

Presented by Peter Bishop - Convener

Brisbane – 21/11/2019



cigre

For power system expertise

B5

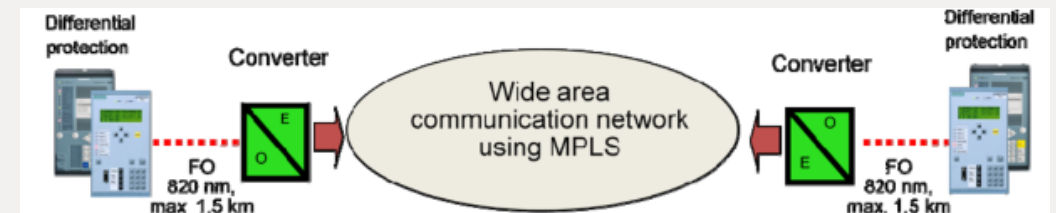
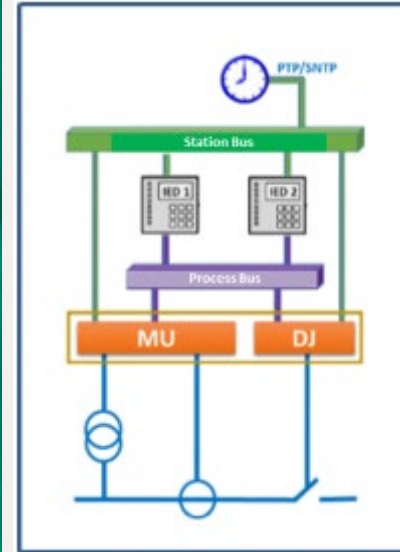
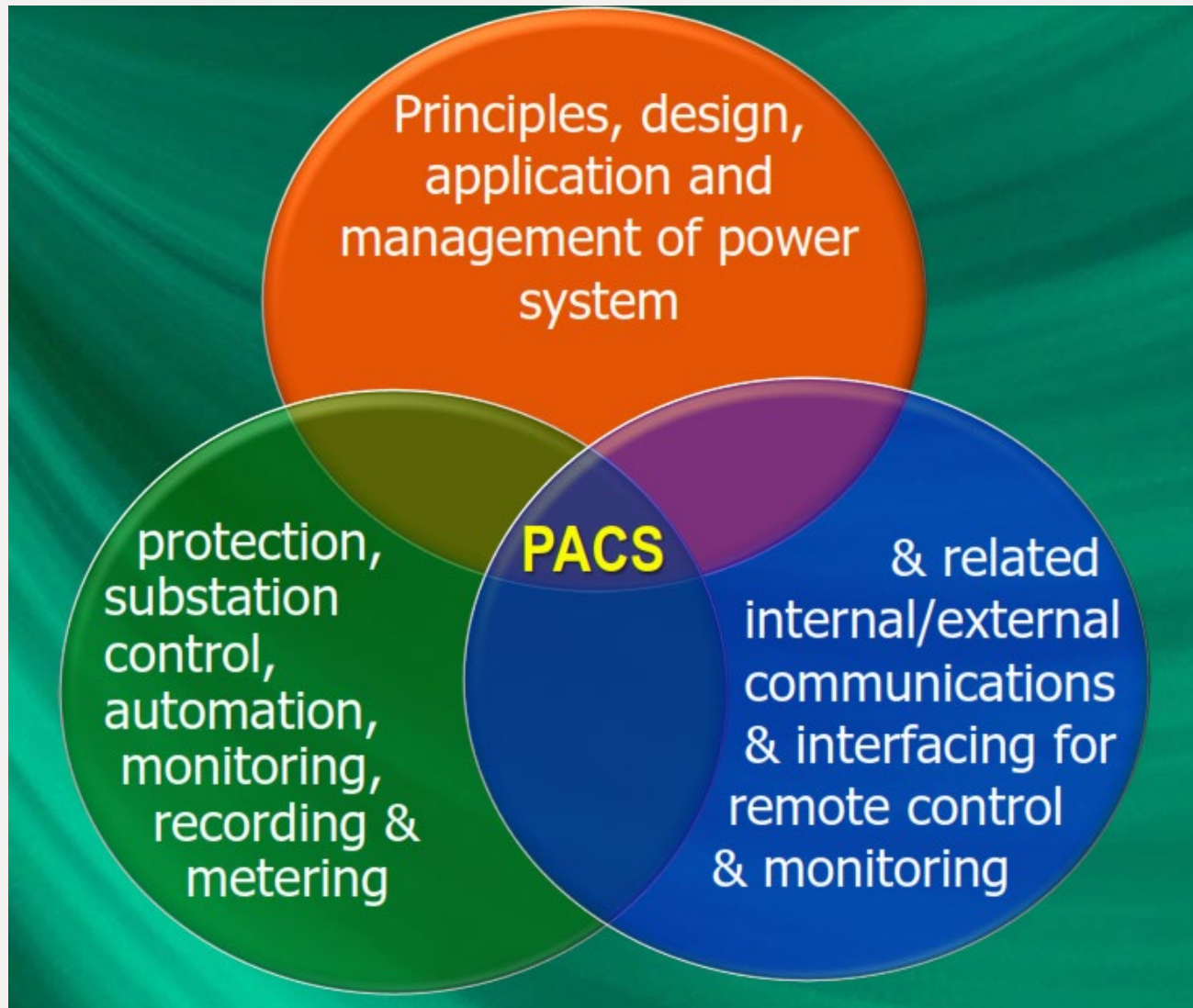
Protection and
automation

