30 December 2014

Department of Economic Development, Jobs, Transport and Resources,
121 Exhibition Street Melbourne VIC 3000
(GPO Box 4509 Melbourne VIC 3001)

By upload to DEDJTR website.

Dear Sir/Madam,

RE: Regulatory Impact Statement on Electricity Safety (Bushfire Mitigation) Regulations 2015

United Energy (UE) appreciates the opportunity to respond to the Regulatory Impact Statement (RIS) for the proposed amendments to the Electricity Safety (Bushfire Mitigation) Regulations 2013. UE does not support the proposal put forward by the Department of Economic Development, Jobs, Transport and Resources (DEDJTR) to introduce regulations that will ensure Rapid Earth Fault Current Limiter (REFCL) technology is utilised by Victorian electricity distribution businesses within an acceptable timeframe to reduce the number of power line faults that start bushfires.

Whilst we do not have any objections for the need to increase safety we do not support the introduction of regulations that specify particular use of a technology to achieve this outcome. In our view there are some unintended consequences of the proposed regulation, these are outlined below. Further we are constantly exploring all options to improve safety outcomes for UE customers and do not require specific regulation to deliver this outcome.

UE has significant expertise in the use of REFCL technology. We are the first company in Australia to successfully implement this technology within our Network. Despite this we do have some concerns regarding the details of the proposed regulation. The regulations do not properly consider the different operating modes of the REFCL technology and how these may need to change depending upon the bushfire risk. Different operating modes will impact network supply reliability. It is also important to understand that some technical and practical implementation challenges exist which could hinder the rollout programme. These issues include:

- The draft regulations do not clearly define if the ‘required capacity’ is only required at specific times of the year when bushfire risk is high or all year round. It only says that testing is required prior to the specified bushfire risk period. UE would prefer the regulations only require REFCL operation during days of high bushfire risk if the objective is only to prevent fires starting on high bushfire risk days.
- Compliance all year round and on days that are not high fire risk will impose a number of difficulties and will increase costs with little or no bushfire risk reduction benefit. For example achieving the required fault detection sensitivity may require the application of special settings which will increase the risk of false fault detection which impacts reliability of supply. While this compromise might be acceptable on days of high fire risk, it might not be acceptable all year round. During humid, foggy and drizzling rain periods network damping increases caused by leakage current across insulation. This will decrease fault detection sensitivity making it more difficult to satisfy the ‘required capacity’. Under such conditions high fire risk is uncommon thus it should not be necessary to satisfy the ‘required capacity’ under wet weather conditions.
Based on the current equipment available and existing network design it is almost certain that each distribution business will operate their system in modes that will allow fault current to increase briefly for certain sustained faults on low bushfire risk days to allow existing protection devices such as ACRs and fuses to operate as intended to locally isolate faults to minimise reliability impacts of network faults. During these periods the 'required capacity' criteria will be relaxed. It is unclear if this will be a breach of the regulations.

There will be times when the equipment needed to satisfy the 'required capacity' is unavailable due to maintenance or testing or due to faults or suspected faults. Planned maintenance should always be undertaken during low bushfire risk periods although faults can occur at any time. It is impossible to guarantee the 'required capacity' will be available 100% of the time. Indeed it is not even possible to ensure an electricity supply will be available 100% of the time. If very high availability is required then the system will need to be constructed with redundant systems that can be operated to improve performance. It is unclear what redundancy and system availability is required although the cost forecasts do not appear to include any redundancy.

Although UE is experienced operating its REFCL system and it is currently operating reliably this has taken many years. Even today UE does not have complete confidence the system will be available on 100% of the days it is needed to manage fire risk. Other businesses will also take some time to gain the experience required to achieve high system availability. The technology is also continuing to undergo development and there will be times when problems are identified and some time will be needed to resolve them. For these reasons ESV should be provided with authority to provide distribution businesses dispensation if there are technical issues that degrade performance resulting in the inability to satisfy the 'required capacity'.

In regards to the RIS, also have specific comments in some areas:

**Section 2.6.3 – Installing new generation REFCLs to protect polyphase lines**

The fire safety benefits associated with the REFCL at Frankston South was considered in the original business case (section 4.2.4 – Fire Start Benefits). Nonetheless the bushfire risk at Frankston South is only moderate thus bushfire risk reduction was not the major business case driver. Bushfire risk reduction was one of many benefits considered.

**Section 3.4 – Reduction in public risk / Improving the reliability of supply on high fire risk days**

UE would like to clarify claims made in relation to reliability benefits from REFCLs particularly regarding substantial improvements in reliability indices such as SAIDI and MAIFI. The following points should be noted:

i. Although the REFCL at Frankston South was commissioned in early 2010 the reliability data available is a relatively small sample size thus statistical confidence levels regarding impact on reliability remains low. A few random faults driven by other factors can impact the apparent reliability benefits provided by the REFCL.

ii. UE has had an increase in cables failing when the REFCL is compensating for a fault. There have also been some distribution transformer failures and one ACR failure. The increase voltage stress on equipment that occurs while a REFCL is compensating for a fault can trigger these failures in equipment if the electrical insulation is old or is in poor condition or is not suitably rated.

iii. UE has observed a reduction in momentary outages.
iv. UE has observed a reduction in sustained outages caused by animal and weather related events. This might help to improve reliability on days of high fire risk when wind speeds are high although this is only an assumption.

v. If operating the REFCL at very high sensitivity levels as required to satisfy the draft regulations, it is likely protection will trip feeders unnecessarily on some occasions. The installation at Frankston South does not currently comply with the regulations thus reliability benefits obtained at Frankston South might not be achievable at other locations.

vi. There might be some long term reliability benefits from REFCL technology but there are many unknowns and it is currently difficult to confidently claim what impact REFCLs will have on reliability in the short and long term. It will vary depending upon operating mode, fault type, network construction (e.g. underground vs. overhead) and location. Care needs to be taken if any business case for the installation of REFCLs is heavily dependent upon obtaining reliability benefits.

- Section 6.2.2 – Analysis of benefits – enhancing network protection for polyphase power lines (option 1) / Improvement in bushfire risk

The substantial research undertaken at Frankston South in 2014 and Springvale and Kilmore in 2015 show that REFCLs will reduce the number of power line faults that start bushfires. A risk reduction for 22kV phase to earth faults of 90% appears achievable although is difficult to quantify using the research data. Testing has only been undertaken under specific conditions and in real life there are many types of fault. The comment regarding Auckland University that 91% of all earth faults were compensated successfully cannot be used to support a bushfire risk reduction of 91%. The Auckland University research was not based on bushfire research. It is recommended that the performance of in service REFCLs be monitored over time to confirm that the expected benefits are obtained.

For further information in relation to this submission please contact David Wilkinson, Senior Protection and Control Engineer on 8846 9738 or e-mail david.wilkinson@ue.com.au.

Kind Regards,

Andrew Schille
General Manager Regulation and Corporate Affairs