

Powerline Bushfire Steering Committee

December 2017

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Agenda

- ▶ **REFCL**
 - ▶ **Grimes Review Implications**
 - ▶ **Woori Yallock Current Status**
 - 2nd GFN being commissioned
 - ▶ **REFCL installation activities overview**
 - Barnawartha
 - Rubicon A
 - ▶ **Program Status**
 - ▶ **Program Update & Schedule**
 - ▶ **HV customer dashboard**
- ▶ **Other bushfire mitigation programs**
 - ▶ **ACR Program**
 - ▶ **Powerline Replacement**

Grimes Review Implications

► AusNet Services Response to Recommendation 27

- › Will assist the Minister in reviewing the REFCL program
- › REFCL program is an application of technology still in development with inherent risks
- › Tranches overlap in execution hence no clear time for review between tranches
- › Any savings from review may be offset by costs of de-mobilising and re-mobilising
- › Any review will necessitate stopping of the clock with respect to prescribed dates in the Bushfire Mitigation Civil Penalties Scheme

► Potential Impacts of a review

- › AST plan to submit CPA2 in March 2018 - The AER unlikely to approve cost recovery where there is possibility a review may recommend a halt or material modification to the program
- › Delicate HV customer negotiations around upgrades to their installations that must be undertaken in order to allow the REFCLs to be operated. If a customer is going to pay for upgrades they must be assured a REFCL will actually be installed at their zone substation

► Potential Opportunities from a review

- › Optimise scope e.g. removing cable only feeders from REFCL coverage may reduce number of REFCL's at multi-REFCL sites.

Review of Victoria's Electricity and Gas Network Safety Framework

Interim Report



October 2017

Woori Yallock Current Status

▶ Woori Yallock 2nd GFN

- › The commissioning of a second REFCL at WYK is well progressed is expected to complete in December 2017
 - › Note: Line balancing works are not scheduled to be completed until mid-2018 therefore the REFCLs will not be operating at the mandated sensitivity levels initially
 - › Pending signature of one HV Customer
- › Should the technical issue encountered by Powercor at Woodend in relation to the operation of 2 GFN's arise at Woori Yallock, the fall back position is for both Arc Suppression Coils to be fed by one inverter, resulting in reduced sensitivity.



Key Point: Targeting WYK to be in service prior to Christmas but not at required capacity

Barnawartha



► REFCL Commissioning Progress

Functional testing of the GFN complete ready for next commissioning stage

- › Over a period of 4 days between the 8-11 November 2017
- › GFN was commissioned in a reduced network configuration (about 50%) at BWA.

	Typical BWA Configuration	Commissioning BWA configuration
Overhead (kms)	283	136
Cable (kms)	11	8
Network size (A)	59	41

► HV Customers

- › 2 major customers – Uncle Toby's (4MW) and Woolworths (2MW)
- › Both run 24/7 manufacturing and storage plants
- › Negotiations to secure outages took 3 months
- › Outcomes involved:
 1. Extensive feeder switching
 2. Use of diesel generators during the commissioning period to support HV customers.



Barnawartha

► Stress Testing

- › Stress testing was carried out successfully
- › No weakened assets were found on the reduced BWA network (result of more extensive investigations and testing than at WYK). In part due to increased cable testing (partial discharge) and repair of failed joints/cables as required
- › Result - customers did not experience any unplanned outages

► Primary Earth Fault Testing

- › Overall GFN performed well with some minor issues to be investigated
- › GFN inverter ramping settings had to be optimised
- › 400 Ω and 12,800 Ω faults were successfully detected and located on the reduced BWA network

► Next Steps

- › Finalise test locations
- › Balancing works to be completed (one cap bank & phase transpositions)
- › HV customer solutions to be implemented (critical path)
- › Compliance tests



Key Point: HV customers and balancing work to be completed before compliance tests can be carried out and REFCL placed in service due by October 2018

