



Mines Safety Significant Incident Report No. 177

Burns from hydrocarbon gas fire in truck air conditioning system

Summary of incident

While starting a haul truck, the operator reported hearing a loud bang when the air conditioning system vents blew out, followed by a flash and flame. He received minor burns to his chest and arms. Nylon components of his clothing, including the fly net on his hat, melted. He was treated on-site.

The original R134a gas was removed from the air conditioning system and had been replaced with M30 hydrocarbon gas.

Probable causes

Direct

- The original equipment manufacturer (OEM) had installed the approved R134a gas in the air conditioning system. The R134a gas had been removed and replaced with M30 gas, which is a hydrocarbon with an increased fire risk because of the lower explosive limit (LEL) and, therefore, is not approved by the manufacturer.

Contributory

- Lack of awareness of the increased risk of fire when hydrocarbon gases are substituted in air conditioning systems.
- The air conditioning gas supply connections were not secure, allowing gas to leak from the system into the housing.
- The air conditioning fan, which is not intrinsically safe, is likely to have provided an ignition source when the vehicle was turned on.

Action required

Given manufacturers have not approved the use of these refrigerants, mine management should perform a full risk assessment of such practices to ensure fire risks are addressed, and the integrity of air conditioning systems is maintained, incorporating adequate ventilation and appropriate leak detectors.

Further information

Hasse, V., 2010, Guidelines for the Safe Use of Hydrocarbon Refrigerants, Deutsche Gesellschaft für Technische Zusammenarbeit (German Technical Cooperation), Eschborn, Germany, 320 pp.
Available at www.ubf-aca.be/pdf-en/Proklima%20guidelines%202010.pdf

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18 April 2012