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## Confined spaces – gas detection

This safety bulletin provides safety advice for the NSW mining industry.

### Issue

During planned inspections on confined spaces at coal mines, the NSW Resources Regulator has identified issues with the selection, implementation, use and maintenance of gas detection equipment used to manage risks associated with confined spaces entry.

### Circumstances

NSW Resources Regulator inspectors have embarked on a planned inspection program based on principal hazards, with entry to and working in confined spaces being one such hazard.

During 2018, 27 confined space inspections have taken place across the state, including at surface coal mines, work areas at the surface of underground coal mines and coal handling and preparation plants.

### Inspection findings

Inspectors have identified a range of issues during the inspections including:

- risks not being adequately identified during the risk assessment process, and consideration not being given to all flammable or toxic gases that may be present in confined spaces
- gas detectors not being introduced to site through standard processes and change management. At some sites the statutory electrical engineer did not review the equipment's explosion-protection certification or verified the equipment was fit for purpose
- contractors undertaking confined space work using their own gas detectors but this equipment not always going through a full introduction to site process, such as certification review, calibration checks and alarm setpoints checks and confirmation as being consistent with site permit and plans
- detectors found to have alarms set to different values to those identified in the confined spaces permit and management plan. In some cases, the second alarm setpoints were set way too high, i.e. 200 PPM carbon monoxide.
- some mines mandating operating in percentages of the lower explosive limit (LEL), consistent with the Work Health and Safety Regulation 2017, some mines calibrating their monitors in percentages of the volume of methane, while others are relying on underground coal alarm limits
- management and workers being unfamiliar with the equipment and unable to adequately demonstrate alarm setpoints and bump test or challenge test the equipment
- several sites having no facilities for bump tests/challenge tests of confined space gas detectors (manufacturer requirements and AS/NZS 2290.3:2018)

- calibrations of some equipment by NATA-accredited laboratories not being undertaken at appropriate frequencies
- some confined space management systems not distinguishing between 'continuous' and 'regular' monitoring even though the Work Health and Safety Regulation 2017 requires continuous monitoring where flammable gas levels are equal to or greater than 5% but less than 10% of the lower explosive limit for the gas.

## Recommendations

The Resources Regulator recommends that mine operators ensure:

- the correct selection of gas detection equipment that matches confined space environment hazards identified through a risk assessment, so they can detect and alarm all relevant flammable and toxic gasses that may be present
- all gas detectors used in confined spaces on the surface of a mine are appropriately certified and meet the requirements of the electrical engineering control plan, including having been through an 'introduction to site process' and sign off by the mine statutory electrical engineer
- mine sites maintain gas detectors in accordance with manufacturer's recommendations and AS/NZS 2290.3:2018
- gas detectors are bump/challenge tested every time before use to ensure correct readings of gasses and operation of alarms
- gas detector alarms are set up as per the confined spaces management plan, permit and any specific confined space entry risk assessment
- where confined space plans and permits reference LEL, detectors are configured in percentages of the LEL and not percentages of the volume of methane (100% LEL is 5% volume of methane and therefore 10% LEL is 0.5% volume of methane)
- personnel working in confined spaces are trained and assessed as competent in the use of gas detection equipment and the management systems (including permits and procedures) used for confined spaces entry at each mine where they undertake confined space work activities
- terminology used in management plans and site permits should be well defined in plans and permits and not left to the workers to interpret.

**NOTE:** Please ensure all relevant people in your organisation receive a copy of this safety bulletin, and are informed of its content and recommendations. This safety bulletin should be processed in a systematic manner through the mine's information and communication process. It should also be placed on the mine's notice board.

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