

Jill Porter

Mr Chris Pattas
General Manager
Australian Energy Regulator
GPO Box 520
Melbourne, Vic 3001

26 July 2019

Dear Mr Pattas

Thank you for the opportunity to make a submission on AusNet Services contingent project – Tranche 3 installation of REFCL. This funding is permitted under clause 6.6A.2 of the National Electricity Rules. These costs will be “passed through” to consumers.

Please keep my address details as confidential.

By way of background, I am a dairy farmer from The Sisters in south west Victoria.

On March 17 2018, my family and community was devastated by a cluster of bushfires all associated with electrical infrastructure. These fires destroyed homes, property, livestock, livelihoods and our way of life. At least two of these fires, Garvoc/The Sisters and Terang were due to ageing and failing infrastructure and poorly maintained and inspected electrical assets. The other four fires occurred as a result of vegetation contact with conductors. These fires are collectively known as the “St Patricks Day” fires.

Efficacy of REFCL

I wish to highlight that the roll out of REFCL would not have prevented any of the fires on the night of St Patricks day in 2018.

Nor would REFCL technology have prevented the fires on Black Saturday.

The Powerline Bushfire Safety Taskforce (2011) recommended the REFCL technology. This recommendation was based on **assumption**.

“The data does not provide a breakdown of the number of fire starts by wire-to-wire faults and wire-to-earth faults. The Taskforce has **estimated** that 70% of fires are started by wire-to-earth faults and 30% of fires are started by wire-to-wire faults. The data also **does not** provide a breakdown of fires started by **electric arcs, molten metal particles and electric current flow. The Taskforce has not been able to estimate this breakdown.**”

(Powerline Bushfire Safety Taskforce: Final Report, September 2011).

It appears that these estimations are not accurate, given the causes of the fires involving electrical infrastructure historically, Ash Wednesday (1983), Black Saturday (2009) and St Patricks day (2018).

The research surrounding **arc ignition** did not seek to model any of the Black Saturday fires, its sole aim was to **inform ACR and REFCL research.**

It is also now known that on days of catastrophic risk (ie very high wind, high temperature, high KBDI and low relative humidity), REFCLs are least effective. **REFCL efficacy drops to below 50%.**

If REFCL would not have prevented these types of fires that occur on days of catastrophic risk, then how can the investment be viewed by the AER as “prudent and efficient”?

Cost

Cost of REFCL was initially budgeted at \$151 million (Acil Allen RIS 2015).

Currently,

Powercor

Tranche 1 \$77.3 million

Tranche 2 \$110.5 million

Tranche 3 contingent plan not publicly released as yet

AusNet

Tranche 1 \$97.4 million

Tranche 2 \$123.5million

Tranche 3 \$106.8million (proposed to AER, no determination yet)

Known costs for HV customers for tranches 2 and 3 is expected to be more than \$60 million

Metro Trains has asked Victorian Government for \$45 million to harden its 8 affected substations.

Melbourne Water (tranche 2 AusNet) costs are unknown

This totals \$622.5 million and does not include Tranche 3 for Powercor.

It does also does not include ongoing costs to keep networks “compliant”.

It does not consider the costs of the 4 unresolved issues surrounding conditional approval

- Calibration
- Harmonics
- Sampling and admittance values
- Inverter tripping

AusNet confirmed that there were a number of possible long- term treatments to reduce network harmonics, **however it raised the question as to whether the expense was justified, suggesting that inherent there must be reference to an economic/cost benefit concept when assessing the reasonableness of the legislated requirements.**

AusNet’s network capacitance forecasts indicate that a large number of GFNs will need to be implemented at Tranche 1 and 2 zone sub stations in the 2021-25 regulatory control period to maintain ‘required capacity’.

(source: AusNet presentation, Powerline Bushfire Safety Committee meeting April 4 2019).

AusNet current submission: Contingent project application- tranche 3 raises several issues:

- While the REFCL is compensating for a fault, the healthy phases remain energised and customers remain on supply. **However, there remains a risk the energised phases may be in an unsafe condition depending on the nature of the network fault.** (page 16)
- Tranche 1 has been delivered in accordance with the mandatory compliance of May 1 2019. **However, a number of technical issues have resulted in ESV providing conditional compliance on 6 of the 8 Tranche 1 zone sub stations and an extension of time request has been submitted to ESV for 2 of the 8 Tranche 1 zone substations.** (page 20)
- The total projected Capex for Tranche 1 **now exceeds** the AER approved capex forecast. It is noted that the current Tranche 1 forecasts **do not include costs which may be incurred to resolve the current technical issues.** (page 21)
- A large number of residential developments built in the 1980s have been identified as having underground cable which is **unlikely to withstand REFCL operations** (page 21-22)
- A key difference between the RIS estimates and the actual project costs is that the RIS assumed one ZGFN would be sufficient at most sites, whereas this has not been

the case. In addition, a program of cable replacement has been necessary, which was not anticipated in the RIS. (page 39-40)

- In addition to these differences, our previous analysis also identified the following works that were either not included or under-estimated in the RIS cost assessment: Neutral bus switchboard, REFCL back up protection and interface control systems. (page 39-40)

The 2017 Review of Victoria's Electricity and Gas Network Safety Framework (Grimes Review) highlighted that **“the deployment of REFCLs would now have marginally higher estimated costs than estimated benefit**, assuming no changes in any of the other elements of the Acil Allen methodology”. (page 188 Final Report).

