

## **Australian Experience of the Benefits of Digital Substations and Measuring Benefits**

### **TransGrid Digital Substations with Process Bus and Station Bus using conventional CTs and VTs:**

#### **Grid Projects Implemented:**

1. AVON Switching station- 3 nos 330 kV bays (Brownfield)
2. Stockdill Substation- 330/132 kV sub station (Greenfield)
  - Stage 1 - 3 nos 330 kV bays, 330/132/11 kV transformer with 11 kV/415V Aux transformer and 132 kV connected feeder bay
  - Stage 2 – Addition of 132 kV bus, 132 kV feeder bays
3. 3. Molong 132/66 kV substation

#### **TransGrid Benefits Realisation :**

- Asset Management benefits:
  - Reduced assets with less panels
  - Less drawings with greater use of Fibre LAN
  - Operation and maintenance improvements with more monitoring and fault records - easier to configure
- Cost effective
  - Saving in with fibre and less copper cabling
  - Less trenching requirement/costs,
  - Smaller building so less building costs
- Time and Resource Efficient
  - Reduction in construction effort and time
  - Faster and efficient overall augmentation with work in parallel and less testing
  - Study Case **Stockdill augmentation** (next slide)

#### **TransGrid Study Case – Stockdill augmentation**

- Reduction in construction and commissioning effort and time
- Outdoor works related to secondary systems were limited to:
  - installation of outdoor boxes with MU and connections to primary plant.
  - Fiber duct laid to nearest fiber pit with spare ducts to control building
  - Fiber cable laid from MUs to FO Marshalling panel
- IEDs plugged into control panel
- Network configurations done @ lab and implemented live line @ sub

#### **Endeavour Energy Goals & Outcomes for 2019 Digital Substation**

- **Goals:**
  - Reduction in the cost of greenfield substation construction
  - Reduction in the whole of life maintenance cost of substations

- Improved construction efficiency
- Improved reliability
- Agile approach to react to changing network loads and connections efficiently
- **Outcomes:**
  - Modular buildings provided savings of \$5.5M
  - A reduction in copper cabling and installation provided savings \$0.4M
  - A reduction in protection and control panels provided savings of \$0.25M
  - Modular Buildings provided 9 months time savings compared to traditional civil and building construction