POWERLINE BUSHFIRE SAFETY COMMITTEE

MINUTES OF MEETING No. 02/2017

Held: Tuesday 14 March 2017, at 9:00 am
Location: Level 5, Building 2, 4 Riverside Quay, Southbank

Attendees:	Status	
David Harris	Member	Chairman
Gaye Francis	Member	Director, R2A Pty Ltd
Steve MacDonald	Member	Engineering Support Manager at Orion NZ Ltd
Tony Marxsen	Member	Director, Marxsen Consulting Pty Ltd
Claire Noone	Member	Principal, Nous Group
Gary Townes	Member	Director, Facio Pty Ltd
Gail Moody	Member	Deputy Secretary, Corporate Governance and Infrastructure, Department of Justice & Regulation
Ian Burgwin	Observer	General Manager Electrical Safety & Technical Regulation, ESV
Paul Fearon	Observer	Director of Energy Safety, ESV
Tom Hallam	Observer	General Manager Regulation and Network Strategy, AusNet Services
Steven Neave	Observer	General Manager Electricity Networks, CitiPower and Powercor
Neil Saul	Substitute Observer *	Powerline Bushfire Safety Program, DELWP
Robert Skene	Secretariat	Senior Technical Advisor, ESV

* observing in the absence of Ashley Hunt as the DELWP observer.

Agenda item Discussed:

Item	Matter	
Part A	Committee members and secretariat only	
1	Committee Discussion	David Harris
Part B	Committee members and Observers	
2	Introduction	David Harris
3	DB progress to-date	Steve Neave/ Tom Hallam
4	Meeting practices	David Harris
5	Legislation	David Harris
6	Cross country faults	Tony Marxsen
7	NZ GFNs	Steve MacDonald
8	Discussion	David Harris
9	Future meetings	David Harris

Part A - Committee members and secretariat only

1. Committee Discussion

1.1. Committee Charter

The Chair confirmed the Committee's Charter which had not changed notwithstanding the pending introduction of Civil Penalties legislation associated with the requirements contained in the Electricity Safety (Bushfire Mitigation) Amendment Regulations.

Whereas in the current legislation exemptions were at the discretion of the Director of Energy Safety (DoES), the new legislation proposed defines two forms of relief. The first is an exemption from requirements and the second is a change in the timing of implementation.

Exemptions can only be granted by an Order in Council whereas changes in timing can be granted by the DoES ESV in consultation with the Minister.

1.2. Scope of meetings

The Chair reaffirmed that the committee's role remained and that it was to be well informed on the relevant matters to be in a position to provide advice when requested to the DoES if and when the industry seek relief from their obligations.

1.3. Committee procedural practices

The Chair suggested to members that it was timely that the process which the committee adopts for considering and providing advice to the DoES be developed. It was a consensus that the process for providing advice on granting relief should include consultation with industry to ensure the role of the committee was understood.

To ensure that when requested that advice is given efficiently it was agreed that the information relevant to a matter is collated for the benefit of the members. The Secretariat undertook to do this for the committee at the time that the advice is sought.

Action: The Secretariat to commence the drafting of a process/protocol for the provision of advice to the DoES, when requested.

1.4. Other

It was agreed that each meeting will start with a member's only briefing, with a look forward of any matters that are likely to be raised by industry.

Action: The Secretariat to provide members a list of matters where the industry is likely to seek relief from requirements with each meeting agenda.

2. Introduction

2.1. Attendance and apologies

Each member and observer introduced themselves.

The Chair welcomed the member Gail Moody to her first committee meeting,

Neil Saul extended an apology for Ashley Hunt.

2.2. Previous meeting minutes

Minutes of the previous meeting were circulated out of session and comments received from some members and observers.

The Chair advised members that a number of minor changes were made to the minutes to provide clarity on certain matters.

There were several suggested amendments which have not been included as they were not considered to be about the substance of the meeting as a record, rather about the intent of the matter discussed.

The Chair reminded members and observers that the minutes were solely a reflection of the meeting proceedings and where appropriate contained a summary of papers presented only.

The Chair requested members approve the minutes as a record of the meeting held on 5 December 2016.

Committee decision: Passed without dissent.

