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Attention Mr Steve Oh

Dear Sarah

Submission in Response to Draft Decision on the Review of Voltage Standards for Bushfire Mitigation

We are pleased to have the opportunity to make this submission for consideration by the Essential Services Commission (ESC or Commission) as part of its review of the voltage standards contained in the Electricity Distribution Code (EDC). It is provided in response to your Draft Decision released on 22 May 2018. This is an important review to facilitate the Victorian Government's requirements on Victorian distributors, including AusNet Services, to establish Rapid Earth Fault Current Limiters (REFCLs) on the networks in bushfire prone areas.

As described in the Draft Decision, the operation of the REFCL will cause the phase to earth voltage at 22kV customer connection points to rise above the existing limits in the EDC during the period the REFCL is responding to a phase to ground fault. Accordingly it is necessary to review the voltage standards to recognise the impact REFCL operation has to voltages on electricity distribution networks protected by a REFCL. Revised standards must ensure that electricity infrastructure at and beyond the customer connection point is compatible with a REFCL protected network.

AusNet Services supports the ESC's Draft Decision because it:

- Provides the appropriate flexibility to operate the 22kV network such that our obligations under the *Electricity Safety Act 1988*, the Electricity Distribution Code and the *Electricity Safety (Bushfire Mitigation) Regulations 2013* can be met;
- Sets clear accountabilities for compatibility with REFCL operation, for equipment at and beyond the point of connection on networks nominated in the *Electricity Safety (Bushfire Mitigation) Regulations 2013*;
- Provides clarification for the AER's revenue determination process in relation to Tranches 2 and 3 of the REFCL Program; and
- Provides a customer information process to support future plans to implement resonant earthing.

The Draft Decision provides much needed certainty and a solid basis for AusNet Services to progress the remainder of the REFCL Program to meet the regulated requirements.

We understand the Draft Decision may have a significant financial impact on some High Voltage (HV) customers. Accordingly, we note and support the Commission's observations regarding the potential for financial support for affected HV customers.

Importantly, our submission raises a number of areas where additional clarification is required. We would be pleased to discuss any queries arising from our submission and provide further information to support the Commission's review.

