

# Safety Alert

Mines

Mines Inspectorate

Safety Alert No. 264  
18 April 2011

## Hazard of backfeed on some UPS units

**Mine type:** All mine types

**Incident:** A recent electric shock at a mine has highlighted the hazard of backfeed on some UPS (uninterruptible power supply) units. These apparatus provide emergency power to a load when the input mains power is interrupted or disconnected. However, in this case, 240Vac was measured on the plug pins of the disconnected UPS mains supply cable while the UPS was powering a load. Subsequent testing of other units on site revealed 75 per cent of all models and brands tested had backfeed voltages of 55Vac or more.

**Equipment:** Various UPS systems

**Hazard:** When the mains supply is isolated, any UPS backfeed voltage could possibly energise otherwise isolated circuits. As this backfeed voltage is unlikely to be covered by any protection circuitry, it could prove lethal to anyone coming into contact with this circuit.

**Cause:** Lack of backfeed protection as required under AS 62040.1.1-2003 Uninterruptible power systems (UPS) — General and safety requirements for UPS used in operator access areas, section 5.1.4 Backfeed protection.

**Comments:** Testing several units revealed varying backfeed voltages from identical units, as well as backfeed on a unit from another manufacturer. These units were not fitted with protective devices to limit or shutdown supply if a person received a backfeed shock. (Another unit showed no backfeed, so did not present a hazard to anyone performing electrical work or simply unplugging smaller 'plug in' units.)

### Recommendations:

1. That site procedures be reviewed to ensure UPS units and the systems they supply comply with the safety requirements of:
  - AS 62040.1.1-2003 Uninterruptible power systems (UPS) — General and safety requirements for UPS used in operator access areas, and
  - AS 62040.1.2-2003 Uninterruptible power systems (UPS) — General and safety requirements for UPS used in restricted access locations.
2. That routine maintenance procedures involve checking the provision and operation of backfeed protection circuitry.
3. That a 'test for dead' be conducted before handling areas that may be affected by UPS backfeed.
4. That persons be immediately informed of, and all units on the mine site tested to control and manage, this hazard. Note that AS 62040.1.1-2003 (Annex L (normative) Backfeed protection test, section L.1) states that excessive currents aren't allowed between any pairs of a UPS input terminals during stored energy operation, although this measurement need not be taken if measured open-circuit voltage does not exceed 30 V r.m.s. (42,4 V peak, 60 V d.c.).



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Please ensure all relevant people in your organisation receive a copy of this Safety Alert. Any such advice supplied to site should reach those who require it, and it should also be placed on the mine noticeboards. See more Safety Alerts and Safety Bulletins at [www.dme.qld.gov.au/mines/safety\\_information\\_\\_bulletins.cfm](http://www.dme.qld.gov.au/mines/safety_information__bulletins.cfm)