

2 February 2007 at page 665 is revoked, as is any Notice revived as a result of their revocation.

## 5 Design requirement

- (1) All *explosive-powered tools* used in underground coal mines must be designed, in accordance with the following standards, as amended from time to time:
  - (a) AS/NZS 1873.1:2003 *Powder-actuated (PA) hand-held fastening tools – Selection, operation and maintenance*
  - (b) AS/NZS 1873.2:2003 *Powder-actuated (PA) hand-held fastening tools – Design and construction*
  - (c) AS/NZS 1873.3:2003 *Powder-actuated (PA) hand-held fastening tools – Charges*
  - (d) AS/NZS 1873.4:2003 *Powder-actuated (PA) hand-held fastening tools – Fasteners*
- (2) Without limiting 5 (1) above, all explosive-powered tools including its associated range of explosive charges and fasteners, must be designed such that the tool itself is not an effective ignition source of a methane enriched atmosphere.

## 6 Testing requirements

### 6.1 General

The explosive-powered tool, including its associated range of explosive charges and fasteners as intended for use in the underground coal mine, must be tested to determine if the explosive-powered tool is likely to ignite an explosive atmosphere.

### 6.2 Test method

- (1) All explosive-powered tools must be tested as follows:
  - (a) the explosive-powered tool is to be placed in a small flameproof test chamber which is filled with a mixture of 7.5% volume ethylene in air;
  - (b) the tool is to be loaded with the range of relevant strip-mounted cartridges and range of relevant sized fasteners for which registration is sought;
  - (c) testing is to be performed at maximum and minimum power selections, using short and long fasteners firing into a range of target materials;
  - (d) testing is to be performed with a range of expected target materials including industry brick, concrete and steel plate;
  - (e) where applicable, the tool is to be tested with supplied extension trigger assembly fitted and with magazine.
- (2) Testing must be repeated at least 5 (five) times for each combination to be able to demonstrate the repeatability of the results.
- (3) Testing must be repeated to simulate all reasonably foreseeable operating conditions of the explosive-powered tool.

### 6.3 Test facility

All testing must be carried out by:

- (a) TestSafe Australia; or

- (b) a laboratory or testing facility acceptable to the Chief Inspector having regard to test equipment, equipment calibration, quality processes, work methods, past test experience and independent technical verification.

## 7 Performance standards

When the explosive-powered tool is fired in the test chamber, the surrounding ethylene environment must not ignite.

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## WORK HEALTH AND SAFETY (MINES) REGULATION 2014

Registration of Design of Plant Used to Determine or Monitor the Presence of Gas Order 2015

I, Douglas Revette, Executive Director Governance, with the delegated authority of the Secretary, Department of Trade and Investment, Regional Infrastructure and Services in pursuance of clause 177 (5) of the *Work Health and Safety (Mines) Regulation 2014* (“the Regulation”) make the following Order.

Dated this 25th day of June 2015.

DOUGLAS REVETTE  
Executive Director Governance  
Department of Trade and Investment, Regional  
Infrastructure and Services

### Explanatory note

From 1 July 2015, any reference to the Department of Trade and Investment, Regional Infrastructure and Service is a reference to the Department of Industry, Skills and Regional Development in accordance with the *Administrative Arrangements (Administrative Changes—Public Service Agencies) Order (No 2) 2015*.

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## REGISTRATION OF DESIGN OF PLANT USED TO DETERMINE OR MONITOR THE PRESENCE OF GAS ORDER 2015

under the

WORK HEALTH AND SAFETY (MINES)  
REGULATION 2014

### 1 Name of Order

This Order is the *Registration of Design of Plant Used to Determine or Monitor the Presence of Gas Order 2015*.

### 2 Commencement

This Order commences on 1 July 2015.

### 3 Interpretation

In this Order:

*AS/NZS* is a reference to Australian/New Zealand Standards.

*Chief Inspector* is a person appointed under the *Work Health and Safety (Mines) Act 2013*.

*plant used to determine or monitor the presence of gas* means electrically powered hand-held plant, fixed installations and installations on mobile plant (but not

tube bundle systems where the analyser is installed at the surface) used to determine or monitor the presence of gas.

**Regulation** means the *Work Health and Safety (Mines) Regulation 2014*.

#### 4 Revocation of Requirements for Design Registration for Gas Detection and Monitoring Plant and Items

Pursuant to clause 177 (5) and clause 34 (5) of Schedule 12 of the Regulation, the *Requirements for Design Registration for Gas Detection and Monitoring Plant and Items* published in *NSW Government Gazette* No 90 of 16 September 2011 at page 5524 is revoked, as is any Notice revived as a result of their revocation.