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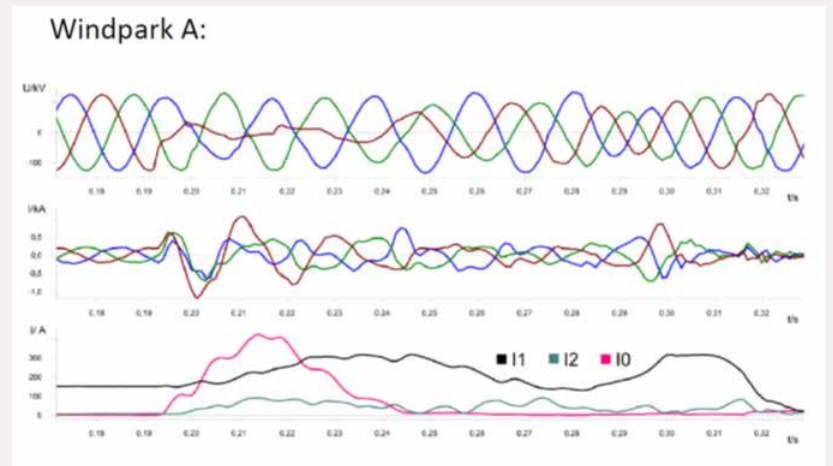
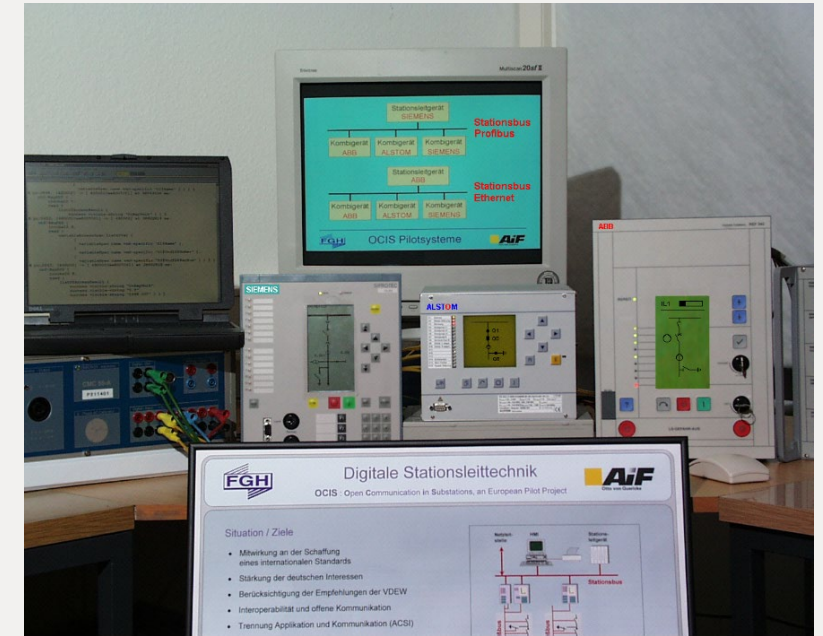