2.3. Outstanding actions

Meeting date	Matter	Action	Status
05/12/2016	**5. Legislation** Overview of; • Electricity Safety (Bushfire Mitigation) Amendment Regulations, • Statement of Reasons, and • f-factor	Copy of the presentation to be distributed with the minutes and made available on the ESV PBSCs web page.	Copy of the presentation distributed to Members and Observers with the minutes. Copy of the presentation posted on the ESV PBSCs web page.

Meeting date	Matter	Action	Status
	6. Rapid Earth Fault Current Limiter (REFCL) research	Copy of the presentation to be available in January 2017 and forwarded to members (size limitations permitting) and made available on the ESV PBSCs web page.	Copy of the presentation distributed to Members and Observers with the minutes. Copy of the presentation posted on the ESV PBSCs web page. The large hyperlink data files will be available via the new ESV web site.
	7. Electricity Distribution Business - progress to-date.	Copy of the presentations to be distributed with the minutes and made available on the ESV PBSCs web page.	Copy of the presentations distributed to Members and Observers with the minutes. Copy of the presentations posted on the ESV PBSCs web page
Outcome legend			Open
			Closed

ESV has posted committee papers, including the committee's charter, meeting agenda, minutes and copies of presentations on its current web page. Due to size restrictions the files hyper linked within some papers are not currently available at the time of this meeting.

ESV has created a new ESV web page with the capability of linking to large files. It is expected that the new web page will go live this week. The secretariat undertook to advise members when the new web site contains all of the linked material.

Action: The Secretariat to advise members when the new web site contains all of the linked material.

3. Electricity Distribution Business - progress to-date

Tom Hallam and Steve Neave provided a joint update on progress in implementation of the requirements contained in the Electricity Safety (Bushfire Mitigation) Amendment Regulations, as many of the matters were common to both distributors.

The presentations given were related to REFCLs and responses to other matters as requested.

Current Trial sites – Current Status

AusNet Services

AusNet Services advised that their first Woori Yallock (WYK) GFN has been commissioned and has been operating since January 2017. The current sensitivity achieved is around 3.5 amps for a single phase fault.
AusNet Services also advised that a second GFN will be required to achieve the required performance as a result of the replacement of bare powerlines with covered conductors associated with the extensive government PRF programs.
AusNet Services stated that a significant amount of extra capital works will be required to achieve the final prescribed sensitivity of 0.5 amps. The cost was said to be a function of the large number of switching zones deployed by AusNet Services in its Distribution Feeder Automation system.
For example WYK has:

- 47 switching zones,
- 36 sites where the phases need to be rotated,
- 6 site where a third phase needs to be installed,
- 12 three phase balancing capacitors and 7 sites where fuses are going to be removed and replaced with solid links.

AusNet Services stated that on the completion of those works it would be clear if the required sensitivity is achievable. It is expected that these works will be completed for the 2017/18 summer.

It was said that AusNet Services operating system typically has more switching zones than in the Powercor network.

Technical Issues to date

A slide was displayed summarising the issues to date, the nature of the issue, the response and its impact for both AusNet Services and Powercor trial sites.

The distributors stated that the recent problems mostly involve software and hardware issues with the invertor. The experience has been that problems often manifest themselves at the same time with investigation requiring an iterative process of elimination to bring about a solution.
The point was made that there is a heavy reliance on Swedish Neutral for support to solve these problems.

The committee's attention was drawn to the large number of "trips" resulting from transient faults on the system.

Powercor

There are two trial sites, Gisborne (GSB) and Woodend (WND).

Powercor stated that GSB has been in service since September 2016, at an availability rate of about 75%, with a period of a month where it was out of service through a GFN inverter problem. The current sensitivity is around 1 amp and less than the prescribed sensitivity. GBS has about 350 km of powerline feeders (~10% covered conductor) and was selected as it was believed that with its low capacitance it would be easy to balance.

The operating mode for the GSB trial was said to have been the "fire mode", where on detecting a fault, the GFN performs a soft fault confirmation and when it fault is confirmed it trips the feeder, isolating the connected customers.

Powercor stated that the WND stress testing has been completed. The network was said to have about 1000 km of powerline feeders, a lot which is underground and has a lot of capacitance. The GFN was said to be currently out of service as it can't be tuned via the GFN and requires the installation of capacitive balancing units. Powercor believed that the GFN will be in service in May 2017.

Balancing units

A slide was provided describing the product and the issues.
It was said that these are new inventions and are being deployed to achieve a fine balance of the network. The first designs were said to have failed and new prototypes have been trialed and orders place for 9 units with an expected delivery of April 2017.

