

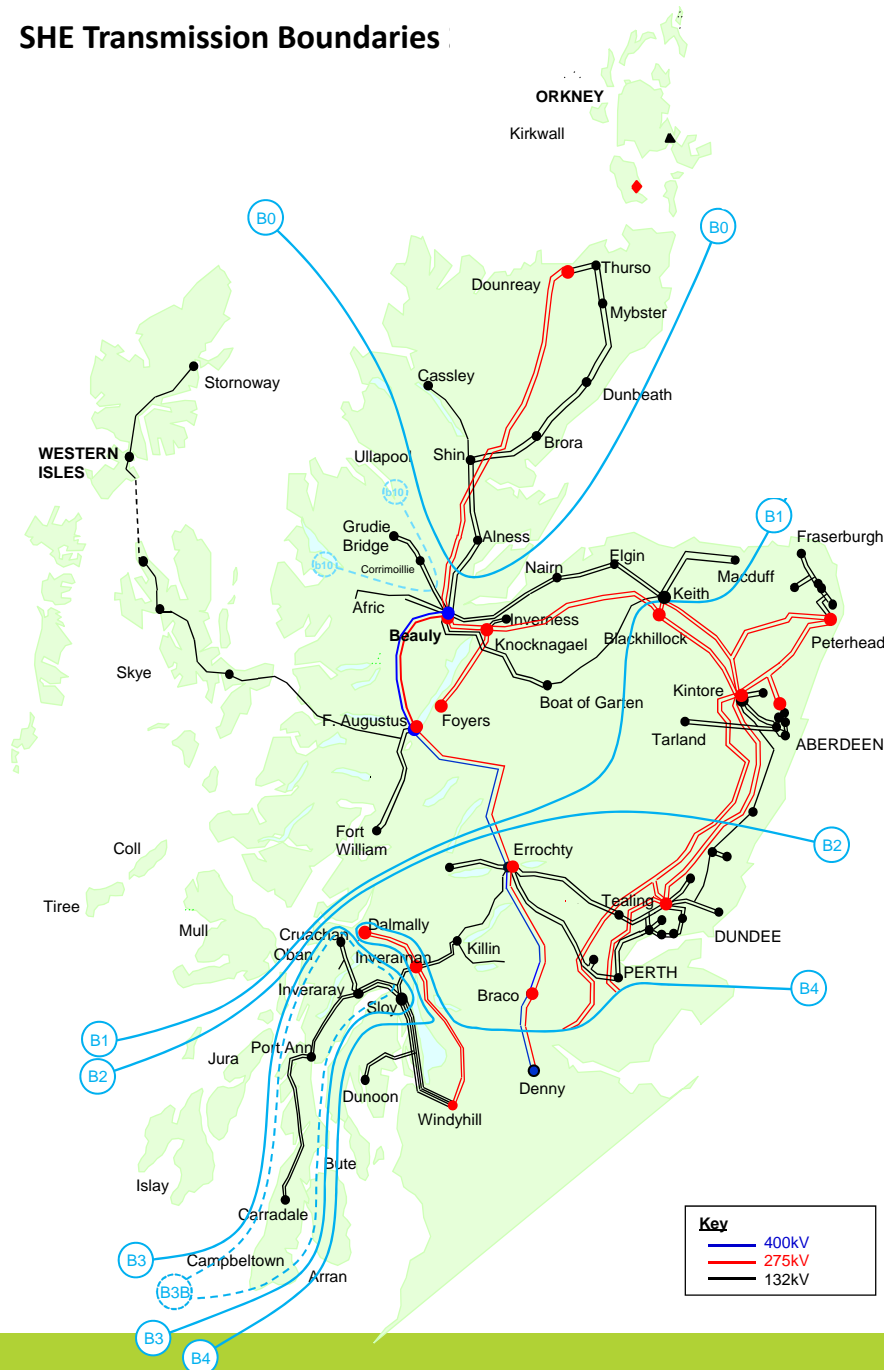
# SHE Transmission Planning

## Errochty 132kV System Intertrip

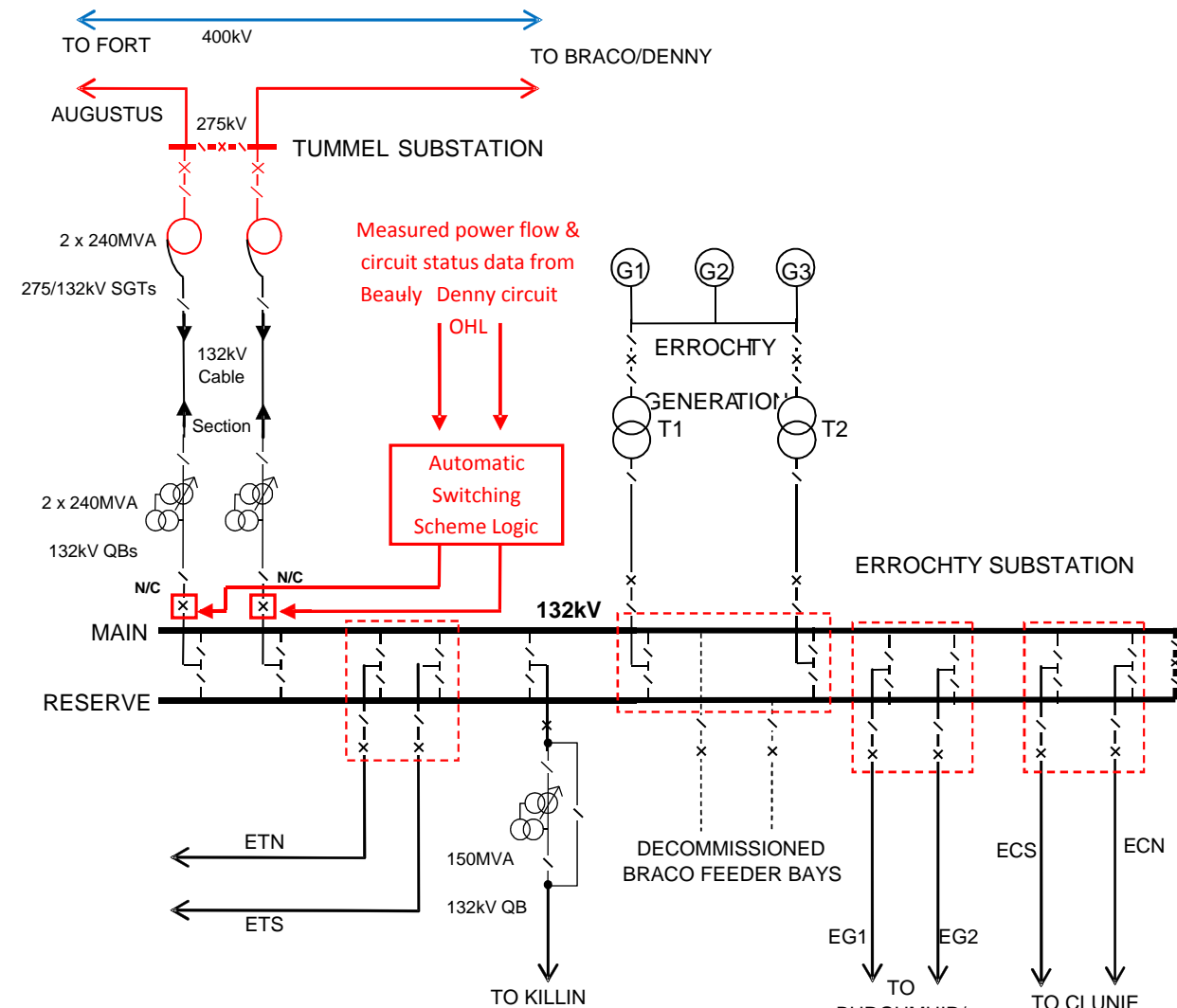
17<sup>th</sup> July 2015



## SHE Transmission Boundaries



- Transmission network 2015.
- Characterised by strong east coast 275kV network.
- Completion of Beauly-Denny this year.
- 132kV parallel systems still an important part of the interconnected system.
- 132kV system at Errochty remains connected to B-D to harvest generation and provide security.
- Phase shifters installed at Errochty between 132kV and B-D to control power flows into 132kV system.



N/C: Normally Closed

# System Need for Errochty Intertrip

- Ongoing driver for B2/B4 reinforcement beyond B-D
- Network constrained on east coast
- East coast reinforcement limited on B4 by parallel 132kV system around Errochty which has limited capacity.
- Proposed Errochty intertrip stops flows into 132kV system for critical B-D fault.
- Effective means of providing additional capacity on B4 by splitting the 132kV system away from B-D for fault.
- Therefore Errochty intertrip is a component part of SWW project for East Coast reinforcement.





# Generation Impact

- Disposition of generation is important.
- Individual generators north of Errochty limited impact on 132kV flows on ccts leaving Errochty, participation factors 1-2%.
- Cumulatively however, phase shifters can only hold back so much and 132kV parallels eventually become an issue – hence part of East Coast SWW.
- However, generation connected directly to the 132kV network are critical to flows on 132kV ccts.