Scope of Study Committee B5 – Protection & Automation



Key B5 Future Focus Areas

- Greater inclusion of distribution protection and end to end system co-ordination
- Future Preferential Subjects and Working Groups on:
 - Interoperability for devices of different manufacturers (new applications & technology)
 - Fast transient based protection (renewables)
 - Managing the Protection Impact of Low-Inertia and Low Fault Level Networks (renewables)
 - Protection communication requirements for inter-substation and wide area applications
 - Modelling of protection systems for power system planning



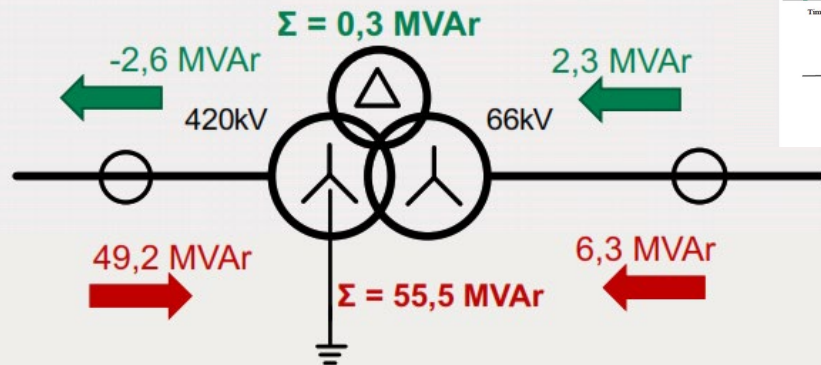
Study Committee B5 2019 Norway Meeting – Solar Storm Tutorial

- Geomagnetic Storms Tutorial - Impact on Power Systems
- Many counties affected – including Norway and NZ
- Large dc currents can flow
- 2018 Norway transformer saturation and protection trip
- Due for very large storm – bigger & wider area impact
- Recommend study vulnerability – model, measure & mitigate



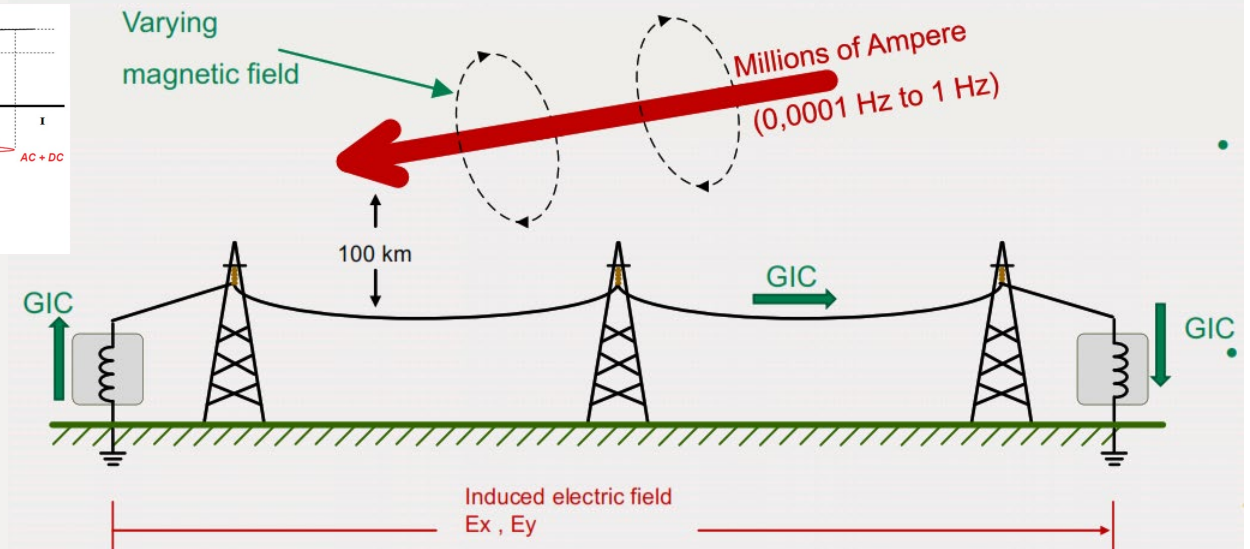
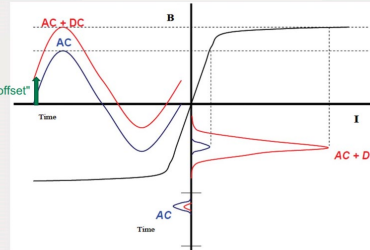
Example:

