

Powerline Bushfire Safety Committee

December 2018

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Agenda



▶ REFCL

1. Tranche 1 compliance update
2. Technical issues update
3. Harmonics
4. Program status
5. REFCLs in service for the 2018/19 summer
6. Exemptions and Extensions of Time

▶ Other bushfire mitigation programs

7. ACR Program
8. Powerline Replacement

1. Tranche 1 compliance update



Zone Substation	Planned Compliance Date	Issues Currently Preventing Compliance (ignoring harmonics)
Woori Yallock	Early March 2019	CT Performance
Barnawartha	Compliance Tests Successful	None
Rubicon A	Early April 2019	CT Performance, AGL Hardening Works
Kilmore South	Late February 2019	CT Performance
Kinglake	Early March 2019	Site Works Completion
Myrtleford	Late January 2019	Anomalous network fault
Wangaratta	Early April	CT Performance
Seymour	Mid – February 2019	None
Wonthaggi	Late 2019	Cultural heritage issues associated with network and customer hardening works

Key messages:

- Schedule includes significant compliance testing over summer – weather dependent as no fault-throw testing on days with extreme or higher fire-risk
- All compliance testing at risk of failure due to harmonics

2. Technical issues update



▶ Sensitivity/Faulty Feeder Identification

- › Poor performance caused by combination of CT performance and inconsistent admittance calculations
- › At WYK result is poor sensitivity (5kΩ)
- › Compliance can be achieved at sites with better CT's and smaller networks
- › Replacement CT's sourced for sites where required

▶ Harmonics

- › Investigations ongoing – needs industry approach to find appropriate solution
- › Back to R&D and associated timeframe

GFN Technical Issues

▶ ASC Tuning

- › Some remaining issues especially on small networks

› Inconsistent admittance calculations

- Being worked on by Swedish Neutral but no solution in sight

› Inverter Tripping

- Swedish Neutral unable to resolve to date, AusNet engineers investigated REFU firmware directly and made changes – improved but not entirely resolved
- Understood to be related to phase angle when contactor closed

› Busbar Voltage Compensation

- SN fixed algorithm so function now working on all phases
- Performance still less than ideal

Key messages:

- Some progress on GFN technical issues however several issues remain
- Harmonics will prevent achievement of compliance at some sites

