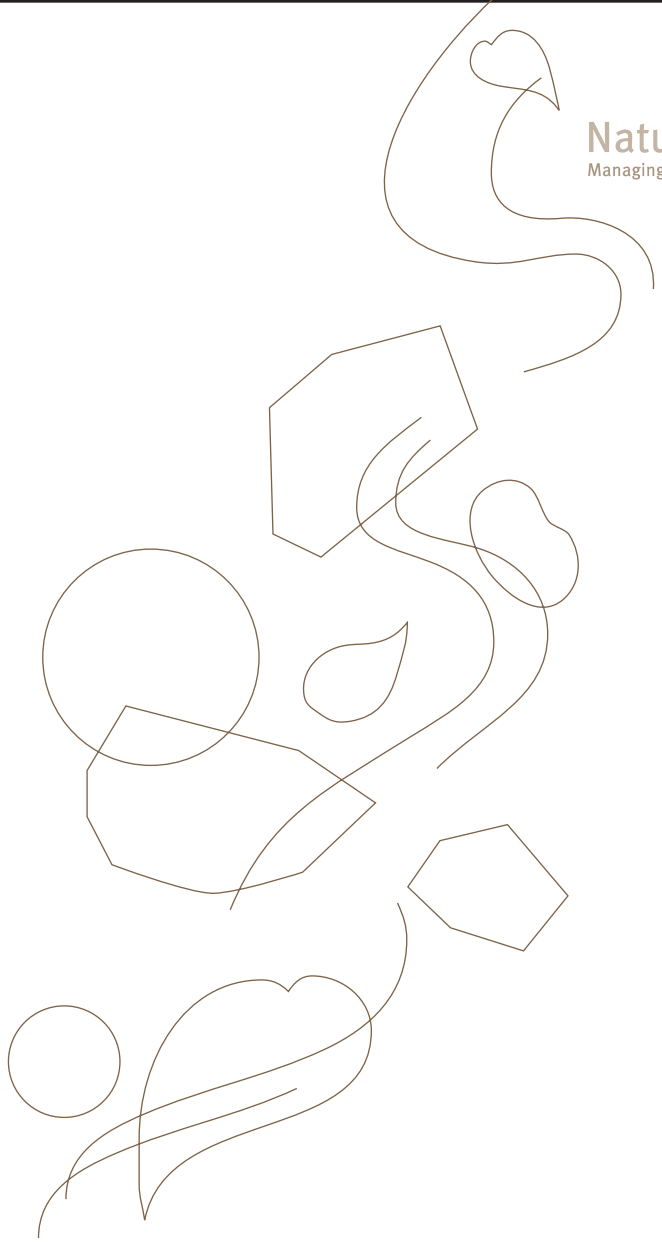

# Underground non flameproof diesel vehicles

## Coal Mining Safety and Health Act 1999

Recognised Standard – 04

***This document is issued in accordance with PART 5—RECOGNISED STANDARDS and Section 37(3) of the Coal Mining Safety and Health Act 1999.***

***"PART 5—RECOGNISED STANDARDS***

***Purpose of recognised standards***

***71.A standard may be made for safety and health (a "recognised standard") stating ways to achieve an acceptable level of risk to persons arising out of coal mining operations.***

***Recognised standards***

***72.(1) The Minister may make recognised standards.***
***(2) The Minister must notify the making of a recognised standard by gazette notice.***
***(3) The chief executive must keep a copy of each recognised standard and any document applied, adopted or incorporated by the recognised standard available for inspection, without charge, during normal business hours at each department office dealing with safety and health.***
***(4) The chief executive, on payment by a person of a reasonable fee decided by the chief executive, must give a copy of a recognised standard to the person.***

***Use of recognised standards in proceedings***

***73.A recognised standard is admissible in evidence in a proceeding if—***

***(a) the proceeding relates to a contravention of a safety and health obligation imposed on a person under part 3; and***
***(b) it is claimed that the person contravened the obligation by failing to achieve an acceptable level of risk; and***
**(c)** ***the recognised standard is about achieving an acceptable level of risk.***

***37.(3)….if a recognised standard states a way or ways of achieving an acceptable level of risk, a person discharges the person's safety and health obligation in relation to the risk only by—***
***(a) adopting and following a stated way; or***
***(b) adopting and following another way that achieves a level of risk that is equal to or better than the acceptable level."***

**Where a part of a Recognised Standard or other normative document referred to therein conflicts with the Coal Mining Safety and Health Act 1999 or the Coal Mining Safety and Health Regulation 2001, the Act or Regulation take precedence.**

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## This recognised standard is issued under the authority of the Minister for Natural Resources and the Minister for Mines

***[Gazetted 18 July 2003]***

**ISBN …….**



| Version No | Date |
|---|---|
| 1 | 18 July 2003 |

# RECOGNISED STANDARD 04
# UNDERGROUND FLAME PROOF DIESEL VEHICLES

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# RECOGNISED STANDARD No 04

# UNDERGROUND NON FLAMEPROOF DIESEL VEHICLES

## 1. PURPOSE

The purpose of this standard is to establish the minimum standards for the construction and management controls for a non flameproof diesel vehicle in an underground coal mine.

## 2. SCOPE

This standard applies to diesel powered vehicles that are fire protected, but not explosion protected, in the underground operations of a coal mine. This standard does not apply to vehicles for use on the surface of an underground coal mine.

## 3. DEFINITIONS

NERZ: Negligible explosive risk zone of an underground coal mine.

