

- 4 days advanced notification required
- Information required
  - Client details
  - Location of work
  - Date at time of work
  - X-ray or source
  - Must be informed of cancellation of work.
- Allows for preparation of site specific Risk Assessment and Safe working procedures
- Allows ORP to carry out “true” unannounced inspections even at weekends.

Site Specific Risk Assessment

- Should cover normal operations and reasonably foreseeable accidents
- Most appropriate NDT Technique
- Delineation of the controlled area
  - 2.5 uSv at barrier
- Contingency plans
- Permit to work
- Site inductions
- Special requirements such as working at height/ confined spaces etc
- Access control

Site Radiography

- No engineering controls
- Rely on safe systems of work:
  - temporary barriers (patrolled)
  - manually operated signals
  - temporary warning notices
  - use of a radiation monitor
  - supervision of the area

Inspection Process

- Arrive in advance of the start of the inspection
  - Observe transport vehicle to ensure compliance with ADR
  - Vehicle placarding and labelling
  - Vehicle alarmed
  - Documentation
  - ADR Equipment
  - Position of source in vehicle
  - Is source adequately secured

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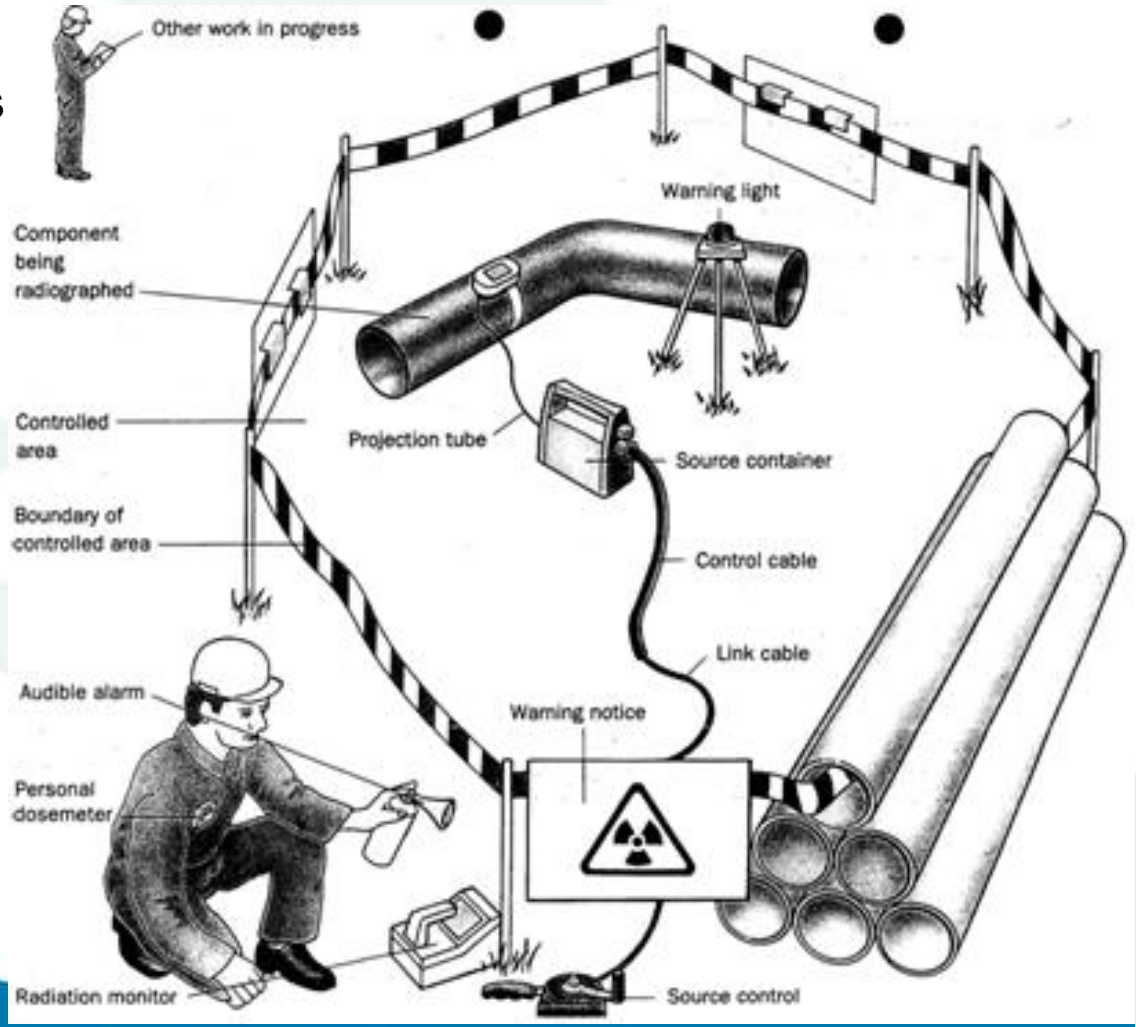
Inspection Process

- Observe radiographers setting up controlled area
  - Temporary barriers
  - Warning signs and notices
  - Gamma Alarms
  - Warning Lights
  - Dose rate at barriers (2.5 uSv/hr)



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Inspection Process

- Do all radiographers have direct reading alarming EPD'S that are calibrated
- Are all radiographers adequately qualified and trained
- Do all radiographers have TLD's
- Is at least one calibrated survey meter available?
- Is general setup satisfactory?
- Is source on Licence schedule

Inspection Process

- Inspection in Progress
  - Pre-warning of exposure
  - Warning that exposure is in progress
  - Position of radiographer
  - Patrolling of controlled area boundary (continuous)
  - Each radiographer must have a direct reading alarming EPD and TLD
  - Radiography workload should be shared between radiographers
  - A survey meter must be used after each exposure to ensure that the source has been retracted

Inspection Process

- Are survey meters and EPDs calibrated?
- Review of documentation
- Ask the radiographer some basic questions re: radiation and radiation safety

Issues (Site Radiography)

- Survey meter not used (VERY COMMON)
- Non compliances with various requirements of the ADR
  - Vehicle signage and placarding and packaging labelling
  - Consignors note and instructions in writing
- TLDs or EPDs not been worn
- Inadequate or unclear warning signs at barrier
- Controlled area not properly patrolled and supervised
- Radiation monitoring equipment not calibrated
- Radiographers ALARA
- General Radiation Awareness Training
- Availability of emergency equipment
- Dose rate at barrier above 2.5 uSv/hr

Other Issues

- Administrative inspections
  - Source inventory not reflected on licence
  - Checks on NDT equipment prior to use
  - All requested records not available
  - Deficiencies with Risk Assessments and Radiation Safety Procedures
  - Inconsistent use of the 4 day notification form
  - Inadequate exercising of contingency plans
  - Servicing of X-ray units
- Inspections in Bays
  - Inadequate warning signs or broken warning lights

Issues for NDT companies inc Radiographers

- Pressures from the Client
  - Inadequate time to prepare proper site specific risk assessments and work procedures.
  - Client has poor understanding of associated risks
  - Time pressures to get the job done quickly
- Difficult working conditions
  - Height
  - Confined space
  - Untidy workplace

Conclusions/Observations

- Radiation Safety in Industrial Radiography in Ireland is good, however constant vigilance is required as risks remain high
- Regular inspections by the Regulatory Authority are required (especially site radiography).
- Advance notification of site radiography essential for “true” site radiography inspections
- Regular safety audits by the RPA are desirable
- Need to educate client about risks associated with NDT work
- Compliance or Safety Culture?

Thank you for your attention

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