
Rapid Earth Fault Current Limiter (REFCL) - 22kV Feeders Fuse Savers Program

Regulatory Investment Test for Distribution
**Notice of Determination under clause
5.17.4(d) of the National Electricity Rules**



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REFCL FUSE SAVERS PROGRAM – RIT-D NOTICE OF DETERMINATION

The proposed works for the REFCL 22kV Fuse Savers Program relate to the feeders served by the following 13 zone substations, where the reliability issues are most significant:

Tranche 1

- Kilmore South;
- Seymour
- Wonthaggi;
- Wangaratta;
- Woori Yallock;

Tranche 2

- Eltham;
- Ferntree Gully;
- Bairnsdale;
- Lilydale;
- Moe;
- Ringwood North;
- Wodonga Terminal Station; and
- Belgrave; and
- Mansfield².

The total program of work is expected to be approximately \$11.1 million, and therefore will be subject to the Regulatory Investment Test for distribution (RIT-D) in accordance with the National Electricity Rules (NER). As the project cost is expected to be less than \$12 million, we are not required to publish a Draft Project Assessment Report and will instead publish a Final Project Assessment Report.³

2 Identified need

AusNet Services' distribution network operates in a geographical location exposed to extreme bushfire risk, warranting significant investment to reduce the risk of electricity assets causing a bushfire.

The Electricity Safety (Bushfire Mitigation) Amendment Regulations 2016 came into effect on 1 May 2016, amending the Electricity Safety (Bushfire Mitigation) Regulations 2013 (the Regulations). Among other obligations, the effect of the amendment requires AusNet Services to install REFCL technology at twenty-two specified zone substations and meet specific REFCL performance requirements (the Required Capacity) designed to reduce the fire start potential of electricity distribution assets.

Fuse savers are designed to prevent transient faults on a spur circuit resulting in sustained outages under conditions of medium or low current faults. The existing fuse savers were introduced and have been installed in the distribution network over the last eight to ten years. However, they are not suitable with REFCL technology due to slow communication between the other two phases, leading to very slow gang operation which can create imbalance in circuits to trigger the tripping of the entire feeder by the Ground Fault Neutraliser (GFN) – an important component of REFCL technology.

Unless remedial action is taken, adverse customer reliability will result from the continued operation of existing fuse savers on feeders served by Tranche 1 and Tranche 2 zone substations. In particular, our analysis shows that the financial penalties resulting from the Service Target

² Mansfield was part of T3 REFCL that was brought forward to T2.

³ Clause 5.17.4(n).

REFCL FUSE SAVERS PROGRAM – RIT-D NOTICE OF DETERMINATION

Performance Incentive Scheme (STPIS) of approximately \$11 million per annum at the relevant zone substations is at least partially attributable to the impact of existing fuse savers. The reliability impact for our customers is therefore significant.

The identified need, therefore, is to address the adverse reliability impacts that result from the continued use of existing fuse savers for REFCL protected zone substations completed in Tranche 1 and 2 of the installation program.

3 Required works

In order to address the identified need, it is necessary to install a new generation of fuse savers, Siemens 3AD8 modules, with suitable capabilities to operate significantly faster and in coordination with other two phases. These fuse savers provide the following benefits:

- Detect faults with a cutting-edge, high-speed protection algorithm which results in unsurpassed ultrafast fault clearing in as little as 10 milliseconds.
- Works in partnership with a fuse to increase network availability by preventing the fuse from blowing on transient faults.
- Self-powered from ultra-low line current with rechargeable primary cell battery on its communication module that enhance duration of operation.
- SCADA connection via the Remote-Control Unit thereby providing remote operation control and status visibility to meet regulatory requirement for Total Fire Ban settings.
- Provide multi-phase ganged protection functionality compatible with REFCL operation in addition to synchronous manual operation.

The installation of the new generation of fuse savers will be combined with other works to optimise the reliability outcomes and maintain network balance at the lowest total cost. At a high level, the proposed works will include:

- Install new generation fuse savers, Siemens 3AD8 modules, including the replacement of old fuse savers;
- Install ACRs (Noja RC10 or RC20);
- Install gas switches;
- Reconductor spans;
- Remove fuses
- Solid Links; and
- Other minor works to facilitate the above works.

The installation of ACRs is recommended at selected locations to provide reliability improvements, where fuse savers are not cost effective or technically feasible. At other locations, options other than upgrading the fuse saver may be more cost effective.

4 Screening for Non-network Options

In applying the RIT-D, the relevant distributor is required to publish a non-network options report, to screen for potential non-network options, unless it reasonably determines that there are no credible non-network options. Where a distributor makes such a determination, it must publish a notice setting out the reasons for its determination, and any methodologies and assumptions applied in making that determination. In accordance with clause 5.17.4(c) of the NER, AusNet Services has determined that there are no credible non-network options in relation to the REFCL 22kV Feeders Fuse Savers Program.

Our reasoning for concluding that there are no feasible non-network solutions are:

- The reliability issues identified from the incompatibility of the existing fuse savers with REFCL operation can only be addressed through network investment, given the numbers of customers affected and the large number of tee-offs;
- While network balancing issues may be addressed by providing customers with batteries and solar, these solutions are impractical given the radial feeder configuration (large number of tee-offs) and conductor annealing problem which require fuse protection.
- As the proposed capital works address the impact of REFCL operation on our distribution network and its service performance, non-network solutions cannot provide an effective substitute for the proposed capital works.
- The AER accepted our proposed inclusion of fuse savers in our contingent project application for Tranche 3 of the REFCL program, which reinforces our view that there are no non-network solutions available.⁴

In accordance with the NER requirements, we note that these reasons are not dependent on any particular assumptions or methodologies.

5 Next Steps

For the reasons set out in Section 3, AusNet Services has determined that there will not be a non-network option that is a credible option, or a non-network component that forms a significant part of a potential credible option, in respect of the REFCL 22kV Feeders Fuse Savers Program. In accordance with clause 5.17.4(c) of the NER, therefore, AusNet Services will not be publishing a non-network options report as part of the RIT-D for this project.

Any questions or feedback on this determination notice should be submitted by email to ritdconsultations@ausnetservices.com.au.

The next stage of the RIT-D process is the publication of the Final Project Assessment Report (FPAR)⁵, which is required to provide the information set out in clause 5.17.4(j) of the NER, including:

- A description of the identified need for investment.
- The assumptions used in identifying the need for investment.
- A description of each credible option assessed, and their costs, that AusNet Services considers could potentially address the identified need.
- The results of our net present value analysis and accompanying explanatory statements regarding the results.
- Identification of the proposed preferred option that meets the identified need and the RIT-D requirements.
- The contact details for a suitably qualified staff member to whom queries on the report may be directed.

AusNet Services intends to publish the FPAR in March 2022.

⁴ AER, Final Decision, Contingent Project Application, Installation of Rapid Earth Fault Current Limiters (REFCLs) – tranche three, 3 October 2019, page 46.

⁵ As noted earlier, the cost of the program of work is such that we benefit from an exemption to publish a DPAR under clause 5.17.4(n) of the NER.