Rubicon A



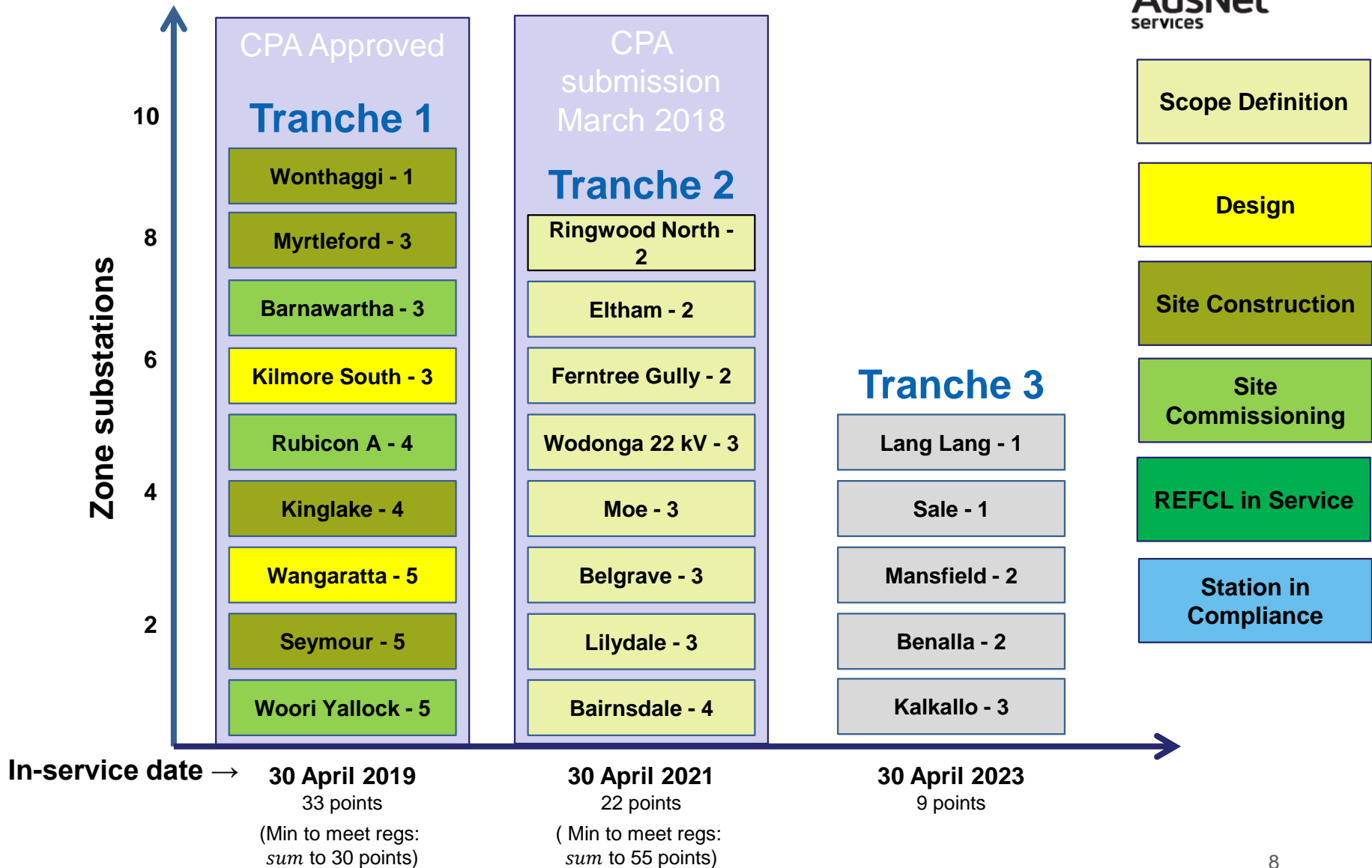
- ▶ **All construction work at Rubicon A (RUBA) complete**
- ▶ **REFCL ready for pre-commissioning**
- ▶ **Pre-commissioning work to be completed by end December 2017**

- ▶ **Decision made to defer stress testing until after the 2017/18 summer**
 - › Commissioning postponed until May 2018
 - › Allows line balancing to be completed ahead of commissioning
 - › In service date to be confirmed pending implementation of HV customer solutions

- ▶ **Benefits**
 - › Reduced risk of cancellation due to high fire risk
 - › Reduced risk of cancellation due to delays at WYK
 - › Maintain good relationship with HV Customers
 - › Complete line balancing prior to commissioning

Key Point: HV customers works to be completed before compliance tests can be carried out and REFCL placed in service

