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**Cognitive engineering for the control room:
Progress and challenges in human-system integration**

Professor Penelope M Sanderson
ARC Key Centre for Human Factors
The University of Queensland
St Lucia, Qld

The physical ergonomics of control rooms are reasonably well understood but the cognitive ergonomics are far more challenging. There are no assured formulae for designing control rooms that will support effective individual and team cognition, despite the existence of international standards and interface design guidelines. As electricity market structures evolve and as blackouts continue to occur, human-system integration questions require effective cognitive engineering. For example, how can we best help human controllers maintain situation awareness? What level of intelligent decision support is safe? What is an acceptable level of workload? How do we ensure controllers don't miss important signals? To address these questions I draw on examples of the work of my research group in generation, transmission and distribution, as well as further examples from aviation and healthcare.