Reactive power flow during normal operation



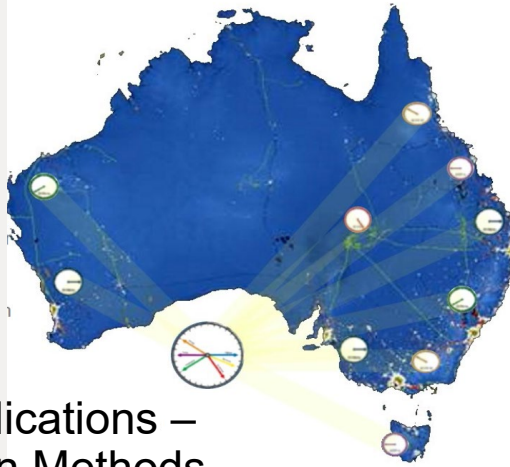
Example:

Observed reactive power during sun storm



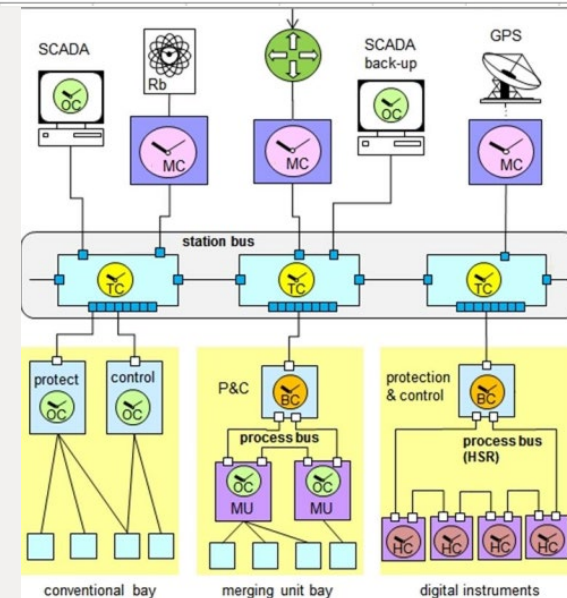
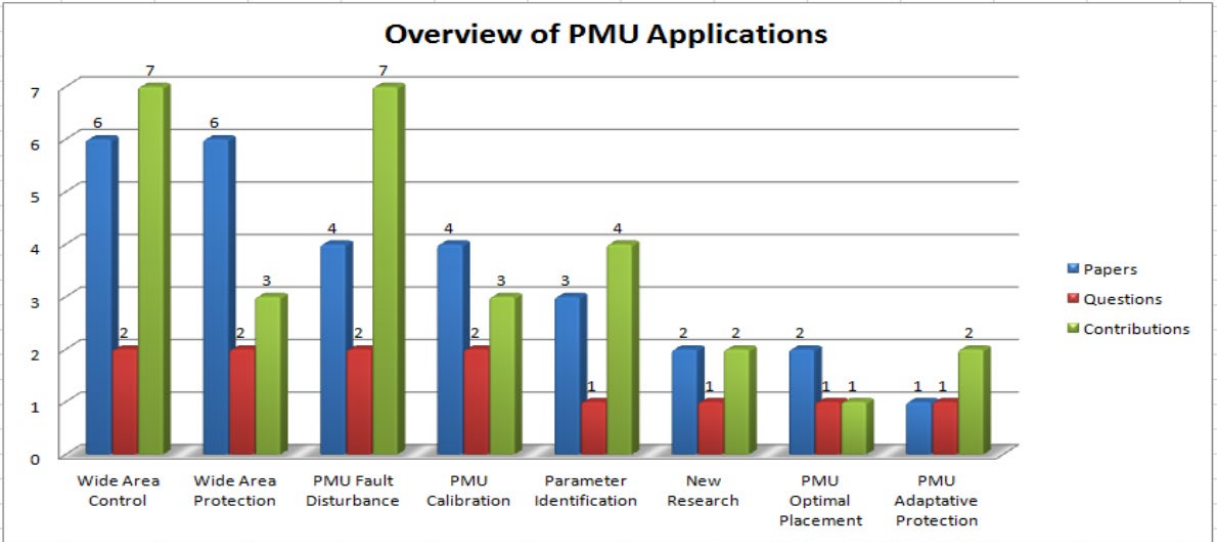
Study Committee B5 2019 Norway Meeting – Preferential Subject Aspects