*Note! Other areas of the mine are designated ERZ1 and ERZ0, and are areas where Methane is present or is likely to be present in concentration in excess of 0.5% and 2% respectively*

## 4. TECHNICAL GUIDANCE

### 4.1 General

Vehicles that are restricted to the NERZ of an underground coal mine do not have to conform to explosion protection requirements. However, there are other risks introduced by this class of vehicle and this standard identifies management strategies and construction requirements that will effectively control these risks. The identified controls are the minimum requirements and must be complemented by a risk assessment conducted by the mine, prior to introduction of this class of vehicle. The risk management process may require the use of additional control measures.

### 4.2 Management Controls

Each mine or user is to undertake a risk assessment, using an industry accepted approach, which will address the special risks of operating this class of vehicle. The risk assessment and any related investigation shall specifically address the following.

1) The likelihood of an unexpected change in the Explosion Risk Zone classification.
2) The use of signage and other schemes to prevent the vehicles operating in other than a NERZ.
3) A system to make the vehicle operator aware of ventilation stoppages or other environmental changes that might pose a risk to the operation of the vehicle.
4) Maximum vehicle speeds.
5) Means where the engine can be started from an external power source.

### 4.3 Operational Controls

Each mine is to implement management systems that address the output of the risk assessments and have documented systems that;

1) Ensures operators and users are trained in the operation and maintenance of this class of vehicle.
2) Ensures any vehicle modifications are supported by a risk assessment that has included a review of any previous risk assessment.
3) Ensures the maintenance system includes;

a) Dynamometer testing of the vehicle.

*Note! To ensure that exhaust gas emission concentrations are below acceptable limits and surfaces, requiring temperature control, do not exceed 150$^{o}$C.*

b) Examinations to ensure electrical systems are maintained to their design standards.
c) Tests to ensure the location control system remains functional.
d) Routine testing of the installed Methanometer and its related engine shutdown system.
e) Periodic tests of the vehicle speed management system.
f) Systems to control computer software including;
    i) Version in use and upgrades
    ii) Security and modification
g) Routine removal of accumulated coal dust from surfaces requiring temperature control.

*Note! Good practice would include washing of the engine package, brakes, head, tail, reversing and stop light bulbs.*

4) Ensures that a vehicle does not remain underground if it has a damaged head, stop or tail light fitting.
5) Ensures that the vehicle battery is not replaced while the vehicle is underground.
6) Provides means to remove a vehicle to the surface where the vehicle is unable to be driven from the mine.
7) Provides a permanent record of events where the vehicle was automatically stopped whilst attempting to enter an ERZ1 or ERZ0

### 4.4 Vehicle Construction Controls

1) Each vehicle type must be subjected to extensive dynamometer testing under load to confirm suitability of vehicle design and identify any parts of the vehicle where temperatures in excess of 150$^{o}$C.may occur
2) A temperature monitoring and control system must be fitted to ensure the surface temperatures on the vehicle do not exceed 150$^{o}$C.
3) Exhaust gases must not exceed 150$^{o}$C. at their point of exit.
4) An automated engine shutdown system, independent of the operator, if 150$^{o}$C is exceeded at any temperature monitor fitted to the vehicle.
5) A location control system to prevent the vehicle entering a zone other than a NERZ. The system components may be installed in the mine or mounted on the vehicle. This system must include automatic engine shutdown.
6) Permanently mounted, automatically operating, engine bay fire suppression system.
7) Hand held fire extinguisher mounted on the vehicle.
8) Oil immersed brakes braking system that limits the surface temperature to less than 150$^{o}$C.
9) Vehicle horn(s) rated at 95 dBA minimum.
10) Audible vehicle reversing alarm.
11) Vehicle road speed controlling system.
12) Powered fuel solenoids.
13) Seat belts fitted at all vehicle seating positions.
14) A system to prevent engine start while the vehicle is in gear.
15) Unmodified electrical circuits to conform to the OEM standard (as at the date of manufacture) or to the appropriate parts of AS 4242.
16) Any electrical circuit modification is to conform to the relevant parts of AS 4242
17) Battery isolation to be fitted.
18) Battery to be enclosed, to limit access and provide short circuit protection. The battery box and any related isolator will be hazardous area protected to AS 2380.6.
19) Permanently mounted vehicle headlights and reversing lights.
20) The bulb wattage must be selected to ensure that the glass temperature cannot exceed 150$^{o}$C or physical and dust protection is to be provided. A label to be attached, in proximity to each bulb, stating the maximum bulb wattage.

21) A system to allow electrically unprotected electrical circuits to be isolated when not required
22) Alternative engine stop/isolation switch to be fitted.
23) An external power source connection shall include an isolator and means to prevent inadvertent reverse polarity.
24) The system for temperature control, vehicle mounted location control and speed control must be fail safe.
25) The Methanometer:
    a) At 0.25%, it will give a visual alarm.
    b) At 0.5%, it will cause immediate engine shutdown and electrical circuit isolation.
    c) Any circuits that remain powered after a Methanometer triggered shutdown will be hazardous area protected to Ex ia as defined in AS 2380.7

## 5. REFERENCE STANDARDS

The following documents are referred to in this standard

AS 2380.6 – 1988 – Electrical equipment for explosive atmospheres - Explosion protection techniques - Increased safety
AS 2380.7 – 1987 – Electrical equipment for explosive atmospheres - Explosion protection techniques - Intrinsic safety
AS/NZ 4242 – 1994 – Earth moving machinery and ancillary equipment for use in mines - Electrical wiring systems at extra-low voltage