



Radiation

Doc No: CMR WHS STD 010

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1. Introduction

1.1 Purpose

The purpose of this standard is to provide guidance on how to:

- Manage the risks associated with exposure to radiation. This is supported by the Radiation Bow Tie Risk Assessment.
- Implement the Radiation Core Mandatory Requirement (CMR). This is supported by CMR FRM 010a Radiation Critical Control.

1.2 Scope

In Scope - All MPC Kinetic controlled work sites undertaking works associated borehole logging, including:

- Use of equipment
- Storage or transportation of equipment
- Acquire and disposal of equipment.

Out of Scope – Works outside of MPC Kinetic control. The manufacture of borehole logging equipment.

1.3 Authorised User

All Field Employees and Contractors who are licenced radiation user in borehole logging.

2. Critical Control Implementation

2.1 Meet Licensing Requirements

2.1.1 Statutory Licensing Requirements

Statutory licensing requirements for the use and transportation of radioactive sources must be obtained.

Licensing requirements must be confirmed for each State or Territory that the radioactive sources may be used or transport to.

Licensing conditions include:

- Registration of the equipment containing the radioactive materials
- Complying with the specific conditions of the license.
- Possession licences obtained for each state/territory the material is located
- Transporting of the radioactive source
- Source register established
- Monitoring of radiation exposure levels

Personal exposed to radioactive material [other than RSO's] and authorised RSO's will undertake internal MPK radiation safety training based on radiation safety management plan requirements.

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- 2.1.2 Develop and verify management plans**
- Management plans must be developed and verified to demonstrate a safe system of work based of state or territory requirements.
- Any licence conditions and any special instructions from the statutory authority must be clearly identified in the plan.
- The plan must contain:
- Methods for conducting and recording:
- Logging measurements
 - Radiation surveys
 - Wipe tests
 - Personal exposure monitoring.
- Steps to be taken:
- Prevent or minimise exposure
 - In the event of an emergency.
- Outline the arrangements for:
- Safe storage and transport of the equipment
 - Safe working practices
 - Calibration, repair and maintenance of the equipment
 - Remediation procedures, including incident notifications.
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- 2.1.3 Authorised Radiation Safety Officers**
- The business must have an authorised licensed Radiation Safety Officers (RSO).
- RSO's are responsible for the business meeting its licensing requirements.
- These roles are responsible for all matters relating to the radiation safety licence including, but not limited to:
- Use
 - Storage
 - Transportation
 - Disposal.
 - Reporting to statutory authority
 - Compliance
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2.2 Minimum Equipment Requirements

- 2.2.1 Purchasing equipment**
- When purchasing borehole logging equipment, the supplier must:
- Hold a license to supply the equipment
 - Demonstrate the equipment meets the relevant standards
 - Provide compliance certificates (from the relevant statutory authority).
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2.2.2 Equipment inspection requirements

These inspection activities must be recorded in the equipment logbook.
Inspections must be in line with the relevant Radiation Safety Protection Plan.

2.3 When Using Equipment

2.3.1 Using the borehole logging equipment

Only an authorised radiation user in borehole logging must use the borehole logging equipment.

Before the work starts:

- Hold an authorized radiation user licence Or be supervised by a person with an authorized radiation user licence
- Check the borehole is covered or plugged to prevent the equipment accidentally falling down the borehole
- Place the equipment in a location where it won't be hit by other machinery or vehicles in the area
- Inspect the condition of the cable / cable heads
- Run a dummy probe to check the condition of the borehole.

Before removing the equipment from its shielded container, you must:

- Confirm people not involved in the work are away from the area
- Establish an exclusion area by placing radiation warning signs and barriers
- Inform others that the work is taking place
- Ensure personal monitoring device is worn correctly and routinely monitored within ARPANSA Standards.

The equipment must only be taken out of the shielded container if:

- Conducting a wipe test
- Calibrating the device
- Undertaking the surveying work.

When transferring the equipment from the shielded container, the user must:

- Minimise the time taken
 - Use the designed handling tool.
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2.3.2 Monitoring Personal Exposure

All users must wear a personal exposure monitoring device.

All devices must:

- Be approved and sourced from ARPANSA
- Only be worn for a 2-month cycle
- Not be tampered with or misused
- Be stored away from radiation sources.

All monitoring records must:

- Be checked by authorised RSO to confirm doses are within the standard
- Be retained for the wearer's working life + 30 years.
- Individual dose monitoring results to be provided confidentially to the radiation user.

2.4 Store or Transport Equipment

2.4.1 Safe Transportation of Equipment

The safe transportation of equipment is achieved by:

- Confirming the state or territory transport requirements before transportation. This may require different licenses, or placarding on the transport vehicle
- Equipment must be placed inside a lockable shielded container.

The shielded container must:

- Be properly secured to prevent movement
- Be placed at the maximum distance from the driver
- Be fitted with the relevant radiation warning signs.

The transporting vehicle must:

- Be fitted with the relevant radiation warning signs and transport placarding
- Be fitted with a fire-resistant metal plaque engraved with the appropriate emergency telephone numbers must be carried in the passenger compartment of the vehicle.

Equipment shall be transported only in accordance with the requirements of the relevant statutory authority and the Australian Code of Practice for the safe transport of radioactive substances.

In the event of an accident or other emergency, the Authorised Radiation Safety Officer in charge of the vehicle, must notify the nearest police station and the relevant statutory authority.

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2.4.2 Minimum Storage Requirements

Storage requirements must be established for:

Vehicle storage requirements:

- When equipment is not in use, it must be stored in a lockable shielded compartment
- The key must be removed from the lock and stored in a secure location
- The vehicle must be fitted with the relevant radiation warning signs, where required by legislation
- If the equipment on a vehicle is not in use for an extended time, the equipment must be stored in an approved storage facility.

Approved storage facilities must:

- Be locked and under the control of an Authorised Radiation Safety Officer
- Be fitted with relevant radiation warning signs
- Be in a noticeable location
- Have the contact details of the Authorised Radiation Safety Officer in charge of the facility in a visible location.

Authorised Radiation Safety Officers must maintain an inventory of the equipment, it's location and the quantity.

2.4.3 Minimum Requirements for Shielding Containers

Shielding containers must be:

- Constructed of fire-resistant material
- Fitted with the relevant radiation warning signs
- Constructed as per the Code of Practice Safe Transport of Radioactive Material.

The dose rates must be checked on a regular basis, using a calibrated Geiger Counter.

Dose rates must not exceed:

- 2000 $\mu\text{Sv/h}$ at any point 5 cm from the container surface
- 100 $\mu\text{Sv/h}$ at any point 100 cm from the container surface
- Or any other levels as determined by the appropriate statutory authority.

2.5 Disposal of Equipment

2.5.1 Disposal of equipment

Disposal of equipment must include:

- Obtaining approval from the relevant authority before disposal
- Taking the waste to a licensed waste facility
- Obtaining documentation from the waste facility to track the waste.