



SAFETY BULLETIN NO: 53

PARTICULATE EMISSIONS FROM LOW SULPHUR DIESEL FUEL AND THEIR HEALTH EFFECTS

SUMMARY OF CURRENT POSITION

Western Australia recently became the first State in Australia to enact standards for sulphur content in diesel fuel, dropping the maximum level to 500 parts per million.

The Commonwealth Government will soon follow with National Fuel Quality Standards, which adopt European standards that progressively drop the sulphur content in Australian diesel fuel to 50 ppm by 2006/7.

These actions are being taken because of the overwhelming evidence worldwide, that lowering sulphur levels provides long term benefits to the community. Lower sulphur levels reduce sulphur dioxide and diesel particulate levels and improve exhaust odour.

These benefits are particularly noticeable to workers in sectors such as the underground mining industry. The Mines Safety and Inspection Regulations include specific provisions for the operation of diesel engined units in underground mines. Included in these provisions is a requirement to have turbo charged units, and all units rated at 125KW or more, fitted with exhaust treatment devices.

The most widely used treatment devices, are catalytic converters in conjunction with ceramic particulate filters. These devices which greatly reduce exhaust contaminants, will function even more effectively with the lower diesel particulate load.

However, some media articles in recent weeks suggested that ultra fine particles in diesel exhaust emissions increase with lower sulphur levels and that these in turn may cause a greater health risk.

No scientific evidence has been presented to back these claims and they are widely regarded by occupational health authorities and other professionals as only speculation.



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Nevertheless, as a result of these comments, extensive research is currently being undertaken within Australia and overseas, concerning ultra fine particles of diesel particulate matter and low sulphur levels in diesel fuels.

The Western Australian Government has also established a Senior Officers Network with representatives from key Government agencies. This Network is specifically tasked to review particulate emissions from low sulphur diesel and their health effects.

While the Network is still in the process of collecting data, extensive state-of- current knowledge documentation has been gathered to date in this area. A study of this documentation and contact with experts in the field in Australia and overseas have not, to date, shown any confirmation that use of low sulphur diesel produces ultra fine particles that cause adverse health effects.

OPERATING AND MAINTENANCE PRECAUTIONS FOR DIESEL ENGINES IN UNDERGROUND MINES

In order to minimise particulate emissions, it is necessary that all diesel engines are regularly and properly maintained and serviced in accordance with the manufacturers' specifications. This is of particular importance with regard to the fuel supply and fuel metering systems.

Should any significant change in engine performance or in exhaust quality be noticed, the unit should be withdrawn from service and checked to establish that engine and fuel management systems are performing as designed.

The most effective control on particulate emission (for any given fuel quality) is the ceramic filter used in conjunction with the catalytic converter. It is therefore of primary importance that these filters are serviced regularly to maintain effectiveness.

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