3. Harmonics at Tranche 1 ZSS Busbars



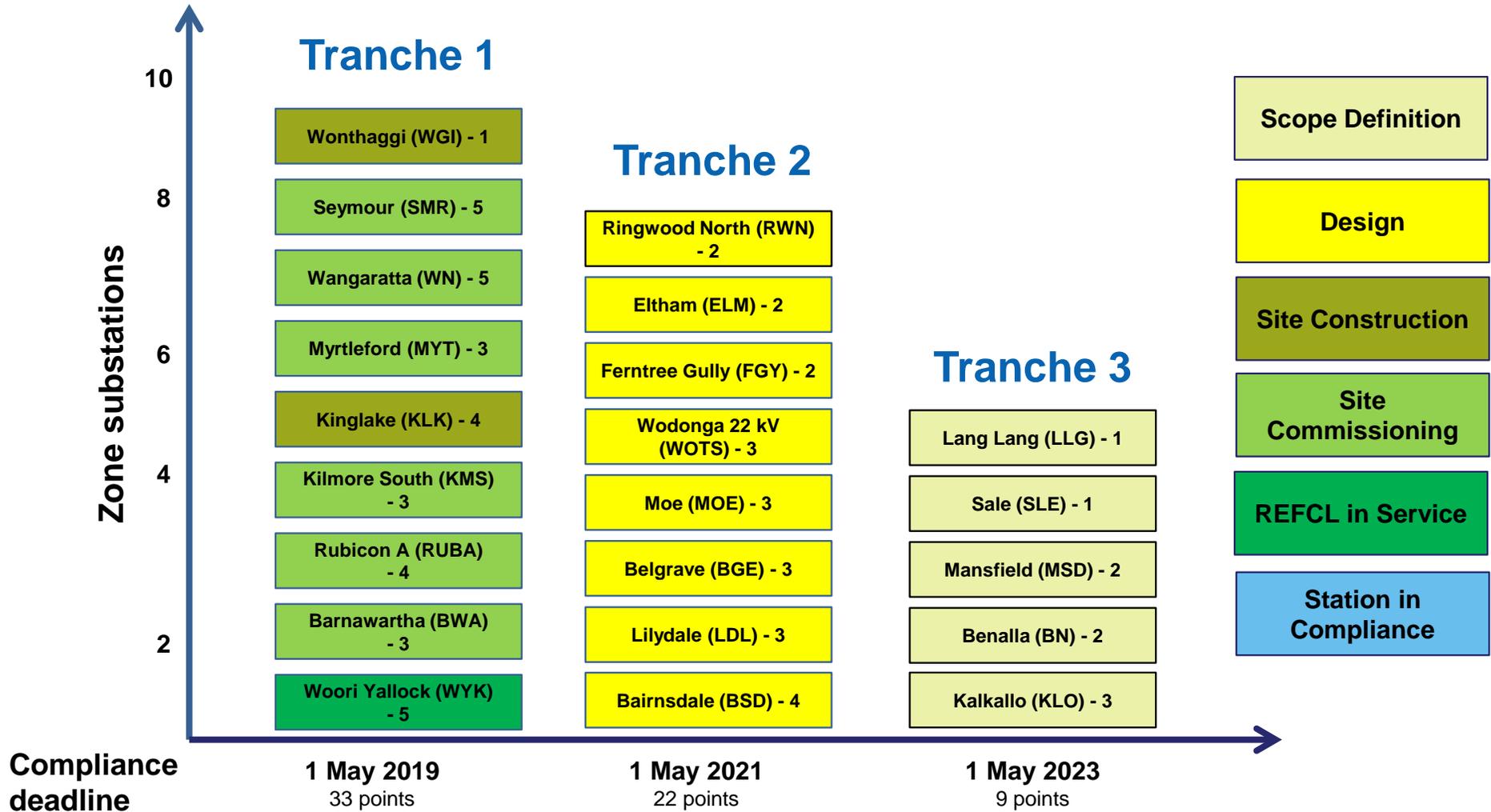
Zone Substation	Harmonic Levels*
Woori Yallock	Up to 3.27%
Barnawartha	Up to 2.35%
Rubicon A	Up to 1.97%
Kilmore South	Up to 2.1%
Kinglake	Up to 2.0%
Myrtleford	Up to 3.1%
Wangaratta	Up to 3.50%
Seymour	Up to 2.45%
Wonthaggi	Up to 2.85%

- › Stated Harmonics are maximum values recorded during 1 week in April 2018
- › Voltage collapse target in Bushfire Mitigation Regulations is 250V which equates to ~2% Total Harmonic Distortion
- › Levels vary significantly which makes meeting compliance very uncertain
- › Australian Standard has THD of 6.5% - maybe considered as part of the EDC review to be undertaken by the Essential Services Commission which would be challenging for REFCL operations.

Key message:

