ESCRI-SA
Path to Registration and Islanding Update - ElectraNet

ESCRI Knowledge Sharing Reference Group

14 August 2018

In partnership with:

agl

ARENA
Australian Government
Australian Renewable Energy Agency

Advisian
WorleyParsons Group

This activity received funding from ARENA as part of ARENA's Advancing Renewables Programme

ESCRI - Dalrymple North BESS

Presentation outline

- Final Path to Registration
- Islanding Testing Update

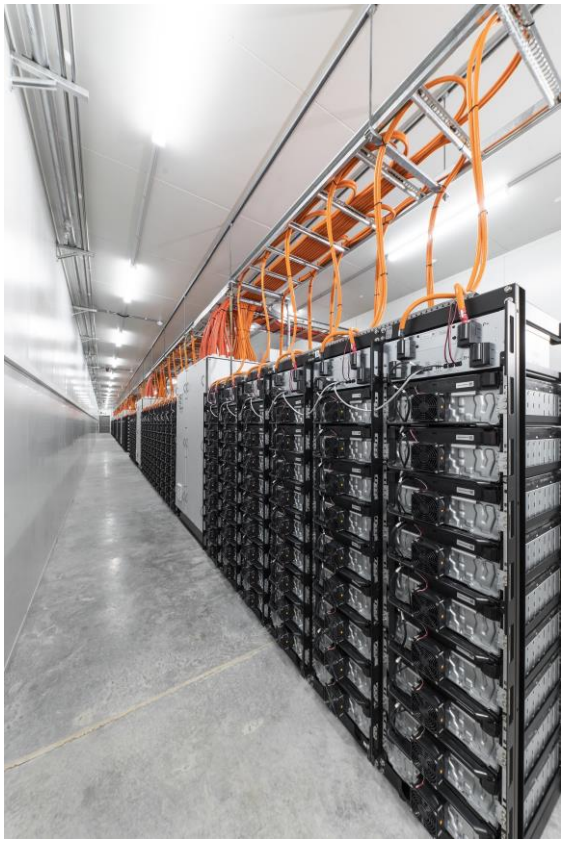
Wattle Point Wind Farm

Final Path to Registration

- Steps required to achieve BESS registration and approval
  - ✓ Completed connection application received by ElectraNet and AEMO from AGL, including Generator Performance Standards (GPS) and ESCOSA assessment
  - ✓ Completed due diligence of GPS by ElectraNet and AEMO
  - ✓ Updated EMMS and NEMDE constraints to include battery system
  - ✓ Confirmed due diligence of GPS by AEMO to AGL (5.3.4A letter)
  - ✓ AGL's ESCOSA Generator licensing application
  - ✓ AGL sign off of metering application
  - ✓ Submission of Commissioning Test Plan to AEMO
  - ✓ Completion of SCADA and telemetry works including AGL, AEMO and ElectraNet control rooms
  - ✓ ESCOSA Board approved BESS generation licence on 16 May 2018
  - ✓ AEMO Registration Committee approved BESS registration on 5 June 2018

