

WORK HEALTH AND SAFETY (MINES AND PETROLEUM SITES) REGULATION 2022

Registration of Design of Plant Used to Determine or Monitor the Presence of Gas Order 2022

I, **Garvin Burns**, Chief Inspector, with the delegated authority of the Secretary, Regional NSW, pursuant to section 187(5) of the *Work Health and Safety (Mines and Petroleum Sites) Regulation 2022*, make the following Order.

Dated this 10th day of October 2022

Garvin Burns
Chief Inspector
Regional NSW

1. Name of Order

This Order is the *Registration of Design of Plant Used to Determine or Monitor the Presence of Gas Order (No.2) 2022*.

2. Commencement

This Order commences on the day it is published in the NSW Government Gazette.

3. Interpretation

In this Order:

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

equipment with integral monitor means equipment that provides meter indication, alarm functions and/or output contacts using a monitor which is within or directly mounted to the equipment housing.

equipment with remote monitor(s) means a remote monitor control unit, the remote monitor and the interconnecting communications medium. The communications medium may be via copper cable, fibre optic link or some other form such as a radio link.

equipment with integral sensor(s) as defined in clause 3.2.14 in AS/NZS 60079.29.1:2017.

equipment with remote sensor(s) means a gas detection control unit, the remote sensor and the interconnecting communications medium. The communications

medium may be via copper cable, fibre optic link or some other form such as a radio link.

flammable gas as defined in clause 3.1.3 in AS/NZS 60079.29.1:2017.

gas detection control unit as defined in clause 3.2.12 in AS/NZS 60079.29.1:2017.

integral monitor means monitor which is within or directly mounted to the equipment housing.

integral sensor as defined in clause 3.3.3 in AS/NZS 60079.29.1:2017.

monitor as defined in clause 1.3.3.1 in AS/NZS 4641:2018.

plant means electrically powered hand-held plant, fixed installations and installations on mobile plant used to determine or monitor the presence of gas if they are used at an underground coal mine (but does not include tube bundle systems where the analyser is installed at the surface).

remote monitor as defined in clause 1.3.3.2 in AS/NZS 4641:2018.

remote monitor control unit means equipment intended to provide display indication, alarm functions, output contacts and/or alarm signal outputs or any combinations when operated with remote monitor(s).

remote sensor as defined in clause 3.3.4 in AS/NZS 60079.29.1:2017.

sensing element as defined in clause 3.3.1 in AS/NZS 60079.29.1:2017.

sensor as defined in clause 3.3.2 in AS/NZS 60079.29.1:2017.

toxic gas as defined in clause 1.3.1.11 in AS/NZS 4641:2018.

4. Revocation

The *Registration of Design of Plant Used to Determine or Monitor the Presence of Gas Design Order 2022* published in the NSW Government Gazette No 420 of 9 September 2022 revoked.

5. Design requirements

5.1. Except as provided in paragraphs 5.2 and 5.3, all plant must be designed in accordance with the following:

- (a) For plant designed for flammable gases:
 - (i) The plant must be designed to comply with the design requirements of the relevant parts of AS/NZS 60079.29.1:2017 Explosive atmospheres – Gas detectors – Performance requirements of detectors for flammable gases;

- (ii) the plant must be designed to provide a conditioned electronic signal or output indication that can be used by the mine operator to determine the level of a gas.
 - (iii) the plant must be designed as:
 - equipment with integral sensor(s), or
 - equipment with remote sensor(s), or
 - equipment with combinations of integral and remote sensor(s).
 - (iv) sensor(s) must include the protective housings and any filters associated with protecting the sensing element.
- (b) For plant designed for oxygen and toxic gases:
- (i) the plant must be designed to comply with the design requirements of the relevant parts of – AS/NZS 4641:2018 Electrical equipment for detection of oxygen and other gases and vapours at toxic levels – General requirements and test methods.
 - (ii) the plant must be designed to provide a conditioned electronic signal or output indication that can be used by the mine operator to determine the level of a gas.
 - (iii) the plant must be designed as:
 - equipment with integral monitor(s), or
 - equipment with remote monitor(s), or
 - equipment with combinations of integral and remote monitor(s).
 - (iv) monitor(s) must include the protective housings and any filters associated with protecting the sensing element.

5.2. Where a design does not fully comply with the requirements in paragraph 5.1, the designer must specify the published technical standards or the engineering principles used to identify controls, in accordance with the hierarchy of risk control measures in Part 3.1 of the *Work Health and Safety Regulation 2017*, that have been incorporated in the design to achieve at least an equivalent level of safety as the requirements of paragraph 5.1.