- PS1: Leveraging Phasor Measurement data for better Protection, Automation and Control Systems
 - Range of applications maturing
 - Including for Distributed Energy Resources



- PS2: Time in Protection Applications – Time sources and distribution Methods
 - Time is now critical for protection and digital subs
 - Alternative Sources
 - LAN connected

- PS3: Future technologies for inter-substation communication and Migrating Digital Teleprotection Channels to Packet-Based Networks



Australia/NZ Activities - SEAPAC Conference in Sydney – 19 & 20 March 2019

- 139 Delegates
- 12 Exhibitors
- 35 Presentations
- Diverse Range of Topics
- Keynote speech from TransGrid on changing Grid and challenges ahead



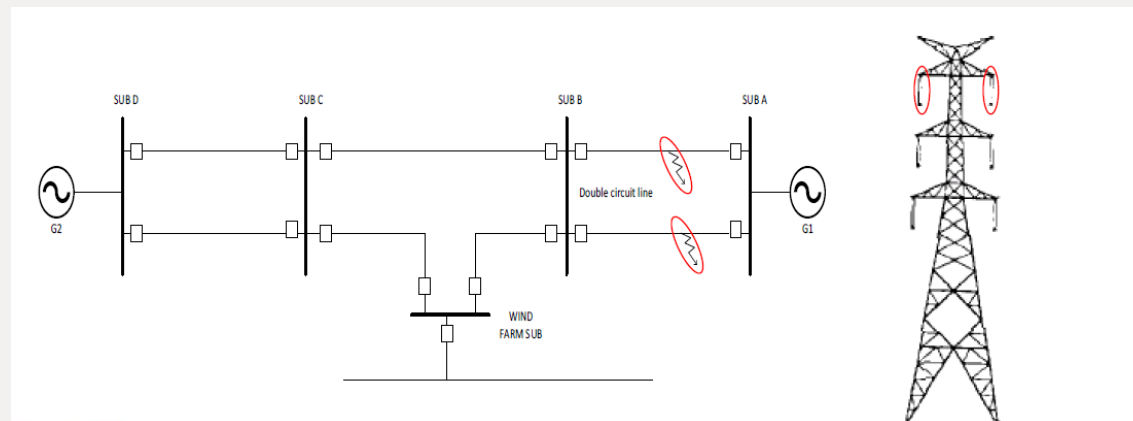
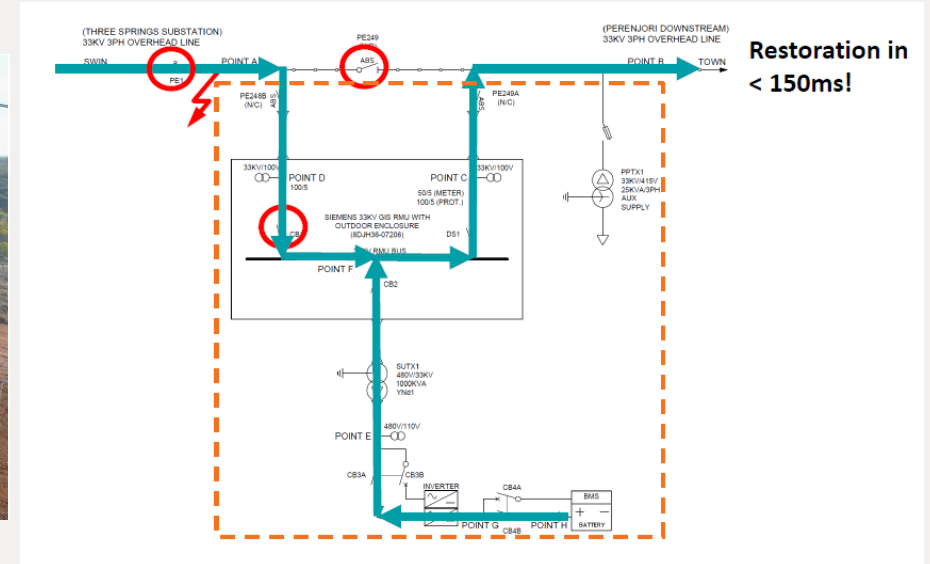
ATC Seminar 2019



SEAPAC = South East Asia Protection &
Automation Conference

Australia/NZ Activities - SEAPAC Conference in Sydney – Presentation Highlights

- **BESS Battery experience**
– Improve remote towns supply reliability with battery during faults
- **Frequency change - affect on Protection**
- **Renewables Protection - Islanding Experience**
- Using Wavelength Division Multiplexing for **High Speed Protection Signal Scheme Applications**
- Using **SCADA for automated reactive power control**
- Large Scale Australian **PMU Application Project**

