

# Safety alert



Explosives

Explosives Inspectorate

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## Current leakage causes explosives to misfire in underground coal shot

### Purpose

1. This alert is to advise persons involved with the use of electric detonators in damp conditions such as in an underground coal environment where current leakage can cause a detonator to misfire.

### Scope

2. This safety alert provides important safety information to shotfirers especially those in underground coal mines conducting blasting with standard electric detonators.

### Background

3. An explosive incident occurred in an underground coal mine where electric detonators were used in a floor shot for a sump. The working environment during charging was “damp.” A generator type firing device was used to fire the shot. The shotfirer observed less heave in one area of the blast and discovered five sets of detonator wires still in the stemming. The shotfirer then retested all the exposed wires and found one live shot. The shotfirer refired that shot and it detonated. During the recovery operation, ten misfired detonators were discovered.

4. The investigation found the probable cause to be “Damage to detonator leg-wires or unprotected leg-wire connections resulted in the current leakage dissipating through water and strata, and therefore less than adequate excitation current through some of the detonators. The current leakage potential went undetected in circuit resistance tests.”

5. Possible causes include:
- damage to lead wires during charging,
  - rib fall or ground movement after the first adjacent shot was initiated, and
  - a connection may have been knocked sideways into pooling water.



## Issues

6. The consequence from misfires is the potential for the subsequent unplanned detonation of the detonators and the permitted explosive by impact, friction or shock. Circumstances will arise where the explosives may be detonated during excavation activities with machinery.
7. The issues listed below are relevant in the use of electric detonators and should be considered with existing control measures:
  - a. shotfirers should be aware of the information provided in technical data sheets for the use of electric detonators, for example, statements including “After joining the detonator leg wires together, the bare connections should be insulated to minimise the possibility of current leakage from the circuit”;
  - b. the use of grease filled wire connectors for making connections in wet conditions should be considered;
  - c. different types of electric detonators must not be in the same circuit;
  - d. current leakage in damp conditions or in very conductive ground must be managed;
  - e. the exploder is suitable for the purpose and is properly maintained; and
  - f. An ohmmeter does not pick up current leakage.

## Recommendations

8. All licence holders should immediately review their safety management system, procedures and work instructions to ensure that appropriate systems and control measures are in place for the use of electric detonators in a damp environment where current leakage may occur.
9. All licence holders should check that the control measures are in place, the procedures and work instructions under their safety management systems are being followed and that records are being kept.
10. Ensure that all persons in your organisation receive a copy of this Safety alert.

## Further Information

11. Further information is available by contacting the Explosives Inspectorate’s Regional Offices at contact numbers found at the website below. More safety alerts, information bulletins and reports are available on the Inspectorate’s website:

[http://www.dme.qld.gov.au/mines/safety\\_compliance.cfm](http://www.dme.qld.gov.au/mines/safety_compliance.cfm)

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## Chief Inspector of Explosives

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### Southern Region

3238 3728

sroexplosives@dme.qld.gov.au

### Central Region

4938 4442

croexplosives@dme.qld.gov.au

### Northern Region

4799 7004

nroexplosives@dme.qld.gov.au

Internet : [www.dme.qld.gov.au](http://www.dme.qld.gov.au)