

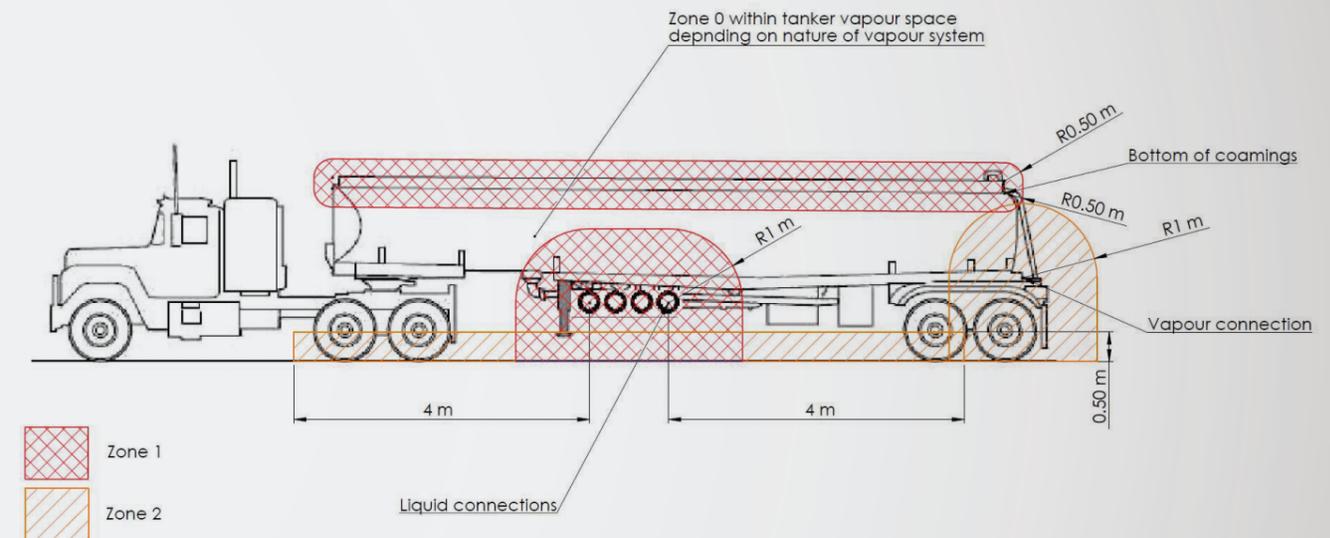


Technical requirements for Dangerous Goods trucks

Trucks that carry dangerous goods must operate under the conditions specified by the various State and Territory work-safety authorities. Unlike in the general truck domain, the Federal Government (Vehicle Standards Section within the Department of Infrastructure and Regional Development) and the National Heavy Vehicle Regulator (NHVR) do not regulate the technical standards applicable to the risks arising from the cartage of dangerous goods. The WorkSafe authorities issue approvals for individual vehicles and recognise approvals issued by each other. They co-operate via a consultative forum called the Competent Authorities Panel (CAP). The work-safety authorities have agreed that the technical standards for trucks and trailers that have a fixed tank used to transport dangerous liquids or gases are required to comply with the Australian Dangerous Goods Code (currently ADG 7.4). In turn this calls up relevant parts of Australian Standard (AS) 2809 Road tank vehicles for dangerous goods (Set). These are the 'design rules' for dangerous goods vehicles. There is one notable exception to this statement, which is that since June 2015 New South Wales requires heavy tank trailers (for flammable and corrosive liquids and gases) to have a functioning electronic roll-stability (ESC) system. NSW will extend this requirement to in-service tanker trailers from 2019. ESC is not a requirement of AS 2809. The