Sincerely,

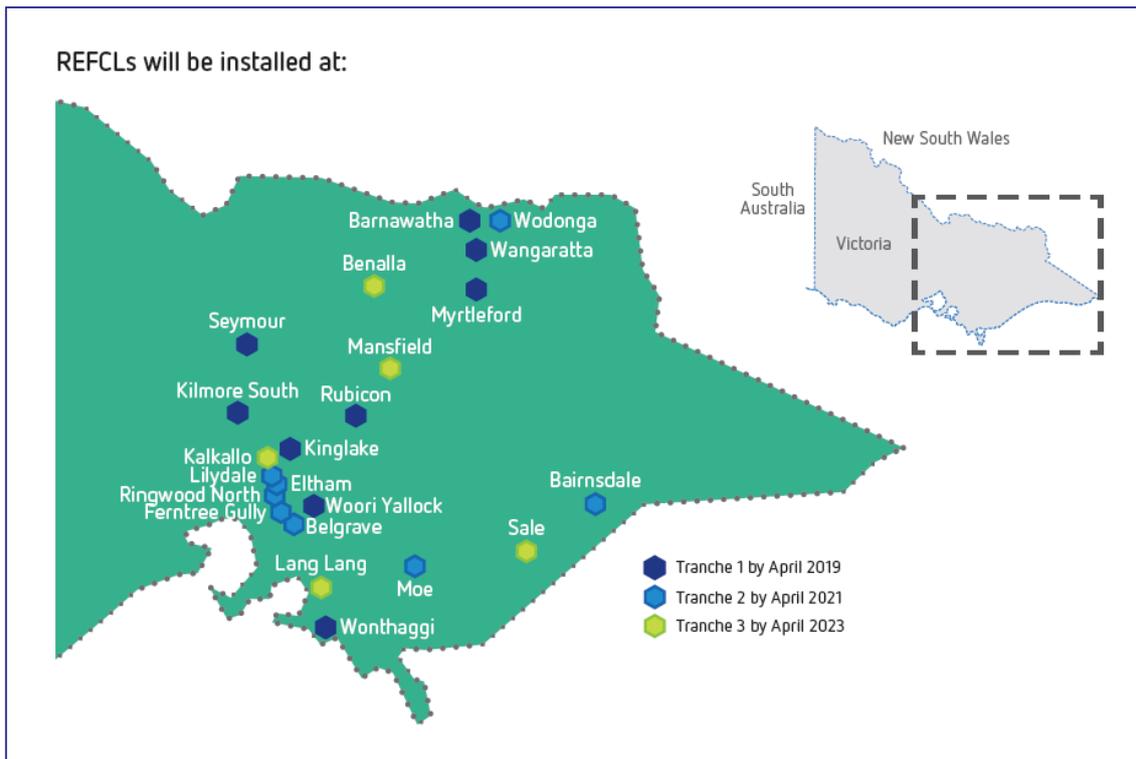


Kelvin Gebert
Manager Regulatory Frameworks

Submission in Response to Draft Decision Review of Voltage Standards for Bushfire Mitigation

1 Need for Alteration of Phase to Earth Voltage Standard

Rapid Earth Fault Current Limiters (REFCLs) are to be installed on 22kV network in fire prone areas. 45 zone substations across Victoria have been selected for the installation of REFCL. The 22 AusNet Services zone substations selected are identified in the following figure.



The existing Electricity Distribution Code (EDC) was designed, and is applicable, for solid or low impedance neutral earthing. REFCL technology is based on resonant earthing which is high impedance and allows the neutral voltage to vary significantly during phase to ground faults. This results in the healthy (un-faulted) phase to earth voltage breaching limits currently specified in the EDC (the voltage standard) when operating in response to a fault.

Directly connected High Voltage (HV) customers are also subjected to these higher voltages. AusNet Services currently has 23 such customers with a total of 46 connection points supplied from Zone Substations where REFCL protection will be installed. If not mitigated, these customers' assets could be damaged resulting in safety issues and economic loss.

The solution proposed by the Commission in its Draft Decision is to remove the phase to earth voltage limits during the period of operation of a REFCL that must operate at 'required capacity'. For this network condition, the phase to phase voltage limit will provide the criteria for customer electrical equipment compatibility. We support this approach, and note its simplicity and clarity. We note that the amended EDC will apply from one week after the Final Decision, due in early August 2018.

We understand the Draft Decision may have a significant financial impact on some High Voltage (HV) customers. Accordingly, we note and support the Commission's observations regarding the potential for financial support for affected HV customers.

2 Additional Factors to Consider

This section discusses a number of areas in the Draft Decision where AusNet Services considers additional clarity is required.

2.1 Interpretation of the obligation to use best endeavours to minimise the period where we operate REFCLs

The newly inserted clause 4.2.4(b) requires that a distributor must use best endeavours to minimise the frequency of which¹ the distributor is operating a part or parts of the distribution system under the REFCL condition.

In operating REFCLs there are a variety of decisions that AusNet Services can make that would impact the frequency with which the REFCL will operate. We are concerned that this clause (without further clarification) may be at odds with our obligations to minimise bushfire and safety risks:

- Not operating the REFCL, or operating the REFCL at reduced sensitivity levels, would minimise the frequency of the REFCL operating. As outlined in our Bushfire Mitigation Plan, we intend to operate the REFCLs at different sensitivities throughout the year. For example, during Total Fire Ban (TFB) and code red days, REFCLs will operate at the highest sensitivity level (Fire Risk Mode), they will operate at a standard setting during the declared fire danger period and at a lower setting outside bushfire risk periods. Whilst we consider this the prudent manner in which to operate the network, it is not clear whether this approach (or what alternative approach) is consistent with a prospective obligation to use best endeavours to minimise the operation of the REFCL.
- Minimising the number of faults on the network would also minimise the frequency of the REFCL operating. AusNet Services has a number of safety obligations and financial incentives to minimise the number of faults on its network, including (but not limited to) the *Electricity Safety Act 1998*, the Bushfire Management Plan, Service Target Performance Incentive Scheme (STPIS), F-Factor Scheme and Guaranteed Service Levels. This new clause 4.2.4(b) could be read as placing additional obligations above and beyond our existing obligations in regards to REFCL protected networks. AusNet Services does not consider additional obligations are merited and in any event, it is unclear what the substance of this additional obligation would be.