Program Status



Program Update & Schedule



- ▶ Tranche 2 Contingent Project Application preparation underway
- ▶ Tranche 1 implementation including network hardening, network balancing, compatible equipment, design and station construction works ongoing
- ▶ Proactive engagement with Tranche 1 & 2 HV customers, Tranche 1 HV customer solutions progressing
- ▶ Isolating transformer tender process complete

Zone Substation	Activity / # of GFN'a	Q1 '17	Q2 '17	Q3 '17	Q4 '17	Q1 '18	Q2 '18	Q3 '18	Q4 '18	Q1 '19	Q2 '19	Q3 '19	HV customer connections
Wonthaggi	1		Design	Design	Construction	Construction	Construction	Construction	Construction	Compliance testing			2
Myrtleford*	1		Design	Design	Design	Construction	Construction	Construction	Compliance testing				0
Barnawatha	1	Design	Construction	Construction	Construction				Compliance testing				2
Kilmore South	1		Design	Design	Design	Construction	Construction	Compliance testing					1
Rubicon A	1	Design	Construction	Construction	Construction			Compliance testing					3
Kinglake*	1		Design	Design	Construction	Construction	Construction	Compliance testing					0
Wangaratta	2			Design	Design	Construction	Construction	Construction		Compliance testing			2
Seymour*	2			Design	Design	Construction	Construction	Construction		Compliance testing			2
Woori Yallock	2		Design	Construction	Construction			Compliance testing					1

Tranche 1 compliance date

* Associated rebuild activities not included

** Compliance testing is subject to the HV customer solution being in place & completion of line balancing works

Legend: Design Construction Compliance testing

Tranche 1 HV customer dashboard



ZSS	Feeder	Type of customer	# of connection points	Proposed solution	Negotiation status	HV customer compliant date	Comments
BWA	BWA23	Demand	1	Isolating transformer	Identified land for isolating transformer. Waiting for scope to negotiate footprint.	TBD	Site for isolating transformer identified, scope design in preparation.
BWA	BWA21	Demand	1	Isolating transformer	Council land in front of BWA ZSS identified as isolating transformer site	TBD	Available council land next to BWA ZSS. Awaiting scope design to begin lease/easement discussions.
RUBA	RUBA21 RUBA23	Generation	2	TBA	In discussion	TBD	Customer planning to harden, potential asset transfer to AusNet Services.
RUBA	RUBA24	Generation	1	Isolating transformer	Generation stability report provided to HV customer	TBD	Isolating transformer location and scope of work under development.
WYK	WYK23	Generation	1	Hardening	Amended Connection Agreement provided to HV customer	12/12/2017	Connection Agreement amendment form agreed and with customer for signature
WGI	WGI21	Generation	1	Isolating transformer	Isolating transformer to be located next to HV connection point	TBD	Scope design in preparation, space constraints due to heritage and wildlife issues.
SMR	SMR1	Demand	2	Isolating transformer	Awaiting land lease approval from Commonwealth	TBD	Extensive customer cable network necessitates isolating transformers. Property rights in discussion with commonwealth.
KMS	KMS01	Demand	1	LV conversion	Awaiting 3 quotes for LV works	TBD	LV conversion most economic solution due to reduced customer load.
WN	WN5	Generation	1	Isolating transformer	Generation stability report provided to HV customer	TBD	Isolating transformer location and scope of work under development.
WN	WN7	Demand	1	Isolating transformer	Identified land for isolating transformer. Waiting for scope to negotiate footprint.	TBD	Aging customer assets drives isolating transformer. Scope design in preparation and site identified.
Transfer feeder							
LLG	LLG13	Demand	1	TBA	In discussion	TBD	Load can be transferred from Lang Lang to Wonthaggi. Hardening and isolating transformer options are under discussion with the customer.

ACR Program



➤ Completed December 2015

Fire Consequence Level	# Devices Highest Risk Areas	# Devices Remaining Risk Areas
TFB/Code Red	165	900

Powerline Replacement

Powerline Replacement Fund

- 1,680km in 'codified' areas
- 86km replaced; cost = \$44M
- 76km in progress; cost \$31M
- Scheduled completion Jul 2019

AusNet Services' Program

- Conductor condition good
- Risk Based Modelling
 - Vegetation
 - Reliability
- No contingent projects identified
- Approx \$500-600M investment