The presentation emphasised that the installation of these balancing units was critical to achieving the required capacity. Were they not to deliver the required balance then Powercor expressed the view that is was not known how the required capacity would be achieved at other zone substations with a similar characteristics.

Operating Modes

Powercor presented their three operating modes; Fire risk mode (intended for Total Fire Ban days), Normal mode, and Bypass mode.

Powercor emphasised that at this stage these modes of operation were those intended, but could vary with additional learnings to develop the optimum settings and the effect on reliability.

REFCL operation in "soft fault confirmation" mode (developed specifically for Australia) and "classic fault confirmation" (4 amp) mode was discussed. It was said that the "classic" confirmation better enabled the determination of the location of the fault.

AusNet Services confirmed that they have developed similar operating modes for "Fire risk" and "Bypass", but have a slightly different "Normal" mode where 3 amps fault confirmation is used, driven by their Distribution Feeder Automation (DFA) scheme.

AusNet Services indicated that they would be upgrading their ACRs to ensure they can see the lower fault currents that occur with the REFCL operation to maintain the current reliability performance. This development of the ACRs, to detect these fault currents, was said to have not been done elsewhere in the world.

Timeline & Contingent Project

The distributors said that the acceptance by ESV of the distributor's Bushfire Mitigation Plans containing the future REFCL deployment allowed the reopening of the price determinations.

The distributors said it was their intention to lodge contingent project applications with the AER by the end of March 2017.

The Chair sort clarifications of the distribution of the slides in this presentation, as the slides are marked "commercial in confidence". The distributors confirmed the markings were simply printed on their standard slide template and that the slides could be distributed.

The distributors also expected that the AER would make their contingent project overviews available to the public within weeks following their lodgment.

Both AusNet Services and Powercor presented a graphs showing the zone substations (ZSS) targeted in each of the three deployment tranches.

AusNet Services.

Tranche 1.
AusNet Services said they had a target of 33 risk points, which is in excess of the 30 required by legislation before 30 April 2019. AusNet Services expressed their expectation that there would be three ZSSs commissioned by the 2018/19 summer period, operating at the desired sensitivity. AusNet Services stated that the biggest risk to the physical delivery of tranche 1 is the Seymour ZSS which requires an entire station rebuild to accommodate the GFN installation. As such it was said that there is consideration being given to commencing work on one of the ZSSs in tranche 2, although funding for this has not been included in the current contingent funding applications.

AusNet Services confirmed that these contingent project applications would include the costs of isolating transformers intended to protect the 10 HV customers associated with the tranche 1 ZSSs.

Powercor

Tranche 1.
Powercor said they have a target of 30 risk points by 30 April 2019 in line with the requirement contained in the regulations.

Powercor indicated that their contingent funding submission for tranche 1 would include the ZSS at Eaglehawk (5 risk points), currently shown on the graph presented as in tranche 2. It was further indicated that not all of these ZSSs may be delivered by 30 April 2019.

Powercor indicated that they expected to have both Gisborne (GBS) and Woodend (WND) currently in trial operating at the required capacity within the next couple of months. If it is not possible to achieve this then there is a much greater issue for rest of the program.

The ZSSs at Winchelsea and Colac were said to require extensive primary work at the station to each accommodate the installation of two GFN.

Powercor advised that their contingent project submission for tranche 1, required to be submitted by 31 March 2017, included 9 GFNs and a large quantity of surge arrestors.

The expenditure for GBS and WND was said to have been used as the basis for the costing in the tranche 1 contingent project submission, notwithstanding the fact that these stations have not been fully commissioned.

A slide was presented showing the current key statistics for the tranche 1. In regard to the surge arrestors shown on the side, it was said that the replacement rate is expected to be on average 60% with a range from 20% and 80% for individual ZSSs. It was said that the quantity to be replaced followed a review by external consultants. The quantity of the required replacement of the surge arrestors was a

significant issue in the bushfire amendment regulation's RIS. Similarly it was said that not all of the ACRs would require replacement.

The number of GFNs required was said to have been determined following the development in the VESI TWG of a guideline with the threshold of ~130 amp of network capacitance for each GFN.

The slide shows the number of HV customers supplied from each ZSS. Powercor mentioned whilst this has been mentioned last year and as there is still not a resolution to this matter, the contingent project submissions to the AER include a funding request for isolating transformers.

