

DATE: MARCH 2018

## Diesel particulate filter seals critical for effective control of diesel particulate matter

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

### The issue

During recent assessment activities, NSW Resources Regulator inspectors identified instances in which underground coal mines have been operating explosion protected diesel engine systems (ExDES) without effective sealing of removable diesel particulate exhaust filters (removable exhaust filters).

Ineffective sealing of removable exhaust filters results in increased quantities of diesel particulate matter (DPM) in the mine's atmosphere. This exposes workers to higher levels of DPM.

### Circumstances

On two separate occasions during recent assessment activities, inspectors have identified ExDES operating underground where the exhaust has been bypassing the installed removable exhaust filter(s).

The ineffective seals were found when the exhaust back pressure did not increase (from idle) when the engine was revved to high idle. This is indicative of a leak in the removable filter.

At one mine, several transport vehicles had correct removable exhaust filters installed, however, the housings were not fitted with the necessary seals to provide the clamping and sealing required to ensure all engine exhaust gas was passing through the removable exhaust filter.

At another mine, transport vehicles and Load Haul Dump (LHD) vehicles from the same original equipment manufacturer (OEM) used similar but slightly different filters for each vehicle. The correct man transport filter has a sealing ring installed to either end, whereas the LHD vehicle element does not have seals. Both filters are the same diameter, but not the same length, and were inadvertently interchanged in an LHD. In another instance at the same mine, a third type of plant had the correct filters installed, but the seals that were supposed to be fitted to the housing were missing or removed.

## Recommendations

The risk associated with exposure to diesel exhaust particulate emissions is well known. Mine operators need to ensure diesel engine systems are maintained using parts in compliance with the notice of design registration. Engines should be maintained with regard to baseline emissions and the mine environment is monitored to ensure the risk is being appropriately managed.

Mines should:

- review the certificate of design registration (MDR) documentation for each type of diesel engine system in service at the mine to ensure the diesel particulate filter for each type is known, understood and compliant. (Note that different MDRs may apply to the same machine type, depending on when the machine was built.)
- be familiar with the limitations of alternative filter options from the OEM or alternative filter suppliers including differences in filter performance affecting minimum ventilation rates and any 'greening in' periods. Note: alternative suppliers must hold a notice of alteration to diesel engine system design
- review information provided by the ExDES manufacturer to ensure any upgrades or changes have been addressed at the mine site
- review that training information provided to supervisors and workers relating to diesel particulate filters is up-to-date and relevant
- conduct inspections and tests as necessary to ensure the effective sealing of exhaust filters when installed to each item of diesel plant
- ensure different filter types are clearly identifiable and to which ExDES it may be installed is also identifiable
- ensure each ExDES clearly identifies the filter or filters that may be used
- communicate recommendations in this safety bulletin directly to workers.

Other relevant information related to diesel exhaust emissions:

- Fact sheet [Diesel exhaust emissions – underground coal mines](#)
- SB17-07 [Minimum air quantities for diesel engines in underground coal mines](#)
- SB17-05 [Reuse of removable exhaust filters on explosion-protected diesel engines](#)

**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 noticeboard.

Issued by  
**Garvin Burns**

**Chief Inspector of Mines****Appointed pursuant to *Work Health and Safety (Mines and Petroleum Sites) Act 2013***

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CM9 reference	PUB18/101
Mine safety reference	SB18-03
Date published	21 March 2018
Authorised by	Garvin Burns, Chief Inspector of Mines