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Title

Robust Control of Diesel Engine Particulate Filter Technology in Underground Coal Mining

Abstract

The need to protect workers from diesel particulate matter (DPM) had lead the underground coal mining industry to install disposable filter systems on their vehicles. While the disposable filters are efficient at removing significant DPM, the following major issues have arisen:

- High cost of operations. Disposable filters cost $250-300/each and need to be changed at least once per shift resulting in an estimated cost of up to $164M/year, in filters alone, to the NSW underground coal mining industry.
- Improper installation, damaged seals and lack of installing a new filter when the old filter is removed means that workers are still being exposed to excessive amounts of DPM.

ACARP, the Australian Coal Association Research Program, funded project C25073 to evaluate the suitability of conventional on-road heavy duty diesel wall-flow filter systems to be adapted for use in underground coal operations at a proof-of-concept (PoC) level.

One of the key benefits with the use of a wall-flow DPF system is its tamper-proof design mitigating the risk of operating unfiltered diesel plant in poorly ventilated areas. Elimination of the need for continual replacement of disposable filters provides the underground coal sector with significant operational savings estimated to be up to 80% of the incumbent technology.

The follow-on ACARP project C26070 has progressed the industrialisation of the system with additional site work, assessment of system robustness and the embedding of real-time, and near-real-time, monitoring technology.