A member queried the large capacitance of the WIN ZSS, and Powercor stated that this was related to the replacement of bare powerlines with covered conductors associated with the extensive government PRF programs.

Civil Penalties Bill

The distributors presented a slide on the Bill which covered the; unintended consequences, technical challenges in achieving the required performance "capacity" of 0.5 amps, the single supplier vulnerability, and the Electrical Distribution Code and HV customers.

These matters were said to have been discussed directly with the Minister's Office by the distributors and now raised with the committee to give an outline of the businesses concerns.

Technical challenges:
The distributors expressed the opinion that it was inappropriate to establish a penalty of that magnitude for a performance which has not been done before in a practical situation, and does not in their view reflect the R&D nature of the application of REFCLs for bushfire reduction.

Single supplier:
There is only one business at this stage that can currently supply a REFCL product that is believed capable of delivering the required performance. This business is very small with only 9 employees and the distributors expressed a concern that it could fail.

Electrical Distribution Code and HV customers:
The distributors said this was a major issue that has not been resolved despite conversations with the DELWP, Victorian government, and the ESC. The distributors advised that a lack of resolution of the HV customers matter, either through isolation or testing and hardening, will have the effect that they will not be in a position to turn on the REFCL and operate it at 0.5 amps as it will breach the Code.

Unintended consequences:
The distributors said that legislation has the potential for a "deliver at all costs" approach and that spending a lot of money without doing adequate development associated with the new technology.

The distributors expressed the view that to ensure that the required timelines are realised there is little time for staff to explore and develop alternate REFCL suppliers.

Distribution Code & HV customers

In addition to that covered earlier in this and previous meetings, the distributors' advised that the ESC has declined to act on the "no action letter" request, and that they were not going to as a matter of urgency make changes to the Code. The ESC has recognised that the REFCL legislation does take precedence, however the distributors expressed the view that this gave no relief from their obligation and exposure to court action as a result of damage to a customer's equipment or any consequential financial loss. The distributors said from their point of view this leaves them with one possible solution through the installation of isolating transformers. In essence this would require the construction of mini substations.

The Chair sought and received clarification from the distributors of the function of the isolating transformer and its ability to protect the customer's installation.
A committee member offered a more detailed explanation of the functioning of an isolating transformer. It was said that one of the consequences of installing an isolating transformer is that the HV customer overhead network will not receive the fire reduction benefits from the REFCL protected distributors network.

The distributors added that it was their view that without a change to the Code they would be still liable for any damage that might result in a HV customer's installation even if that customer upgraded their equipment.

The DoES sought clarification as to the impact of installing isolating transformers on "cross country faults". A committee member explained isolating transformers were not an "off the shelf" item and as such there are uncertainties in their introduction. It was said that they are not small and in effect that it is building another small ZSS somewhere near the boundary of the customer's site. A lot of HV customers' sites were believed to not have the room to install these transformers.

The distributors expressed the view that this was now on the critical path for them, as they were running out of time and had been forced down this path as there was no plan to have the HV customer's equipment changed, and it was not certain that the Code would be changed to accommodate the higher voltages.

A slide showing the magnitude of the HV customer issue on the AusNet Services network was discussed. It was said that this situation was similar to that for both the distributors and that this was a desktop study only and was not meant to imply a detailed knowledge of HV customers installations as the distributors do not have those details. AusNet Services advised that they have discussed with the AER the cost comparisons shown on the slide for treating HV customer's sites, with $105M for isolating transformer against $23M for review and upgrading of HV customer equipment.

Another slide showing the breakdown of AusNet Services HV customers by tranche was shown and explained.

A side showing Powercor's HV customers was shown and discussed pointing out that some customers had multiple metering points. Powercor reiterated their advice at the last PBSC meeting that they do not have detailed records of the HV customer assets and have no obligations regarding them whatsoever. However Powercor advised that they are being forced to start to make enquiries about those assets and are writing to all of their customers advising that they are going to install REFCLs, and that they may need to have a look at their installation.

The view was expressed by one distributor that one of the HV customers supplied from the Castlemaine ZSS was very old, unlikely to have equipment compatible with a REFCL and unlikely to be able to fund an upgrade themselves.

Network Solution

A slide regarding HV isolating transformers was shown with Powercor confirming that significant R&D will be required in the use of these transformers for this purpose, that they cannot be purchased “off the shelf”, that land for installation will be an issue, and that they know that they are not the ideal solution but are the only one they have control over: They said that they believe that they can’t go to the AER and request funding to upgrade customers equipment.