In its Interim Report , the Review indicated **that a measured approach should be adopted to the implementation of REFCLs**, allowing policy settings to be considered with the benefit of greater experience and information. As a draft recommendation, the review proposed that the deployment of REFCL technology be subject to review prior to each tranche by an **independent expert panel appointed by the Minister**. (Page 192)

Recommendation 27

The mandate of the Powerline Bushfire Safety Committee should be expanded to require it to provide annual implementation reports on the deployment of REFCL technology to satisfy the Electricity Safety (Bushfire Mitigation) Regulations. **The implementation reports should include information on costs and risk reduction benefits in light of actual experience**, and an assessment of emerging issues they may require adjustments to the program timing or technical requirements. This first report should be provided through the Director of Energy Safety to the Minister for Energy, Environment and Climate Change by **May 2018**.

Given the ongoing issues and associated costs, and the lack of reporting on actual experience, how can the AER deem this expenditure as “prudent and efficient” spending of consumer money?

Safety Concerns

When an earth fault occurs on a REFCL protected network, over voltage on un-faulted phases occurs and can lead to failure of equipment installed on the network. Such equipment failure constitutes a second earth fault on the network, termed a **cross country fault**, because it is usually remote from the initial fault and always occurs on one of the un-faulted phases. REFCLs can only deal with multiple faults if they all occur on a single phase. With a cross country fault, the network has two phase-to-earth faults at different locations and high currents will flow in both fault locations. (Page 43 AusNet Contingent Plan application Tranche 3).

The Marxsen Consulting HV Customer Report (2017) states “during the 2014 REFCL Trial (Test 217) following the applied earth fault, a cable failed on another phase followed by failure of an ACR. High cross-country flow was experienced.

Also, page 147 of the 2014 REFCL trial refers to it as:

8.4.3 Test 217- fulgurite formation due to a cross country fault.

Test 217 resulted in a fire **not stopped by REFCL, in fact the arc was much more intense due to higher voltage output.**

This highlights a major problem with REFCL being blind to all other faults.

On days of catastrophic risk, multiple faults can happen and faults do not clear one at a time.

The Victorian Bushfire Royal Commission identified that network distribution infrastructure was ageing and failing.

REFCL does nothing to improve the robustness of the network. With the ageing infrastructure, **REFCL poses a very real danger of introducing further risk due to the potential for cross country faults.**

This was highlighted in the AusNet Hardening Strategy document (13.4.18)

“The need for this line hardening was highlighted in the REFCL trials:

“when an earth fault occurs, the REFCL response creates voltage stress on network equipment connected to un-faulted phases, which can lead to a second fault. **Outcomes can be worse than if a REFCL were not installed” 1**

(1 Dr Anthony Marxsen, REFCL Trial: Ignition Tests, Marxsen Consulting Pty Ltd, Monday 4 August 2014, page 93)

Given the potential for greater risk and harm to rural communities from REFCL operation (via cross country faults), how can the AER deem this expenditure as “prudent and efficient”?

Outages

In its initial Tranche 1 application, Powercor stated “the more frequently we operate REFCLs in fire risk mode (ie the greater number of TFB days that occur), the greater the expected detriment to our reliability performance in terms of sustained outages. These negative impacts will be exacerbated for customers on long feeders”.

There has also been some disabling of automated switching between two supply feeders, in order to allow the REFCL to operate as designed. This will potentially affect community's reliability of supply. Reliability is important to a community both from a safety and also an economic perspective.

On February 3 2019, a 'hard to find' fault on the Eaglehawk feeder (north of Bendigo) resulted in an extended outage of over 8 hours in the middle of a 40 degree day, as linesman patrolled the feeder to try and locate the fault. No fault could be found, and the REFCL was bypassed. Subsequently a fire occurred later in the day at the fault. The community was left without power for hours and safety and health may have been adversely affected.

I seek to highlight to the Australian Energy Regulator of the inefficient spending of community money on a technology which will not give sufficient protection to the people and assets in rural communities on days of catastrophic risk.

The AER and ESV has a MOU which must be strengthened and used in the best capacity in order to protect communities from devastating fires caused by electrical infrastructure.

The VBRC called for Recommendations 27-34 to be implemented in order to address the ageing and failing infrastructure of electricity distribution businesses. REFCL does not address this issue, it simply attempts to minimise a fire start once a fault has occurred.

All parties should be working collaboratively to ensure that the networks are ROBUST and standards, maintenance and inspections are in place in order that we minimise faults from occurring.

The AER is an economic regulator and therefore makes determination on this basis only. In this case of REFCL technology where **the costs clearly outweigh perceived benefits**, surely the economic Regulator has a responsibility to consumers to make the relevant State parties aware of this. From a consumer perspective, it is not sufficient to say the costs should be passed through because the State regulations demand it. How are community fears and concerns heard and acknowledged if both the economic and safety regulator cannot work together for positive and **SAFE** outcomes.

REFCL and ACRs cannot be "instantaneous" and will only operate after a fault has occurred.

As my community well knows, once the fault happens, it is too late, and the subsequent trauma, damage and harm is immense. This must be recognised by both the AER and ESV.

Yours sincerely

Jill Porter