- Significant increase in generation recently on the 132kV network to south and east of Errochty.



# Issue

- Tullymurdoch connecting to Coupar Angus, directly on the 132kV network.
- Advancing to 2016 connection date, requires local intertrip until Coupar Angus GSP transformers uprated.
- Analysis indicates impact of adding Tullymurdoch leads to 132kV overloads for a fault on B-D.
- Errochty intertrip could help but timing is the issue
  - Full SWW East Coast reinforcement was scheduled for 2018 but CBA analysis indicates later.

# Potential Solutions

- Solutions could include:
  - a) 132kV reinforcement, expensive and long lead time
  - b) ANM solution – system to generator, potentially complex, low cost relative to (a) but much higher cost than (c), not deliverable within timescales
  - c) Errochty intertrip, design started as part of SWW project, less complex than (b), less expensive than (b), deliverable (just) within timescales
- Errochty intertrip or ANM on their own do not increase boundary capacity but could be used operationally to allow generation access.

# Commercial Implications

- If Errochty intertrip advanced to allow Tullymurdoch access, SHET have no mechanism to recover costs
  - if advanced ahead of East Coast works no longer part of SWW
  - no boundary capacity created therefore not volume driver
- Tullymurdoch direct beneficiary of works
- Proposal was for Tullymurdoch to fund until such time that SHET could recover costs as part of wider SWW reinforcement. Then Tullymurdoch could be re-funded.