### 5 Design requirements

#### 5.1 Gas detection design

(1) All plant used to determine or monitor the presence of gas used in underground coal mines must be designed to detect gas in accordance with this Order and the relevant parts of the following standards, as amended from time to time, but only in so far as this Order specifies:

- (a) AS/NZS 60079.29.1:2008 *Explosive atmosphere – Gas detectors – Performance requirements of detectors for flammable gases*;
- (b) AS/NZS 4641:2007 *Electrical apparatus for detection of oxygen and other gases and vapours at toxic levels – General requirements and test methods*.

(2) In this Order, any reference to the standards at 5.1 (1) above is a reference to such standards, as amended from time to time.

#### 5.2 Electrical explosion protection design

All plant used to determine or monitor the presence of gas must be designed, tested and certified to comply with the relevant parts of clause 78 ‘*Use of plant in hazardous zone (explosion-protection required)*’ of the Regulation.

### 6 Testing requirements

#### 6.1 Test facility – Gas detection

- (1) The test facility used for testing the performance of gas monitors must be a test facility which is unrelated to the organisation designing, manufacturing or supplying the gas monitors.
- (2) The test facility must either be:
  - (a) the Department of Trade and Investment, Regional Infrastructure and Services, Mine Safety Technology Centre, Thornton NSW; or
  - (b) a facility acceptable to the Chief Inspector having regard to test equipment, equipment calibration, quality processes, work methods, past test experience and independent technical verification.

#### 6.2 Plant that is designed to detect methane

(1) Plant which is designed to detect methane must be tested as per the relevant clauses of AS/NZS 60079.29.1:2008, as amended below:

- (a) clause 5.4.4.2 ‘*Long-term stability (fixed and transportable apparatus – Group I only)*’, the test period of four weeks is reduced to three weeks.
  - (b) clause 5.4.4.3 ‘*Long-term stability (portable apparatus – Group I only)*’, the test period of 20 working days is reduced to 15 working days.
  - (c) clause 5.4.24.2 ‘*Other gases*’, parts a) 3) and b) 3) are not mandatory.
- (3) Plant which is designed to detect methane up to and including 5%, must also be tested as follows:
- (a) the apparatus using catalytic combustion sensors must be exposed to a volume fraction of  $2.0 \pm 0.2$  % methane in air mixture containing a volume fraction of 50ppm hydrogen sulphide for 20 minutes and a reading taken.
  - (b) the apparatus must be exposed to a volume fraction of  $2.0 \pm 0.2$  % methane in air mixture containing a volume fraction of 200ppm ethane ( $C_2H_6$ ) and a reading taken.
- (2) Plant which is designed to detect methane up to and including 100%, must also be tested as follows:
- (a) the apparatus must be exposed to a volume fraction of  $50.0 \pm 5.0$  % methane in air mixture containing a volume fraction of 0.5% ethane ( $C_2H_6$ ).

#### 6.3 Plant that is designed to detect Oxygen

Plant which is designed to detect Oxygen must be tested as per the relevant clauses in AS/NZS 4641:2007, as amended below:

- (a) clause 4.3.2 ‘*Transportable apparatus*’, the test period of four consecutive weeks is reduced to three consecutive weeks.
- (b) clause 4.3.3 ‘*Fixed apparatus*’, the test period of 28 days is reduced to 21 days.
- (c) clause 4.7 ‘*Pressure recovery*’, is not required for fixed units.

#### 6.4 Plant that is designed to detect Hydrogen

(1) Plant which is designed to detect hydrogen must be tested as per with the relevant clauses in AS/NZS 60079.29.1:2008, as amended below:

- (a) clause 5.4.4.2 ‘*Long-term stability (fixed and transportable apparatus – Group I only)*’, is not mandatory.
- (b) clause 5.4.4.3 ‘*Long-term stability (portable apparatus – Group I only)*’, is not mandatory.
- (c) clause 5.4.4.4 ‘*Long-term stability (fixed and transportable apparatus – Group II only)*’, is not mandatory.
- (d) clause 5.4.4.5 ‘*Long-term stability (portable apparatus – Group II only)*’, is not mandatory.
- (e) clause 5.4.24.2 ‘*Other gases*’, is not mandatory.

(2) Plant which is designed to detect hydrogen must be tested as per the following clauses of AS/NZS 4641:2007, as amended below:

- (a) clause 3.3.1, ‘*Portable apparatus*’.
- (b) clause 3.3.2 ‘*Transportable apparatus*’, the test period of four consecutive weeks is reduced to three consecutive weeks.

