

SAFETY ALERT



FAILURE OF EARTH LEAKAGE PROTECTION RESULTS IN FIRE

INCIDENT

An earth-screened, 240-volt lighting cable caught fire at an underground coal mine after the insulation was rubbed completely through by the edge of a conveyor belt. The single protective device, a combination "Residual Current Device and Miniature Circuit Breaker" (RCD/MCB) did not automatically disconnect the unsafe electrical circuit. The live cable had the potential to give a fatal electric shock.

CIRCUMSTANCES

The cable was installed as part of a new conveyor installation. A poor standard of work resulted in the cable coming away from its straining wire. The live cores of the cable were found arcing to each other and to the exposed earth screen. All their insulation had been stripped off from rubbing against the conveyor belt.

INVESTIGATION

Installation, commissioning and maintenance practices did not prevent or detect cables in a potentially dangerous location.

The single protective device for the circuit (a Heinemann, SF15A, 2-Pole, Combination RCD/MCB rated at 20 amperes, with an earth leakage trip current of 30 milliamperes) did not automatically disconnect the unsafe electrical circuit.

The device did not trip when the test button was pressed. It also did not trip when tested by connecting the active terminal to earth through a current-limiting resistor.

Several other SF15A RCD/MCB circuit breakers at the mine also failed the earth leakage tests. Other mines have had similar problems (with both single and three phase versions).

The manufacturer states in a report that devices of this vintage are prone to failure and were superseded in 1991.

Many of these devices remain in service in the NSW mining industry.

RECOMMENDATIONS

- Mines review the risks and how they treat risks associated with the use of these particular devices, cable installations and electrical protection. The risks should be treated in the order set out in AS4801-2000, "Occupational health and safety management systems – Specifications for guidance and use".
- Mines review their installation, commission and maintenance practices for electrical equipment and systems to ensure that risk treatments for preventing electric shock, fire and explosions are in place and functioning.

R Regan
ASSISTANT DIRECTOR SAFETY OPERATIONS