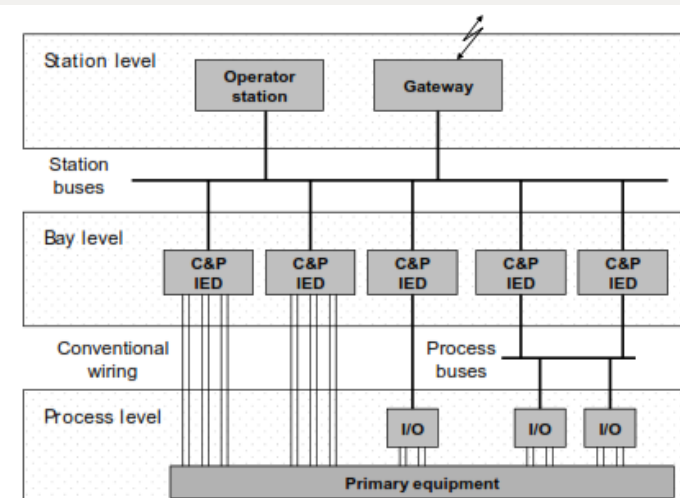
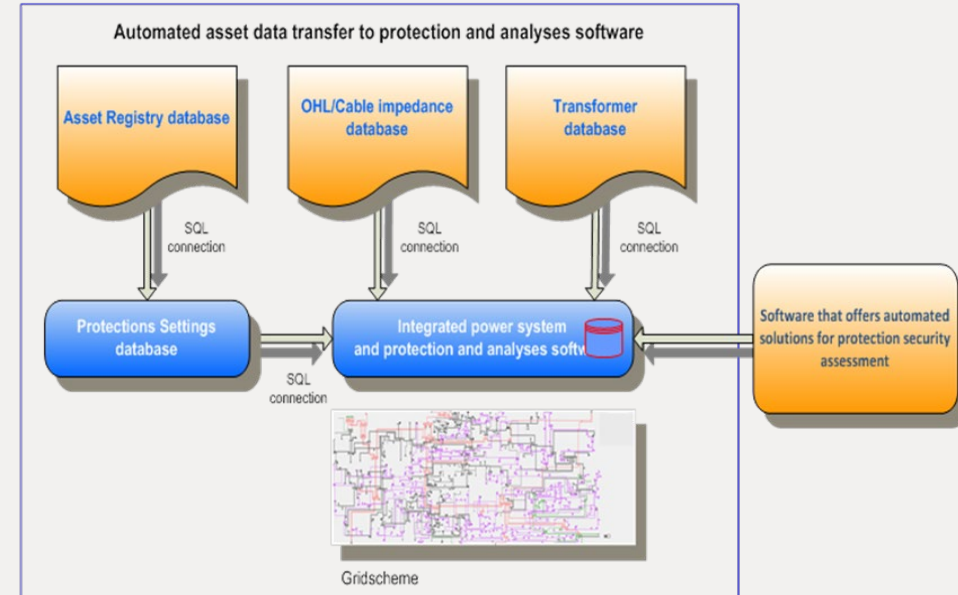


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Australia/NZ Activities - Working Group & Task Force Involvement

