



CRITICAL RISK STANDARD

Underground ventilation and safe atmospheres

1. INTENT

This standard identifies the controls required to manage the risk associated with underground atmospheric contaminants and atmospheres.

2. APPLICATION

This standard applies to all Perenti Group underground projects.

3. REQUIREMENTS

3.1 PEOPLE

- Each project must have an appointed and appropriately qualified Underground Ventilation Officer.
- All personnel must be trained in ventilation systems relevant to any work they are to undertake.
- All personnel must be trained in the safe use of air monitoring devices required for work they are to undertake.
- All personnel must ensure ventilation is adequate in their work area prior to commencement of any task.
- Defects identified in the ventilation system must be rectified immediately or reported to the Underground Shift Supervisor if rectification is not possible.
- Ventilation control devices (door, regulator, brattice) must not be modified without authorisation from the Underground Shift Supervisor or Underground Ventilation Officer.
- The Underground Shift Supervisor must take and record ventilation readings at all active work areas for which they are responsible, each shift or as prescribed in the Project Management Plan.

3.2 SYSTEMS AND PROCEDURES

- Risks associated with hazardous atmospheres together with the required controls, must be included in the project risk assessment for each project.
- Ventilation management must be included in the Project Management Plan for each project, prepared by a competent person, and must include as a minimum:
 - Ventilation requirement table;
 - Sufficient volume, velocity and quality of air required to prevent hazardous atmospheres in different operating environments;
 - A program for monitoring and testing of the ventilation system which includes but is not limited to:
 - "When" monitoring must be undertaken;
 - "What" must be monitored;
 - "Where" monitoring is to be undertaken;
 - "Who" is responsible to undertake the monitoring;
 - "How" the monitoring is to be performed.

- Specific airborne contaminants and airborne hazardous materials that exist on site with reference to:
 - Specific hazard management plans and Trigger Action Response Plans (TARPS);
 - Training programs for identification, response and control measures for hazardous materials that may be encountered (e.g. irrespirable atmospheres, or atmospheres which may contain concentrations of gas or dust within explosive limits).
- Working in hot and humid conditions procedure requirements;
- Procedures to enter or work in a confined space that are consistent with the requirements of the Perenti Confined Space Critical Risk Standard requirements.

3.3 PLANT AND EQUIPMENT

- Ventilation fans must be designed, constructed and installed to be fit for purpose and prevent recirculation.
- There must be a warning system in place to alert personnel when a primary ventilation failure has occurred.
- Appropriate instruments and equipment must be available to conduct gas detection and atmospheric monitoring.
- All measuring equipment must be maintained and calibrated to manufacturers' specifications.
- Records of testing and calibration must be kept for each item of calibrated equipment.
- A register of all underground diesel units must be maintained on site and must include the ventilation requirements for each diesel unit.
- Where provided, enclosed cabins and cabin air conditioning must be maintained to OEM specification.
- Exhaust treatment devices must be fitted to underground diesel engines rated at 125kW or greater.
- All diesel equipment will be tested in accordance with the ISG Procedures for Diesel Particulate Testing, Filter Maintenance and Gas Testing.
- All ventilation ducting must be installed and maintained to minimise loss and ensure delivery of required air volumes.
- Flammable storage, fuel dispensing, workshops, sub-stations and explosive storage should, where practicable, be placed in exhaust airway locations.