TOOLBOX TALK AWARENESS PACKAGES

HAZ-RAD · Ionising Radiation and NORM Awareness

# Product Overview

Audience: Workers and supervisors who work near radiation gauges, x-ray equipment or industrial radiography, or handle scale, sludge, mineral sands or ores that can hold NORM · Duration: 20–30 minutes

Version 1.0 · 22 November 2026

**For workers near radiation gauges, x-ray equipment and industrial radiography, or handling scale, sludge and mineral sands: where ionising radiation and NORM are found, time, distance and shielding, signs and barriers, dosimeters, and what to do about a damaged gauge.**

Ionising radiation cannot be seen, felt or smelt. At work it comes from sealed sources in fixed and portable gauges, from x-ray equipment and industrial radiography, and from naturally occurring radioactive material (NORM), which can build up in pipe scale, sludge and sediments, and is found in mineral sands and some ores. Most workers near these sources are kept safe by the controls around them: the shielding, the signs and barriers, and the licensed people who use them.

This talk covers where radiation and NORM are found at work, how time, distance and shielding protect you, warning signs and exclusion zones, personal dosimeters, hygiene around NORM, and what to do if a gauge is damaged or a source is lost. Using, moving, maintaining or disposing of radiation sources is licensed or authorised work, and this talk is not training for it.

## Learning outcomes

By the end of the session participants will be able to:

- Name where ionising radiation and NORM are found at work: gauges, x-ray equipment, industrial radiography, scale, sludge and mineral sands
- Explain why radiation cannot be seen or felt, and why the controls around a source matter
- Use time, distance and shielding to keep your exposure as low as you reasonably can
- Recognise the radiation warning sign and respect barriers and exclusion zones
- Wear and look after a personal dosimeter when you are given one
- Know that only licensed or authorised people use, move or repair sources, and what to do about a damaged gauge or a lost source


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## What it covers

| Module | Covers |
|---|---|
| **Where it is** | What ionising radiation is; Gauges, x-ray and radiography; NORM in scale, sludge and sands |
| **Controls that work** | Time, distance and shielding; Signs, barriers and exclusion zones; Dosimeters and hygiene |
| **Your part** | Never touch a source; Damaged gauges and lost sources; Report it |

## Activities

- Spot the source: workers look at four jobs, from a level gauge on a hopper to cleaning scale out of a pipe, and decide where the radiation is and how to keep it low
- What would you do: workers decide what to do in four situations, from a radiography barrier across their route to a gauge hit by a loader

## What is in the package

| Item | File |
|---|---|
| Editable PowerPoint presentation with speaker notes, plus PDF | 02_TRAINING_PRESENTATION/Training Presentation.pptx and .pdf |
| Facilitator guide with a running sheet, discussion prompts and model answers | 03_FACILITATOR_GUIDE/Facilitator Guide.docx and .pdf |
| Participant handout with the key points to take away | 04_PARTICIPANT_HANDOUT/Participant Handout.docx and .pdf |
| Attendance record form, to capture who attended, when, and who facilitated | 06_RECORDS/Attendance Record.docx and .pdf |
| Excel attendance register | 06_RECORDS/Attendance Register.xlsx |
| Multiple-choice theory assessment, to record understanding if your business wants to | 05_ASSESSMENT/Theory Assessment.docx and .pdf |
| Answer key for the assessment | 05_ASSESSMENT/Assessment Answer Key.docx and .pdf |
| Certificate template | 06_RECORDS/Certificate Template.docx |
| Start here: Read Me First, Product Overview, Permitted Use Terms, Version Information | 01_START_HERE/ (four PDFs) |

## What you need to deliver it

- A facilitator such as a supervisor, leading hand or WHS adviser who has read the facilitator guide and knows your site's arrangements for the topic
- A screen or projector, or printed slides or handouts: it works in a crib room, site office or on a video call
- Your own site procedures for the topic, to point to during the session


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## Questions

**Does it tell us the dose limits or how far to stay away?** No, on purpose. The talk quotes no doses, dose limits, distances or times: those depend on the source and are set by your radiation regulator, your licence conditions and your radiation management plan. The talk tells workers to follow the signs, barriers and instructions of the licensed person or radiation safety officer, and the guide tells the facilitator what to check.