- (c) clause 3.3.3 'Fixed apparatus,' the test period of 28 days is reduced to 21 days.
- (d) clause 3.24 'Effects of other gases/cross-sensitivity,' must be complied with only where the standard test gas is between 40% and 60% of manufacturer's stated measurement range.
- (e) the apparatus must be exposed to a mixture containing a concentration of hydrogen of between 40% and 60% of manufacturer's stated measurement range and a volume fraction of 200ppm ethane (C<sub>2</sub>H<sub>6</sub>) in air.

#### 6.5 Plant that is designed to detect any other gas

Plant which is designed to detect any other gas must be tested as per the relevant clauses of AS/NZS 4641:2007 as amended below:

- (a) clause 3.3.2 'Transportable apparatus,' the test period of four consecutive weeks is reduced to three consecutive weeks.
- (b) clause 3.3.3 'Fixed apparatus,' the test period of 28 days is reduced to 21 day.
- (c) clause 3.7 'Pressure recovery,' is not required for fixed apparatus.

### 7 Performance standards

#### 7.1 Plant that is designed to detect methane up to and including 5%

- (1) Plant which is designed to detect methane up to and including 5% must comply with the performance requirements in AS/NZS 60079.29.1:2008, as amended below:
  - (a) clause 5.4.8 'Pressure,' the change in the plant indication must not exceed the greater of ± 0.2% methane or ± 35% of the indication at 100 kPa when tested at 80 kPa, 100 kPa and 120 kPa.
  - (b) clause 5.4.10 'Air velocity,' the difference between plant indication at 0 m/s and test conditions must not exceed the greater of ± 0.1% methane or ± 10% of the indication.
  - (c) clause 5.4.15 'Warm-up time,' must comply with manufacturer's claims as stated in the plant operating manual or the requirements of AS/NZS 60079.29.1:2008.
- (2) When tested in accordance with 6.2 (2) (a) and 6.2 (2) (b) above, the difference between the plant indication and the test gas methane concentration must not exceed ±0.2% methane.

#### 7.2 Plant that is designed to detect methane up to and including 100%

- (1) Plant which is designed to detect methane up to and including 100% must comply with the performance requirements in AS/NZS 60079.29.1:2008, as amended below:
  - (a) clause 5.4.8 'Pressure,' the change in the plant indication must not exceed the greater of ± 5% methane or ± 35% of the indication at 100 kPa when tested at 80 kPa, 100 kPa and 120 kPa.
  - (b) clause 5.4.10 'Air velocity,' the difference between plant indication at 0 m/s and test conditions must not exceed the greater of ± 3% methane or ± 10% of the indication.

- (c) clause 5.4.15 'Warm-up time,' must comply with manufacturer's claims as stated in the plant operating manual or the requirements of AS/NZS 60079.29.1:2008.

- (2) When tested in accordance with 6.2 (3) (a) above, the difference between the plant indication and the test gas methane concentration must not exceed ±5% methane.

#### 7.3 Plant that is designed to detect Oxygen tested to AS/NZS 4641:2007

Plant which is designed to detect oxygen must comply with the performance requirements in AS/NZS 4641:2007, as amended below:

- (a) clause 4.24 'Effects of other gases/cross-sensitivity,' the performance requirement for the 10% CO<sub>2</sub> in air test is not mandatory.
- (b) clause 4.14 'Warm-up time,' must comply with manufacturer's claims as stated in the plant operating manual or the requirements of AS/NZS 4641:2007.

#### 7.4 Plant that is designed to detect hydrogen

- (1) Plant which is designed to detect hydrogen must comply with the performance requirements in AS/NZS 60079.29.1:2008 for Group II performance requirements, as amended below:
  - (a) clause 5.4.8 'Pressure,' the change in the plant indication must not exceed the greater of ±5% measuring range or ±35% of the indication at 100 kPa when tested at 80 kPa, 100 kPa and 120 kPa.
  - (b) clause 5.4.15 'Warm-up time,' must comply with manufacturer's claims as stated in the plant operating manual or the requirements of AS/NZS 60079.29.1:2008.
- (2) When tested in accordance with 6.4 (2) (a) and 6.4 (2) (b) above, the plant must comply with the applicable requirements of AS/NZS 4641:2007, as amended below:
  - (a) clause 3.3.1, 'Portable apparatus' the difference between plant indication and the test gas concentration must not exceed the greater of ± 5% of measuring range or ±10% of the indication.
  - (b) clauses 3.3.2 'Transportable apparatus' and clause 3.3.3, 'Fixed apparatus' the difference between plant indication and the test gas concentration must not exceed the greater of ±7% of measuring range or ±20% of the indication.
- (3) When tested in accordance with 6.4 (2) (e), the difference between the plant indication and the test gas hydrogen concentration shall not exceed ±10% of indication.

