

## Plenary Talk By **Dr. Prue Howard & Dr. Rob Jarman**

### Applying a Sociotechnical Lens to achieve Professional Practice Outcomes

#### ABSTRACT

The 2025 National Competency Standard for Engineering (NCSE) marks a significant evolution in Engineers Australia's threshold standards for Entry-to-Practice (EtP) engineers, building upon the foundations of the 2012 Stage 1 Competencies and formally aligning with the International Engineering Alliance (IEA) Graduate Attributes and Professional Competencies (GAPC) 2021 revision. The GAPC revision itself reflects contemporary needs, emphasizing values such as sustainable development, diversity, inclusion, and ethics.

The NCSE 2025 strengthens the standard for the Australian context by explicitly applying a sociotechnical lens across all ten competency domains, not merely within the dedicated "Sociotechnical Integration" domain. This approach leverages the newly introduced six Engineering Mindsets (e.g., Human-centred and Inclusive and culturally responsive) to make visible the tacit approaches essential for practice, viewing engineering as a socially embedded, ethically grounded, and human-centered profession. Key enhancements include embedding Indigenous cultural awareness (EtP-CM1, EtP-CO1, EtP-ST3), requiring consideration of social sciences within foundational technical knowledge (EtP-TK1), and mandating the systematic integration of social, cultural, environmental, and human factors into synthesis and design (EtP-SD1). This comprehensive integration ensures that EtP graduates are equipped not only with technical competence but also with the necessary judgement to manage the wide-ranging and conflicting non-technical issues inherent in complex engineering problems.



**Dr. Prue Howard**

Accreditation Visit Manager  
Engineers Australia

*Dr. Prue Howard is currently a Visit Manager for the Engineers Australia Accreditation Centre, responsible for running the accreditation process for the accreditation of individual education providers in Australia. She is also a member of the working group who have conducted the review of the Engineers Australia Competency Standards and written the new National Competency Standard for Engineering.*

*Previously she was an academic for thirty years teaching into engineering and accident forensics programs. My passion as an academic was integrating the human into the design process, with research centring around safe design and human centred design.*

*She had the privilege of researching, designing and implementing the first project based curriculum in engineering in Australia, which was combined with co-operative education, and steering that program through the Australian accreditation process.*

*Prior to her academic career, she worked as a design engineer in the materials handling industry and the pneumatics industry.*



**Dr. Rob Jarman**

Head of Credentials Development  
Engineers Australia

*Dr. Rob Jarman is a Fellow of Engineers Australia (FIEAust) and a Chartered Professional Engineer (CPEng EngExec NER), holding a PhD in Renewable Energy from the University of Technology, Sydney (UTS). He is currently the Credentials Project Lead in the Office of the Chief Engineer at Engineers Australia, responsible for developing the National Competency Standard for Engineers NCSE (2025).*

*Dr. Jarman spent an extensive period at UTS (1989 to date), where he served as an Associate Professor and Associate Dean Teaching and Learning. In this leadership capacity, he drove significant educational reforms, including the creation of the School of Professional Practice and Leadership and implementing initiatives that saw female enrollments in the Faculty of Engineering and IT increase from 16% to over 27%. His work also involved transitioning all scheduled subjects to remote delivery during the 2020 COVID-19 period. Furthermore, he acted as the Technical Lead for APACE-VFEG (1992–2015), a volunteer role where he designed and commissioned micro-hydroelectric systems for over 1000 people in rural overseas communities, including the Solomon Islands and Papua New Guinea.*