- Harmonics may prevent compliance being achieved at many sites

4. Program status

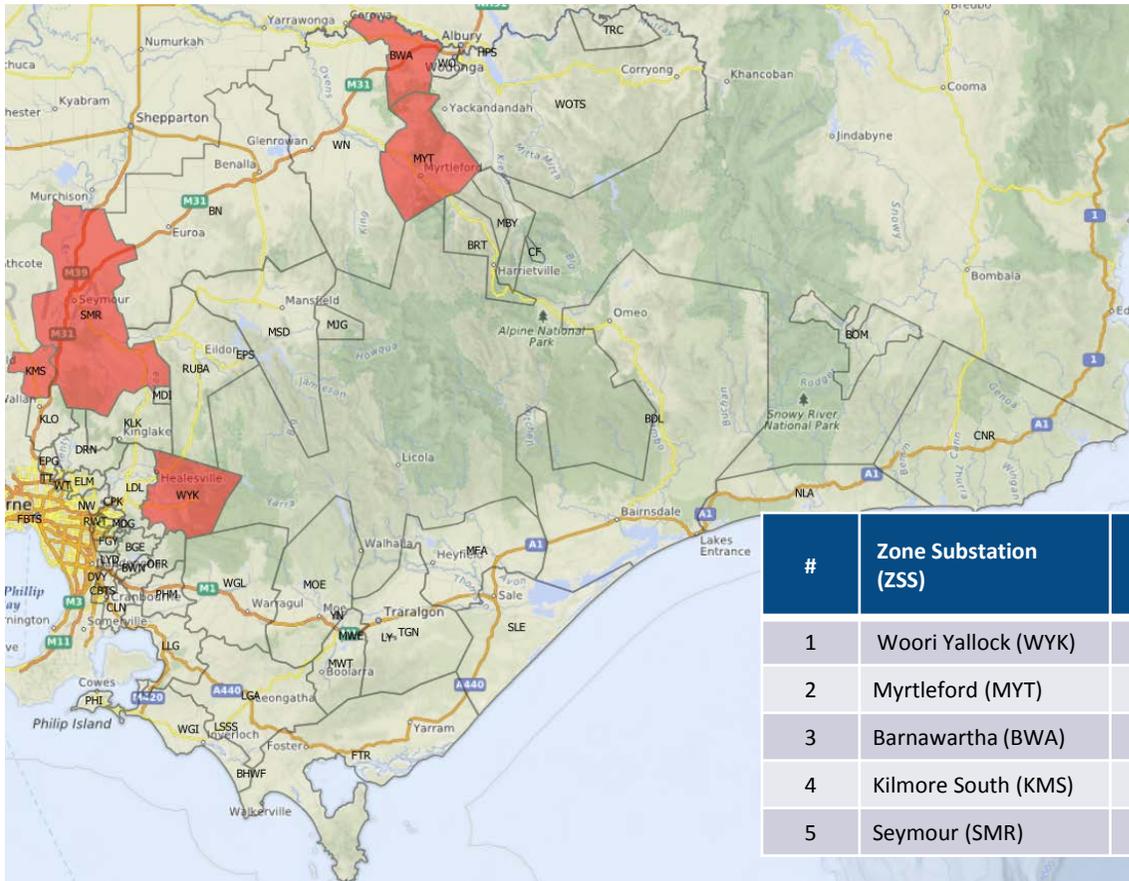


(Min to meet regulations: sum to 30 points)

Commercial in confidence

(Min to meet regulations: sum to 55 points)

5. REFCL's in Service by end December 2018



#	Zone Substation (ZSS)	# points	# of GFNs	# of feeders	# of HV connection points	In service date*	Sensitivity
1	Woori Yallock (WYK)	5	2	4	1	5 December 2018	2.5 amps
2	Myrtleford (MYT)	3	1	4	0	14 December 2018	<1 amps
3	Barnawartha (BWA)	3	1	4	2	14 December 2018	0.5 amps
4	Kilmore South (KMS)	3	1	2	1	19 December 2018	2.5 amps
5	Seymour (SMR)	5	2	6	2	20 December 2018	tbc

* Status as at 6 December 2018

Key messages: Planning to have REFCLs in service at five ZSSs by end of 2018 subject to:

- no unforeseen delays in the completion of HV customer solutions and/or testing activities
- favourable weather conditions

6. Exemptions and Extensions of Time



- ▶ **All applied for Tranche 1 scope exemptions have been approved by the Governor in Council and published in the government gazette**

- ▶ **No exemptions currently planned for Tranche 2**
 - › potential scope exemption at Bairnsdale will not be pursued in the short term

- ▶ **Draft time extension related to harmonics sent to ESV and initial feedback received 30 November 2018**
 - › discussions with ESV are in progress

7. ACR Program



➤ **Completed December 2015**

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

8. Powerline Replacement

Powerline Replacement Fund

- 1,680km in 'codified' areas
- 147km replaced; cost \$70.9M
- 29km in progress; cost \$13.7M
- Scheduled completion Nov 2019

AusNet Services' Program

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

