



NSW DEPARTMENT OF
PRIMARY INDUSTRIES

Electrical Engineering Safety

Decision Sheet 4.1

Electrical Safeguards for Electrical and Non-electrical Hazards

Water Cooling of Explosion Protected Enclosures

***A basis for consistent application of Electrical Engineering Safety
issues across NSW***

Decision Sheets are developed by the Inspectors of Electrical Engineering in response to issues raised or questions asked by others in the DPI, in particular Mine Safety Operations and from our external clients. They are for use by any staff in Mine Safety Operations, but primarily by Electrical Engineering staff. They can be distributed externally to the DPI.

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Electrical Engineering Safety Decision Sheet 4.1

Electrical Safeguards for Electrical and Non-electrical Hazards - Water Cooling of Explosion Protected Enclosures

Preamble

Electrical safeguards are often termed interlocks or trip systems. They are used as a risk control to protect workers when other risk controls have failed. It is important that these safeguards have a high degree of reliability. The higher the risk, the higher the reliability needs to be. This reliability is known in contemporary terminology as Safety Integrity and the higher the Safety Integrity Level, the more reliable the safeguard.

Issue

Some explosion protected enclosures, often of flameproof construction have water jackets (switchgear and motors). These water jackets are intended to maintain the temperature of electrical equipment at a level that prevents premature failure. Sometimes, the water jackets are essential in maintaining the surface temperature of enclosures to a safe level.

Position

Where water cooling is used on explosion protected equipment, the risk of failure of the water cooling must be assessed. Where it is necessary to remove power to the enclosure in the event of a failure of the water cooling system, then the circuits used to monitor the temperature of the enclosure and/or the water flow and the circuits used to remove the power must be automatic and have an appropriate safety integrity level.

