



Dangerous Goods Safety Bulletin No. 0517

Suitability of dry chemical powder fire extinguishers when transporting explosives and other dangerous goods

Background

Both the *Australian Code for the Transport of Dangerous Goods by Road and Rail* (ADG) and the *Australian Code for the Transport of Explosives by Road and Rail* (AEC) require transport companies to carry dry chemical powder (DCP) fire extinguishers when transporting dangerous goods.

There have been two incidents in Western Australia in the past two years where DCP fire extinguishers have not effectively extinguished a brake or tyre fire on a vehicle transporting ammonium nitrate (AN). In both cases, these were the only type of fire extinguisher carried and the fire reignited shortly afterwards. The vehicles involved had been regularly serviced and well maintained.

In the first incident, the driver used all four DCP extinguishers on the vehicle. When the fire reignited, an exclusion zone was set up around the vehicle to let the fire burn itself out – fortunately without further incident. In the second incident, after the use of two DCP extinguishers, passing motorists assisted the driver in effectively extinguishing the fire by providing two foam fire extinguishers and water.

Summary of hazard

A fire on a vehicle transporting dangerous goods can pose a risk to the load and its containment, the integrity of the vehicle, as well as people, property and the environment. For example, when AN or explosives are involved in a fire there is the potential for detonation of the load. Additionally, AN has a low melting point and when molten it becomes both shock sensitive and unpredictable.

Note: In September 2014, a road train carrying AN left the road on approach to the road bridge at Angellala Creek, Queensland. The prime mover caught fire and the load of AN exploded an hour and 17 minutes later, injuring eight people and extensively damaging nearby infrastructure.

Contributory factors

Although DCP fire extinguishers are effective, they do not remove the heat from metal and rubber, which can lead to reignition.

Note: DCP extinguishers contain a very fine powder that acts as a blanketing agent preventing access to the oxygen required to support the fire. However, it does not remove the heat from the medium (e.g. tyre or brake), thus reignition is possible when there is a break in the DCP coverage.

Actions required

The ADG and AEC codes only require prime contractors to carry DCP fire extinguishers. These codes are mandated by the *Dangerous Goods Safety Act 2004*, however under this Act, there is also a duty to minimise risk.

In light of these recent incidents, the Department of Mines, Industry Regulation and Safety has recommended to the National Transport Commission (NTC) that vehicles transporting security sensitive ammonium nitrate (SSAN) carry water-based fire extinguishers in conjunction with DCP fire extinguishers.

It is strongly recommended that companies transporting SSAN, explosives and other dangerous goods:

- review the number and type of fire extinguishers carried on their vehicles to ensure they are appropriate for likely scenarios the driver may encounter (e.g. tyre and brake fires)
- consider carrying water-based fire extinguishers (i.e. foam, water) in conjunction with the required DCP fire extinguishers.

Note: Water-based fire extinguishers can be used to quench the heat in the system once the fire has been extinguished with DCP fire extinguishers.

- consider providing refresher training to drivers in the use of fire extinguishers in emergency situations.

Further information

- National Transport Commission, Australian Code for the Transport of Dangerous Goods by Road and Rail, Edition 7.5 (ADG Code)
www.ntc.gov.au/heavy-vehicles/safety/australian-dangerous-goods-code/
- Safe Work Australia, National codes of practice (prior to WHS laws), Australian Code for the Transport of Explosives by Road or Rail, 3rd edition (AEC3)
www.safeworkaustralia.gov.au/resources_publications/allitems
- Business Queensland, Angellala Creek significant incident investigation,
www.business.qld.gov.au/industries/mining-energy-water/explosives-fireworks/safety-security/significant-incident-reports/angellala-creek

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