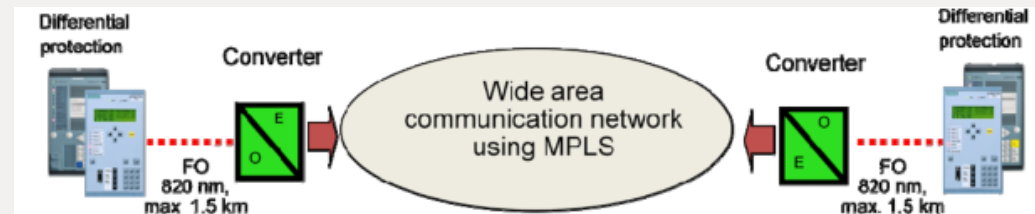
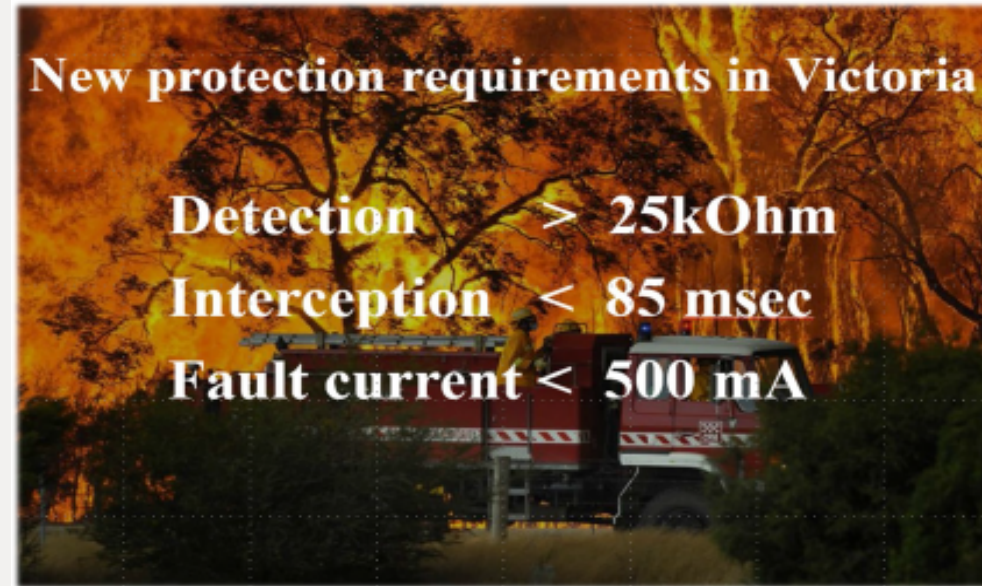
- Australian B5 panel representatives **contribute to 14 Working Groups** and **one Green Book Task Force**
- Working Groups include:
 - B5.47 - **Network Protection Performance Audits**
 - B5.57 - **New challenges for frequency protection**
 - B5.58 - **Faster protection and network automation systems**
- Australia B5 panel convenor is also SC B5 **IEC61850 Green Book** Convenor
 - Very relevant for future digital substations
 - Standard for communication between devices for schemes etc
 - Compact Study to cover principles and practice for wide audience
 - To include Primary System Applications

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Australia/NZ Activities - Panel Meeting and Website Panel Interactions

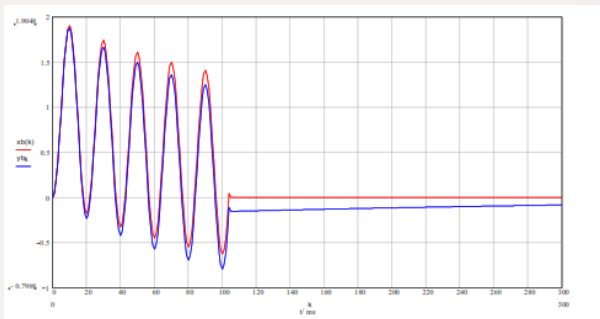
- Snowy Hydro hosted Panel Meeting
- Local Presentations on Protection Issues and website interaction
 - Alternative protection approaches to prevent bushfire from power system fault
 - Protection testing before migration to packet based communication network
- Seven Australian/NZ Contributions developed for Norway SC B5 Meeting



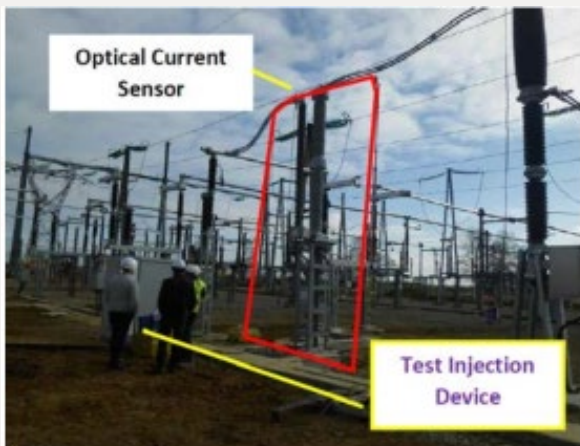
2019 Deliverables

Technical Brochures

- WG B5.24 – TB 768 - **Protection Requirements on Transient Response of Digital Acquisition Chain**



- WG B5.53 – TB 760 - **Test Strategy for Protection, Automation and Control (PAC) Functions in a full digital substation based on IEC 61850 Applications**



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