

Australian Digital Substation Challenges & Evolutions

Endeavour Energy Initial Digital Substation in 2010:

- **Characteristics**
 - Station Bus & limited use of process bus for control & intertripping
 - Maintain existing work practices
 - One off substation
 - Design and configurations developed externally
 - Not so much familiarisation and training for company personnel
- **Challenges**
 - Field staff unfamiliar and uncomfortable with operation
 - Unfamiliar Orphan IEDS
 - Increased risk of maloperation/mistakes
 - Minimal savings for project and operational costs
 - Firmware upgrade was difficult

Endeavour Energy Latest Digital Substation in 2019:

- Station bus and Process bus with use of MU and SV
- Standards developed for use at other sites
- Internal company personnel from different teams greatly involved design, configuration, installation, testing and commissioning
- Virtual test facilities and space savings
- Specified to save whole of life costs

TransGrid Challenges to Digital Substation Technology :

- Present external design resources are limited to implementing the TransGrid standard technology for EPC projects.
- Limited resources are available for maintenance, presently a lot of dependence on design staff
- 2 key benefits are reduction in cabling/ trenches and quick turnaround for bay augmentations. These benefits are applicable for large sub stations.
- Less benefit for indoor switchgear and smaller sub stations, TransGrid has designed 33 kV switchgears for renewable connections and distributors with duplicate relays with integrated control on board
- Digital technology implementation requires high level of standardization. Any new equipment or change to standard equipment requires redevelopment