CAP has considered adopting the roll-stability requirement Australia-wide but the proposal continues to meet resistance. Fortunately for Australia, the NSW EPA is dragging the other regulations into the 21st century. ADG 7.4 is based closely on the model regulations that are developed by the United Nations Economic Commission for Europe (UN ECE). This organisation develops model rules for vehicle-related safety and environmental performance that nations can adopt. The Federal Government has the responsibility for border control and adoption of an internationally accepted DG framework is essential for efficient transportation of dangerous goods across national and state borders. The classification of flammability of dangerous goods is based upon the structure outlined in Australian Standard AS 1940. The storage and handling of flammable and combustible liquids, which is referenced in ADG 7.4. Dangerous goods can be classified into Classes 1 – 9. Flammable liquids and gases can be classified as Classes 1 – 3. The work-safety authorities apply technical requirements to trucks and trailers depending upon the class of the dangerous good. The detailed requirements are in AS 2809: AS 2809 Part 1: General requirements; Part 2: Flammable liquids; Part 3: Compressed liquefied gases; Part 4: Toxic and corrosive cargoes; Part 5: Bitumen-based products. Diesel fuel is classified as a Class C1

flammable liquid and no specific DG requirements, including roll-stability, apply to tankers that only carry diesel fuel. Risks around DG tankers are higher near to the outlets and this is accounted for by defining three risk zones: Zone 0 – Flammable vapours are continuously present; Zone 1 – Flammable vapours are likely to be present during operations; Zone 2 – Flammable vapours are unlikely to be present during operations but could be under adverse circumstances. The Zone boundaries can be calculated using the rules specified in Australian Standard 60079.10.1-2009 Explosive atmospheres, classification of areas – explosive gas atmospheres. The positions of the Zone boundaries are centred on the outlets and on the vent locations of the tank. The Diagram illustrates the Zones around a semi-trailer tanker during a discharging operation. For a prime mover the Zone 2 boundary is usually assumed to extend to the rear of the cabin so that any semi-trailer tanker can be pulled. The sources of ignition that could exist inside a Zone on a truck include a hot exhaust pipe, electrical arcing on wiring, very hot brake drums, alternator or starter-motor slip rings. Some of these risks do not apply when the vehicle is turned off or when the electrical system is isolated. However, there is no operational rule that requires the engine to be off or the electrical isolation switch to be open during cargo loading or discharge or that brakes are cold.



Road tanker discharge with or without vapour recovery - Based upon 60079.10.1

An explosive atmosphere could exist inside any Zone. Therefore, sources of ignition for any flammable liquid or gas must be controlled, with the required protections differing depending on the risk. For example, an engine exhaust cannot be located in Zone 0 or 1. An exhaust can be positioned in Zone 2 but it must be shielded so that splashed liquid cannot contact a hot surface. The shielding is required wherever the exhaust extends behind the rear of the cabin and a splash shield will be needed at the base of the cabin. The engine compartment is not usually inside a Zone and so exhaust shielding is not needed in the engine compartment or underneath the cabin. AS 2809 calls up conduit standards for

electrical wiring placed behind the rear of the cabin. It also allows protection "by an alternative means having equivalent effectiveness". My interpretation is that the essential requirements are that the wiring is: completely enclosed in a tough covering that provides abrasion protection, restrained so that it cannot flop about, resistant to the cargo being carried and completely sealed against fluid ingress. Surprisingly, the covering need not have flame retardant properties, which is a failing. Many wiring suppliers now provide 'modular' electrical cabling systems and plug-in lamps for DG tankers. These should be acceptable if the essential requirements are met. Australian Standard 2809 is slated for

review, which ARTSA intends to contribute to. Some requirements that are in the European standards for DG tankers (called Accord Dangereux Routier or the 'European ADR') should be added into AS 2809 as an acceptable alternative standard. It is time to de-mystify the differences between the Australian and European standards with the intention of allowing European prime movers and rigid trucks that have 'European ADR' status to be acceptable with minimal additions or modifications. Adopting the 'European ADR' requirement that DG trucks must have a powerful endurance brake is also needed here.

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