Relatedly, in the event that such an inconsistency arose, there is no clear and transparent way to determine which obligation is to prevail.

The Draft Decision does not explain the rationale for introducing this obligation, and we request that the Commission clarifies what is intended by clause 4.2.4(b) and how this interacts with our obligations under the *Electricity Safety Act 1998* and *Electricity Safety (Bushfire Mitigation) Regulations 2013* to mitigate bushfire risk. Unless clear value for

¹ AusNet Services suggests that the phrase "frequency of which" in clause 4.2.4(b) be amended to read "frequency with which".

the provision is demonstrated, AusNet Services considers it would be preferable for clause 4.2.4(b) to be removed.

2.2 Reasonable period for Customers to comply

AusNet Services is required by the newly inserted clause 3.5.5 to:

- (a) identify and notify any existing business customer who may be affected by the installation or operation of REFCLs. The distributor must use best endeavours to provide such notification in a timeframe which allows the business customer a reasonable period to plan and implement any required works

AusNet Services has strict obligations and timeframes for demonstrating compliance with the *Electricity Safety (Bushfire Mitigation) Regulations 2013*. This obligation remains on AusNet Services, however AusNet Services cannot place the REFCLs into service until it is confirmed that HV customer installations can safely withstand the elevated REFCL voltages.

Additional clarification is required from the Commission as to what might constitute a 'reasonable timeframe' and what incentives may be most appropriate to encourage HV customers to complete the required works in a reasonable timeframe aligned to the REFCL Program schedule and milestones to meet the regulated compliance dates.

2.3 REFCL terminology

We consider that the definitions used for REFCL and REFCL condition require further clarification or redrafting.

2.3.1 REFCL

The Draft Decision introduces "REFCL" as a defined term, meaning "Rapid Earth Fault Current Limiter or any other technology, which as minimum [sic] satisfies the *required capacity* as defined by the *Electricity Safety (Bushfire Mitigation) Regulations 2013*."

During testing and until the required capacity has been achieved at each of the nominated zone substations, the REFCL will not be operating at required capacity. It remains possible that a particular zone substations may not achieve the required capacity due to technical and network constraints. Additionally, as set out in our Bushfire Mitigation Plan, the REFCLs may not always be operated at the required capacity and there are circumstances in which only the Arc Suppression Coil would be in service. In any of these circumstances, there is uncertainty as to whether the operation of this equipment would satisfy the definition of REFCL in the EDC and therefore voltage variations would be in breach of the EDC.

We consider redrafting this definition would be appropriate to address these issues.

2.3.2 REFCL condition

The REFCL condition is defined as follows:

REFCL condition means operating conditions on the 22kV distribution system caused by the proper operation of REFCLs which results in the neutral

reference of the three phase distribution system moving to allow the phase to earth voltage to approach a value close to the phase to phase voltage. To avoid doubt, the term operating conditions on the 22kV distribution system' in this definition extends up to but not beyond any device or plant which is functionally equivalent to an isolating transformer.

We interpret the term 'proper operation' to mean the REFCL operating in its intended manner (to compensate for a fault and not malfunctioning) and that the voltage rise is the natural outcome of the 'proper operation'. We request clarification that this is the intention of this drafting.

Further, we consider the drafting after the words 'to avoid doubt' is unclear. We understand that this is clarifying that REFCL conditions extend anywhere the elevated voltages are experienced (including into a HV customers premises). We request clarification of the intended application of this sentence.

2.4 Network Data Requirements

Although the Draft Decision places a clear obligation on HV Customers to be ready for operation under the REFCL Condition, it remains important that the customer coordinates with the distributor in formulating its preferred method of compliance. For example:

- protection setting changes will need to be coordinated,
- where isolation transformers are installed, additional protection equipment may be required; and
- where hardening is selected by the HV customer, the distributor will require certain information about the customer's network such that key electrical parameters that influence the ability to operate at 'required capacity' are known.

It is suggested that additional provisions are required in Sections 9.2 and 9.3 of the EDC that place obligations on HV customers to provide the distributor with information explaining how they intend to comply with the new REFCL related requirements and to provide network data such as network charging capacitance, damping and phasing details. This information would be required for the HV Customer's current network as well as any planned changes.