Some of the significant time impacts were discussed; unknown procurement lead-times, land acquisition and council requirements. It was pointed out that building a substation take multiple years and it may not be practical to meet the required time frames.

A committee member asked why it was not possible to work with the HV customers to determine which assets were at risk, what the customer need to do and then go together to the AER to say this is the best solution to manage the bushfire risk. Powercor responded that there had been no lack of trying with multiple conversations with DELWP, government and the ESC to try to get some action on this matter, even though Powercor said it was not their issue. However because there is intended to be a penalty issue associated with timing of the installation of REFCLs it is by default becoming a distributor problem. AusNet Services confirmed their understanding that the AER took a dim view of all of the networks customers funding specific customer upgrades. Without a change to the Code requirements distributors could not require HV customers to upgrade their equipment. Currently the HV customers are not required to upgrade or test their equipment.

The DELWP observer asked a question regarding deemed contracts distributors have with their HV customers. Specifically it was asked if those contract would have provisions to make the HV customers make reasonable adjustments to their sub-networks to meet the characteristics of the distribution network. AusNet Services responded that their legal advice was that the Code and the deemed contracts placed requirements on the distributor and the HV customer to comply with the Code. The distributors said that the regulations requiring the installation of REFCLs clearly only apply to the distribution businesses and do not apply to the HV customers. As such it was said that the deemed contracts did not provide a remedy. The DELWP observer asked that if the deemed contracts say that the HV customer must make reasonable technical requirements for adjustments for characteristics of the distribution network, and in turn if those characteristics of the network are altered to meet a regulatory obligation, doesn’t it follow then that even though the regulations don’t speak directly to the responsibility of the HV customer that it flows from the deemed contracts that way. AusNet Services responded that it was their current legal advice that this is not the case. Powercor confirmed that it was also their advice, both internal and external, was that that was not the case, and went on to say that the Code is the Code and without the Code being amended the HV customer has no obligation to do anything.

The Chair sort confirmation that the obligation placed on the distributors was to comply with a performance specification and not use a particular hardware. AusNet Services confirmed this was their view. The Chair then further queried whether this is being argued that in consequence it would not obviously lead to an obligation on the customer for a particular change of network configuration. AusNet Services confirmed this as their view.

A committee member commented that in the current framework for economic regime that the AER approves a certain amount of revenue based on the asset base owned by the network and as these HV customer assets are not owned by them there is no way to pay for the estimated $20M upgrade of the HV customer instillation but there is a way to pay for the $100M introduction of isolating transformers. So as such the installation of isolating transformers would not be a good outcome but it is the only outcome identified that the current framework supports for cost coverage for the distributors.

The DoES suggested that a collaborative approach could work but the question is who pays, adding that in the current regulatory system it was unlikely that all of the HV customers would want to pay. The DoES invited Tony Marxsen to discuss the work ESV had commissioned regarding HV customer installations. Tony discussed the survey of a small number of HV customer sites designed to add clarity about some of the safety issues involved, but added that the fundamental issue won't be changed, only fleshing out the scale of the issues on some typical sites.

AusNet Services expressed that the hurdle was not simply funding, there was also the timelines whilst having to negotiate with the HV customers in regard to testing, funding, and closing down their installations for the upgrade works, while there is no actual piece of regulation that they can take to a HV customer and say this is required. So they expect those negotiations are unlikely to meet our current installation timeline obligations without a Code change.

A committee member asked that if the distributor put in a REFCL and the HV customer plant failed as a result then isn't this the HV customer's problem? AusNet Services responded that when the REFCL is in operation then the voltages will be outside the Code which then leaves the distributor liable. The member then sort confirmation that there was a conflict between the Code and the requirements in the regulations. AusNet Services confirmed this to be the case in their view and added the damages would not be confined to the equipment but could include the economic damage to the HV customer.

Extension to Tranche 1

Powercor indicated their intention to write to the DoES seeking an exemption to the timelines for tranche 1. A slide graphically showing the time based phases of the tranche 1 program, including an intended six month extension in time. Powercor indicated that this would provide no additional risk to their customers as the extra six months sought was over the winter period where they would not be operating the REFCL in Fire risk mode.