#### 7.5 Plant that is designed to detect other gases

Plant which is designed to detect other gases must comply with the relevant performance requirements in AS/NZS 4641:2007, as amended below:

- (a) plant that detects nitrogen dioxide or nitric oxide are exempt from requirements of clauses 3.6 'Pressure variation,' 3.7 'Pressure recovery' and 3.9 'Air velocity'.

- (b) clause 4.14 ‘*Warm-up time*’ must comply with manufacturer’s claims as stated in the plant operating manual or the requirements of AS/NZS 4641:2007.

**7.6 Electromagnetic compatibility**

Where AS/NZS 60079.29.1:2008 and/or AS/NZS 4641:2007 mandates plant testing in accordance with AS/NZS IEC 61000.4.3:2013 *Electromagnetic compatibility (EMC) – Testing and measurement techniques – Radiated, radio-frequency, electromagnetic field immunity test*, when tested, the plant must have no loss of function, degradation of performance or spurious alarms.

*circuit tester* means apparatus for testing the continuity, and indicating the condition (resistance) of, a detonator circuit.

*exploder* means a self-contained portable apparatus designed and constructed for producing an electric current for firing detonators.

*exploder tester* means apparatus for testing the output characteristics of an exploder on a routine basis as a means of assessing its continued ability to perform its design function.

*intrinsically safe* means being certified as explosion protected using intrinsic safety techniques as identified in AS/NZS 60079.11:2009 *Explosive atmospheres – Part 11: equipment protection by intrinsic safety (i)* (as amended from time to time) for use in Group I applications.

*Regulation* means the *Work Health and Safety (Mines) Regulation 2014*.

*shot firing apparatus* is a collective term encompassing circuit testers, exploders and exploder testing devices.

*special tool* means a tool that is designed to be used with a specific type of fastener and which is intended to discourage unauthorised interference with the apparatus (not a general purpose tool that is intended to be used on a range of fasteners for instance, pliers, multigrip pliers, shifting spanners, adjustable wrenches, etc.).

**WORK HEALTH AND SAFETY (MINES) REGULATION 2014**

Registration of Shotfiring Apparatus Design Order 2015

I, Douglas Revette, Executive Director Governance, with the delegated authority of the Secretary, Department of Trade and Investment, Regional Infrastructure and Services in pursuance of clause 177 (5) of the *Work Health and Safety (Mines) Regulation 2014* (“the Regulation”) make the following Order.

Dated this 25th day of June 2015.

DOUGLAS REVETTE  
Executive Director Governance  
Department of Trade and Investment,  
Regional Infrastructure and Services

**Explanatory note**

From 1 July 2015, any reference to the Department of Trade and Investment, Regional Infrastructure and Service is a reference to the Department of Industry, Skills and Regional Development in accordance with the *Administrative Arrangements (Administrative Changes—Public Service Agencies) Order (No 2) 2015*.

**REGISTRATION OF SHOTFIRING APPARATUS DESIGN ORDER 2015**

under the

**WORK HEALTH AND SAFETY (MINES) REGULATION**

**2014 1 Name of Order**

This Order is the *Registration of Shotfiring Apparatus Design Order*

2015. 2

**Commencement** commences on 1 July 2015.

**3 Interpretation**

In this Order:

*AS* is a reference to Australian Standards.

*AS/NZS* is a reference to Australian/New Zealand Standards.

*Chief Inspector* is a person appointed under the *Work Health and Safety (Mines) Act 2013*.

**4 Revocation of Requirements for Design Registration for Shot Firing Apparatus used Underground at a Coal Workplace**

Pursuant to clause 177 (5) and clause 34 (5) of Schedule 12 of the Regulation, the *Requirements for Design Registration of Shot Firing Apparatus used Underground at a Coal Workplace* published in *NSW Government Gazette* No 6 of 21 January 2011 at page 124 is revoked, as is any notice revived as a result of this revocation.

**5 Design requirements**

All shotfiring apparatus used in underground coal mines must be designed to:

- (a) withstand, without damage or impairment to correct operational performance, the arduous nature of use below ground; and
- (b) be reliable in performance; and
- (c) not sustain mechanical or electrical damage likely to affect the safe operation of the equipment, when dropped or impacted; and
- (d) ensure that the electrical circuits within the apparatus are adequately insulated from the outer case of the apparatus; and
- (e) ensure that where the exploder and the circuit tester are integrated into a single unit, it is provided with adequate segregation between the circuits of the exploder and the circuit tester, to prevent electrical leakage and/or interference from the exploder to the circuit tester circuits.