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26 August 2016

David Young
Director, Energy
Essential Services Commission
Level 37, 2 Lonsdale Street
Melbourne Victoria 3000

Dear David

Electricity Distribution Code Compliance and Rapid Earth Fault Current Limiters (REFCLs)

Over the next seven years AusNet Services and Powercor Australia Limited (**Powercor**) will install REFCLs on our networks to reduce bushfire risk. This is required by the *Electricity Safety (Bushfire Mitigation) Regulations 2013* (**Bushfire Mitigation Regulations**) which set statutory deadlines for REFCL installation at specific locations.

In undertaking the REFCL Program, our Businesses have identified that the testing and operation of REFCLs in the network may lead to breaches of clause 4.2.2 of the Electricity Distribution Code (**EDC**) which sets standards for voltage variation. For example:

- during REFCL testing, there is a requirement to apply increased 'Phase to Earth' voltage for a period in excess of the time period allowed in the EDC; and
- when a REFCL is in operation, the impacted network has the potential to experience voltage above the 'Phase to Earth' voltage limit allowed in the EDC.

Whilst we assist the Essential Services Commission (**ESC**) with a review of the EDC voltage variation thresholds, as part of the broader ESC review of the EDC, the technical testing of REFCLs needs to progress to enable the effective planning for, and management of, operational risks.

Following the successful completion of testing, it is intended to operate REFCLs at Gisborne (Powercor), Woodend (Powercor) and Woori Yallock (AusNet Services) over the 2016/17 summer period.

We request a no action letter from the ESC in relation to the potential non-compliance with clause 4.2.2 of the EDC until such time as the inconsistency between the Bushfire Mitigation Regulations and the EDC is resolved.

The particulars of this matter are discussed in more detail in **Attachment 1**.

If you have any questions regarding this matter, please contact Hannah Williams on (03) 9683 4088 and via email hwilliams@powercor.com.au, or Anh Mai on (03) 9695 6627 and anh.mai@ausnetservices.com.au.

Yours sincerely



David Matassoni
(Acting) GM Asset Management
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Hannah Williams
Manager Compliance & Projects
Powercor

ATTACHMENT 1

Background

On May 1 2016, the Victorian Government made the *Electricity Safety (Bushfire Mitigation) Regulations 2013* (**Bushfire Mitigation Regulations**) which require AusNet Services and Powercor to install Rapid Earth Fault Current Limiters (**REFCLs**) on specific parts of our networks to reduce bushfire risk.

REFCLs are a new technology which offers the potential to reduce network related fire risk. The type of REFCL which we are planning to install on our networks are called Ground Fault Neutralisers (**GFNs**). GFNs involve an arc suppression coil (**ASC**) working in combination with a residual current compensator (**RCC**) to reduce the fault current at the point of a fallen powerline to near zero.

The Regulations include a seven year implementation timeframe and performance standards that will be administered by Energy Safe Victoria (**ESV**). Implementation of REFCLs will be achieved in three tranches with delivery due by 2019, 2021 and 2023 respectively.

To meet the Victorian Government's deadlines, work to plan and scope the REFCL Program is currently being undertaken by our Businesses. Contingent project applications to obtain regulatory approval for the associated expenditure will be submitted to the AER in early 2017.

REFCL testing and operation and the Electricity Distribution Code

GFNs are a relatively new technology. As such, our Businesses are on a steep learning curve to build experience in operating our networks with GFNs and understand their impact. Testing GFNs at the early stages of the Program rollout is important to:

- Maximise learnings and reduce technical risk once the REFCLs are commissioned;
- Enable the development of quality network design and operational procedures;
- Inform project scoping and forecasting for our contingent project applications for REFCLs expenditure to the AER; and
- Enable the successful rollout of REFCLs to meet our statutory deadlines.

AusNet Services currently has one live REFCL project at Woori Yallock which is due for completion by October 2016.

Testing at Woori Yallock commenced in August 2016. At the times the GFN has been switched on for testing, duration for increased voltages at that location have exceeded the limit set out in clause 4.2.2 of the Electricity Distribution Code (**EDC**).¹

Similarly, Powercor will commence the testing of on its REFCL in Gisborne in early September 2016 and Woodend in October 2016 with potentially similar results.

Given we are obliged to comply with both the EDC and the Bushfire Mitigation Regulations, we have been working with technical experts and Energy Safe Victoria to develop potential amendments to the EDC which would be appropriate in the context of a network designed for GFNs.

¹ See Attachment 2 for highlighted problematic limits in s.4.2.2

Customer impacts

Customers connected to the low voltage network (including residential customers) are not impacted by the testing and operation of REFCLs. Accordingly, these customers will not be impacted by a no action decision by the ESC.

Further, although the testing and operation of REFCLs has the potential to impact high voltage (**HV**) customers, only one such customer (Melbourne Water) is connected at Woori Yallock. To minimise the impact on Melbourne Water, AusNet Services has negotiated appropriate times to disconnect the customer to enable testing. There are no HV customers connected to the Woodend and Gisborne zone substations.

ATTACHMENT 2: Relevant Limits in clause 4.2.2 of the Electricity Distribution Code

Table 1

STANDARD NOMINAL VOLTAGE VARIATIONS				
Voltage Level in kV	Voltage Range for Time Periods			Impulse Voltage
	Steady State	Less than 1 minute	Less than 10 seconds	
< 1.0	+10% - 6%	+14% - 10%	Phase to Earth +50%-100% Phase to Phase +20%-100%	6 kV peak
1-6.6	± 6 %	± 10%	Phase to Earth +80%-100%	60 kV peak
11	(± 10 %		Phase to Phase +20%-100%	95 kV peak
22	Rural Areas)			150 kV peak
66	± 10%	± 15%	Phase to Earth +50%-100% Phase to Phase +20%-100%	325 kV peak

Ph-E voltage: 12.7kV *1.8 = 22.86kV