**Can we add our own site procedures and photos?** Yes. The slides, handout and guide are editable, and the facilitator guide marks the places to add your own procedures, contacts and photos of your workplace.

**Do we have to use the assessment?** No. It is there if your business wants a record that each worker understood the key points. The attendance record on its own shows who attended and when.

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TOOLBOX TALK

# Ionising Radiation and NORM Awareness

The hazard you cannot see, feel or smell: working safely near radiation sources and NORM

20–30 minutes · Workers and supervisors who work near radiation gauges, x-ray equipment or industrial radiography, or handle scale, sludge, mineral sands or ores that can hold NORM

**[Company name] · [Date] · [Facilitator name]**

RAD


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# What this talk is, and is not

## This talk covers

- ✓ Where radiation and NORM are found
- ✓ Time, distance and shielding
- ✓ Signs, barriers and dosimeters
- ✓ What to do when something goes wrong

## This talk is not

- ✕ Licensed or authorised radiation work
- ✕ Radiation safety officer training
- ✕ Lasers, UV or radiofrequency
- ✕ Our plan: **[Our radiation management plan]**

**Awareness only. Using, moving, repairing or disposing of a source is licensed or authorised work.**


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# Where ionising radiation is found at work

Radiation at work comes from sources, and from some materials.

- Fixed gauges: level, density and thickness gauges
- Portable gauges: soil and road density gauges
- X-ray equipment: scanners, inspection and analysers
- Industrial radiography: checking welds and castings
- NORM: scale, sludge, mineral sands and some ores

### A composite example

- A fitter is asked to unbolt a hopper chute. A level gauge is mounted beside it.
- He starts work without checking. Nobody had closed the shutter or told the radiation safety officer.

**Know where the sources are before you start.**


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# Duties under health and safety laws

## The business must

- Know and control every source
- Hold the licences and plans the law requires
- Keep exposure as low as reasonably achievable
- Train, monitor and supervise workers

## You must

- Follow signs, barriers and instructions
- Wear your dosimeter if given one
- Never touch, move or open a source
- Report damage, loss or concerns

Most health and safety laws give these duties. Check the law where you work (in Australia, WHS or OHS laws).


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# The order of controls for radiation

1 **Elimination** Use a method that needs no source, where one exists

2 **Substitution** A weaker source, or x-ray that switches off

3 **Isolation** Shielding, closed shutters, locked stores, barriers

4 **Engineering** Interlocks, warning lights, shielded rooms

5 **Administrative** Licences, permits, signs, training, monitoring

6 **PPE** Gloves, overalls and RPE around NORM, as assessed

**HIGHER ORDER**

Higher order controls remove or control the hazard at the source, or put a barrier between people and the hazard.

**LOWER ORDER**

Lower order controls rely on people to do a thing or wear a thing, every time, tired, distracted or rushed.

*Behaviours are not on the hierarchy, but behaviours and culture decide whether every control on it actually works.*

**Shielding and distance protect you. Luck does not.**


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# Ionising Radiation and NORM Awareness

Participant handout · keep this

You cannot see, feel or smell radiation. Respect the controls that keep you safe near sources and NORM. Keep this page.

## The order of controls

1. Use a method with no source, where one exists
2. A weaker source, or x-ray that switches off
3. Shielding, shutters, locked stores, barriers
4. Interlocks, warning lights, shielded rooms
5. Licences, permits, signs, training, monitoring
6. Gloves, overalls and RPE around NORM

## Time, distance, shielding

- Less time near a source
- More distance from it
- Shielding and shutters in place

## Never

- Touch, move or open a source
- Cross a barrier or exclusion zone

## Every shift

- ☐ Is there a radiation source or NORM where I am working today?
- ☐ Are the signs, barriers and exclusion zones in place?
- ☐ Is the gauge shutter closed or the source locked away while I work near it?
- ☐ Am I wearing my dosimeter, if I have been given one?
- ☐ Do I know who the radiation safety officer is?

## If something goes wrong

- Do not touch it; keep people back
- Report it now; note who was near

## Who and where

- **[Radiation safety officer]**
- **[Who to report to here]**

**Keep your distance, respect the signs and barriers, and never touch a source.**

*This is awareness training. It is not a licence, a ticket, a permit or a competency. It is not training for licensed or authorised radiation work.*



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