Final Path to Registration Lessons Learnt

- Timeframes
- Clear accountabilities
- Resourcing
- Update to AEMO SCADA system

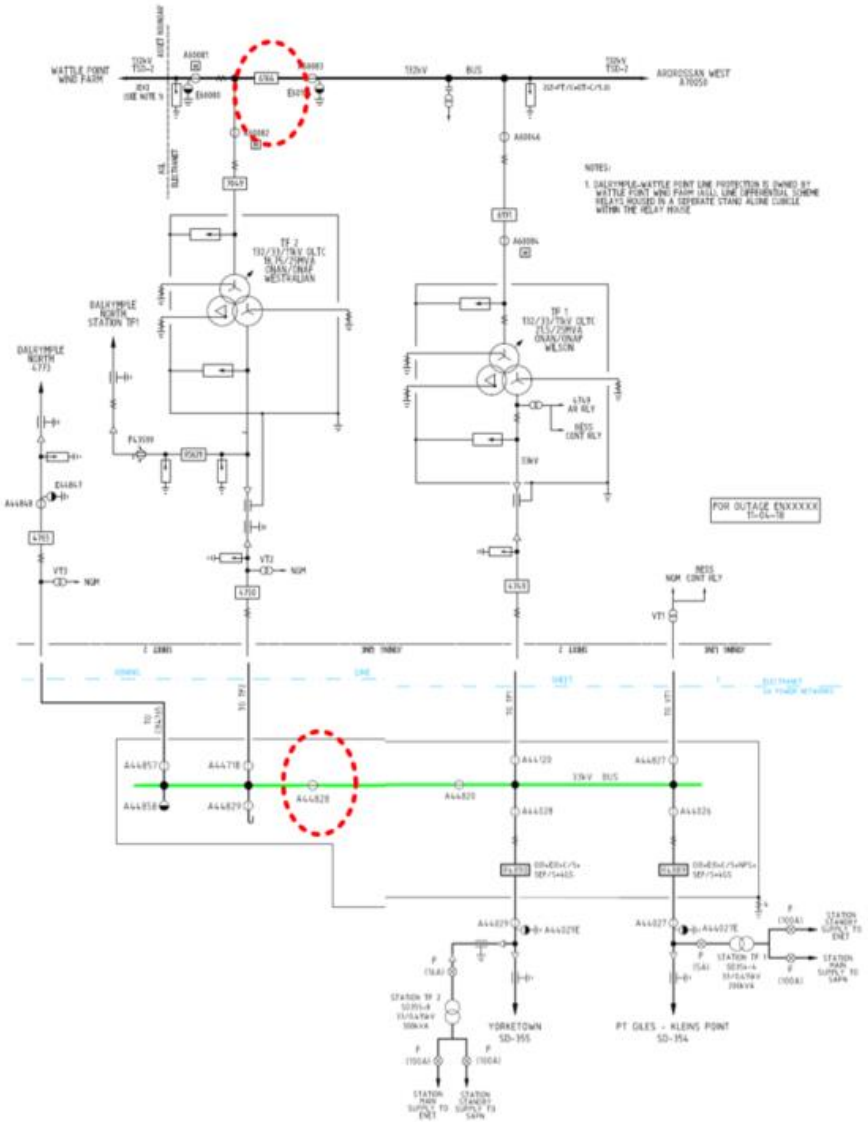


Islanding Testing

- Islanding testing of the BESS and Wattle Point Wind farm was conducted on 10 July 2018
- Test conducted by ABB and CPP with AGL and ElectraNet in attendance
- Test involved disconnecting from the grid, leaving the BESS and the line to Wattle Point wind Farm in an island
  **Note: the local distribution load was excluded from this test*

Islanding Testing

- All wind turbines were stopped from the BESS system.
- 1 BESS module(PCS1B) with a total capacity of 3.117 MVA was running grid-connected with 0 MW/0 Mvar output
- System load was 0.4 MW/ -0.5 Mvar at WPWF, DALRN station load ~ 0.3 MW.
- CB6166 was opened by ElectraNet TSO



Islanding Testing

- Test conducted with a single BESS module in service
- Upon islanding, voltage and current distortion occurred, the BESS current rating was exceed and the system tripped due to under-frequency
- Testing was stopped and an investigation commenced

Islanding Analysis

- Detailed simulations using PSCAD by Electranix have been conducted using the same parameters as those used in the island test
- These simulations have been successful in replicating the test results
- Results of the simulation have concluded that:
  - A single BESS module in service in the island was not sufficient to reduce voltage rise caused by the capacitive charging in the island
  - Careful attention should be paid to the amount of reactive power sources in an island prior to operating the BESS in an island
  - In full island mode a minimum of 10 BESS modules in-service is required to meet fault current requirements

Islanding Next Steps

- Revision of test plans currently underway by ABB
- This will be followed by detailed simulation in PSCAD (Electranix and ENet) to verify safe operation
- Islanding testing is rescheduled to occur in September 2018
- Testing will occur in a staged manner with the local distribution load only in the first instance, followed with Wattle Point Wind Farm only and then combined testing
- Any required changes resulting from this testing will flow into the R2 testing and model validation

Questions

ElectraNet

ElectraNet Pty Limited
PO Box 7096, Hutt Street Post Office
Adelaide, South Australia 5000

P +61 8 8404 7966 or 1800 243 853 (Toll Free)
F +61 8 8404 7956 **W** electranet.com.au

ABN 41 094 482 416 **ACN** 094 482 416

Thank you

Laurie Antal

ElectraNet
52-55 East Terrace
Adelaide SA 5000
Ph. +61884047697
Email: antal.laurence@electranet.com.au

In partnership with:

agl

ARENA
Australian Government
Australian Renewable Energy Agency

Advisian
WorleyParsons Group

This activity received funding from ARENA as part of ARENA's Advancing Renewables Programme