5.3. If the design of plant that is registered under Part 5.3 of the *Work Health and Safety Regulation 2017* is altered and the alteration may affect health or safety:

- (a) the altered parts of the plant must be designed to comply with the design requirements in paragraphs 5.1— 5.2 of this Order.
- (b) an assessment must be undertaken, and documented, by the designer to assess the impact that the design alteration has on unaltered parts of the plant.
- (c) where the assessment undertaken in paragraph 5.3(b) shows there has been a reduction in the effectiveness of existing control measures of

any other parts of the plant, that is, there has been a detrimental effect on health and safety caused by the alteration, these parts must comply with the design requirements in paragraphs 5.1 – 5.2 of this Order.

- (d) any parts of the plant which are not affected by the alteration must continue to comply with the design requirements of the design order that was in effect on the date that the registration for the design of the plant was granted.

5.4. All gas detecting plant must comply with the relevant parts of section 81(2) 'Use of plant in hazardous zone (explosion-protection required)', of the *Work Health and Safety (Mines and Petroleum Sites) Regulation 2022*.

6. Testing and performance requirements

6.1. Plant to be tested must include all component parts, including cables, that enables a conditioned electronic signal or output indication to be provided so that a mine operator can determine the level of a gas that the sensor, or monitor, is exposed to. Where digital output signals are provided, this includes any software drivers and the communications protocols necessary for the testing facility to verify the performance of the plant.

6.2. Except as provided in paragraph 6.3, all plant must be tested and meet the relevant performance requirements as follows:

- (a) For plant designed for flammable gases:
 - (i) AS/NZS 60079.29.1:2017 Explosive atmospheres – Gas detectors – Performance requirements of detectors for flammable gases;
 - (ii) when tested for Electromagnetic compatibility (refer to 5.4.21.1 of AS/NZS 60079.29.1:2017), plant fitted with catalytic combustion sensors for measuring up to and including 5% methane must be exposed to the standard test gas during testing.
 - (iii) when tested for Electromagnetic compatibility (refer to 5.4.21.2 of AS/NZS 60079.29.1:2017), performance Criterion A must be met,
 - (iv) when plant with a measuring range up to and including 5% methane is fitted with catalytic combustion sensors, the plant must also be tested by exposure of the sensors to a volume fraction of 2.0 ± 0.2 % methane in air mixture containing a volume fraction of 50ppm hydrogen sulphide for 20 minutes and a reading taken. The difference between the plant indication and the test gas methane concentration must not exceed ± 0.2 % methane.
- (b) For plant designed for oxygen and toxic gases:
 - (i) AS/NZS 4641:2018 Electrical equipment for detection of oxygen and other gases and vapours at toxic levels – General requirements and test methods.

- (ii) for hydrogen sulphide, nitrogen dioxide and nitric oxide monitors, clauses 4.6 'Pressure variation', 4.7 'Pressure recovery' and 4.9 'Air velocity', as detailed in AS/NZS 4641:2018, are varied and are only required to be undertaken in clean air (without the standard test gas).
- (iii) for hydrogen sulphide, nitrogen dioxide and nitric oxide monitors, clause 4.12.3 for Vibration testing of portable and machine mounted monitors, as detailed in AS/NZS 4641:2018, is varied and are only required to be undertaken in clean air (without the standard test gas).

6.3. If the design of plant that is registered under Part 5.3 of the *Work Health and Safety Regulation 2017* is altered, and the alteration may affect health or safety, the altered parts of the plant, including those parts that may have been redesigned due to detrimental effects identified in the assessment undertaken in paragraph 5.3(b) above, must be tested and meet the performance requirements in paragraph 6.2 of this Order.

6.4. Any parts of the plant which are not affected by the alteration must continue to comply with the performance requirements of the design order that was in effect on the date that the registration for the design of the plant was granted.

7. Test facility

7.1. The test facility used for testing the plant must be a test facility which is independent of the designer, manufacturer or supplier.

7.2. The test facility must have test equipment, equipment calibration (traceable to the International System of Units (SI) by reference to national measurement standards), quality processes and work methods for performing the specific tests described in the standards referred to in this Order. This may be:

- (a) the Mine Safety Laboratory NSW; or
- (b) a test facility that is accredited by the National Association of Testing Authorities (NATA); or
- (c) where demonstrated to the regulator that a NATA-accredited facility is not available,
 - (i) is accredited by an organisation that is a signatory to the ILAC MRA (International Laboratory Accreditation Cooperation Mutual Recognition Arrangement); or
 - (ii) is a suitably qualified and experienced testing facility along with past test experience with gas detection and monitoring systems, which has been independently audited within the last 2 years.

8. Determination of applications for registration of design made before commencement of this Order

If an application for the registration of design of a plant made in accordance with clause 250 of the *Work Health and Safety Regulation 2017* to which the standards specified in the *Registration of Design of Plant Used to Determine or Monitor the Presence of Gas Design Order 2022* applies is made before the commencement of this Order, and the application has not been finally determined before that commencement, the application is to be determined as if this Order had not commenced.