



Chemeca2026
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28 – 30 September 2026
Melbourne, Australia



*Chemeca 2026 and Hazards Australasia
28 – 30 September, Melbourne, Australia*

Abstract title

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ABSTRACT

Like a ripple in a pond, the consequential effects of the renewable energy transition are being felt in different parts of the industry. Chief among those are the implications for a safety regulatory framework that has developed over time based on a relatively consistent hydrocarbon-fuelled energy market. The proliferation of solar, wind, battery and hydrogen (and derivatives) technology in particular is generating edge cases for the safety regulator to manage. WorkSafe Victoria is taking proactive steps to provide the industry with relevant regulation within the existing framework, outlined in its new Renewable Energies Regulatory Strategy 2025–2030, developed by Arup.

In Victoria, this transition is occurring at pace. The decommissioning of coal-fired generation and the rollout of renewable assets are changing the scale, geography and lifecycle of projects. Electricity demand is expected to increase significantly, alongside a rapid expansion in renewable generation. The regulatory focus is therefore shifting from a small number of large, centralised facilities to a broader portfolio of distributed assets, often located in regional or remote areas.

This transition is reshaping the underlying risk profile. Traditional high-consequence, low-likelihood events are being complemented by more frequent, lower-consequence risks, particularly during construction and commissioning. These phases now represent a larger proportion of the project lifecycle and are often characterised by a transient and relatively inexperienced workforce. This creates new challenges for regulatory oversight, inspection and engagement.

Many of the hazards themselves are not new, but are emerging in unfamiliar contexts. Technologies such as lithium-ion batteries and ammonia introduce known risks into new applications, requiring regulators to interpret existing legislation in new ways. This can lead to the application of adjacent regulatory mechanisms, highlighting both the flexibility and limitations of the current framework.

The Strategy also reflects the growing importance of subject matter expertise within regulatory bodies. Much of this capability has developed organically and is increasingly mission-critical. Formalising, sharing and enhancing this expertise, alongside improving data collection and analytics, is central to the regulatory response. Coordination across multiple regulators and government agencies is also essential, given the interconnected nature of the transition.

Finally, downstream impacts are emerging. The decommissioning of both fossil fuel and early renewable assets is creating new waste and recycling challenges, particularly for solar panels and batteries, introducing additional safety considerations.

Together, these dynamics reinforce the need for a proactive, adaptive and collaborative regulatory

approach to maintain worker health and safety outcomes throughout the energy transition.

KEY WORDS

New technology, risk assessment, regulators

BIOGRAPHY

Nigel has been active in the Australian Process Safety community since the Longford explosion, when as the manager of a PVC plant he led the development of the first major hazard facility safety case in Australia. During the early days, Nigel shared lessons learned with the major hazards community and regulators around the country.

Nigel has since been consulting with Arup on all areas of process safety and dangerous goods management including acting as an expert witness.

Nigel is also Arup's Global Chemical Engineering Skills Network leader and undertakes a number of IChemE and RPEQ volunteer roles.

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