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Reading Between the Lines: Interpreting and Meeting the Intent of Australian Standards

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ABSTRACT

Emerging energy technologies are increasingly developed by international vendors and introduced into Australian industrial environments with limited familiarity with the local regulatory framework. While Australian Standards establish clear safety objectives, they are often interpreted by technology proponents as strictly prescriptive requirements rather than risk-based frameworks intended to demonstrate that risks have been reduced so far as is reasonably practicable (SFAIRP).

This paper presents a case study involving residual electrical energy hazards associated with a novel technology used in the production of a liquid hydrogen carrier. The stored electrical energy posed both a personnel safety risk and a potential ignition source, creating challenges in meeting the requirements of the AS/NZS 60079 Series for hazardous and explosive areas. Rather than treating the requirement as an absolute constraint, the project team undertook a structured process to interpret the intent of the standard, identify the underlying hazard being controlled, and demonstrate that the risk had been reduced SFAIRP.

Process safety tools were applied to develop a defensible safety case. Controls implemented included an automatic discharge circuit, physical barriers preventing routine contact with live components, controlled access provisions, and operational procedures governing maintenance activities. Collectively, these measures addressed the residual energy hazard despite the prescriptive requirement not being met directly.Ultimately, this demonstration of mitigating risks SFAIRP was used to demonstrate the installion met the underlying intent of the standard.

A key challenge was communicating this risk-based approach to international technology vendors unfamiliar with the Australian regulatory framework, including Safety in Design obligations under the Work Health and Safety Act 2011. Misalignment between prescriptive interpretations of standards and their underlying risk-based philosophy frequently creates unnecessary design conflicts and project delays.

This paper explores how process safety methodologies—including hazard identification, layers of protection analysis, and safety-in-design principles—can be used to demonstrate compliance with the intent of Australian Standards where strict prescriptive compliance cannot be achieved. The approach provides a practical framework for engineers introducing novel technologies into regulated environments while maintaining a robust and defensible safety case.

KEY WORDS

Process safety; Safety in Design; Risk-based compliance; Standards interpretation; Hazardous areas; Emerging technologies; SFAIRP

BIOGRAPHY

Thomas is a process engineer and risk consultant at GPA Engineering specialising in hydrogen technologies, process safety, and safety-in-design. He has supported the development and risk assessment of several hydrogen production and refuelling facilities across Australia, as well as compliance and safety assessments for emerging technologies including electrolysers, fuel cells, and liquid hydrogen carrier systems. Thomas contributes to standards development through the Standards Australia ME-093 Committee for hydrogen technologies, where he is involved in shaping guidance for the safe deployment of emerging hydrogen infrastructure.

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