Powercor explained that in the current tight timeline required to meet the regulatory prescribed dates would require the network testing and commissioning to be carried out over the 2018 summer period. They stated that they were not prepared to do this from a fire risk perspective. Powercor also advised that it was for the whole tranche 1 program and as the distributor would not be operating the REFCL in the fire risk mode the fire risk to the community would be minimal. Another committee member sort clarification if extensions to subsequent tranches were also being considered. Powercor responded that it was too early to say at this time with matters like the HV customers unresolved in regard to future tranches.

Alternate Technical Solutions

AusNet Services mentioned that their work had identified a number of ZSSs where bushfire risk is very geographically concentrated and there are potentially alternate lower cost solutions to deliver what they considered as the same outcomes.

AusNet Services suggested that one solution was to underground the powerlines in high risk areas in the same timelines as required for REFCLs by the regulations, and not installing a REFCL at that ZSS. The other was to operate the REFCL only on the specific high risk feeders rather than the whole ZSS.

It was said that the risk studies used to demonstrate the appropriate reduction in risk were those conducted by the distributor based on fire loss consequence and other considerations, and not those necessarily used by the government in determining the areas in which ZSSs were to be deployed.

A slide showing network of the Eltham ZSS was displayed showing the “Codified Area”, high risk component of the network. AusNet Services stated that outside that “Codified Area” the bushfire risk was incredibly low.

The solution offered by AusNet Services was to underground all of the powerlines in the high risk area and not install a REFCL. The cost was said to be $2M-$7.5M for undergrounding, compared with $11M for the introduction of a full REFCL solution. A committee member sort confirmation as to whether the solution posed did indeed give the same fire risk reduction outcome and whether the new legislation allowed the adoption of these solutions. AusNet Services took the view that all of the significant risk in that network was in the Codified Area and also that the new legislation did not allow these solutions and required the granting of an exemption.

Powercor confirmed that they also had similar ZSSs and cited an example where only one feeder for an entire ZSS went into a bushfire risk area, yet all feeders were required to be covered by a REFCL. It was further mentioned that it was proposed to build a new ZSS and transfer that feeder to that new ZSS which is not listed in the regulations.

The Chair reflected that the modeling considered the worst fire conditions to identify the areas of highest and higher consequence, and that fires from the electrical network did not necessarily only start in the highest consequence areas. As such there will need to be a careful analysis of the risk circumstances as there are other factors which the Emergency Management Commissioner considers, including access and egress to guide government in determining the areas for special requirements.

Distributors offered to take the committee through their risk modeling as it is not just taken from the Phoenix fire loss consequence modeling and considers other factors.

AusNet Services confirmed that for the “Codified Area” attached to the Eltham ZSS that this area is required by regulation to be undergrounded eventually and what they would seek to do is bring that work forward in lieu of placing a REFCL in the ZSS.

The DoES provided clarity for the members that areas covered by REFCLs include areas the legislation required the insulating/undergrounding of networks over time.

AusNet Services spoke to a slide depicting the Bairnsdale ZSS which showed the high fire risk feeders of that ZSS were to the north, whereas the majority of the ZSS feeders do not pose significant fire risk. AusNet Services suggested that an option they considered was to install a REFCL for the northern feeders and thus not require the hardening and balancing of the whole network. It was said that this would save about a third of the cost for this ZSS.

There was a brief conversation between members regarding the challenge for government's granting exemptions on safety related matters.

The distributors expressed appreciation of members' comments in determining the value or otherwise in proposing alternate propositions.

The Chair advised the observers that the PBSC had identified a need to define the process to provide advice on any request for relief, were the DoES request such advice.

Action: Copy of the presentation to be distributed with the minutes and made available on the ESV PBSCs web page.

Action: Consideration be given to distributors taking the committee through their risk modeling.

4. Meeting practices

4.1. Confidential matters

The Chair requested that the distributors provide advice to him, by email if that is suitable, on which matters if any are likely to be of a confidential nature, understanding that the intent is that the general proceedings of the committee are in the public domain.

The distributors responded that largely the matters that are commercial are those contained in their submissions on price review to the AER and secondly the risks related with their insurance. Hence there is unlikely to be confidential material presented to the committee. Where detailed information is made available it is likely that will be to ESV in the first instance, rather than the PBSC.

5. Legislation

The Chair advised that it was not intended to go through the new legislation at this meeting as legislation stands on its own merits.

Further it was stated that it is not the role of the PBSC to offer advice or interpretation of that legislation.

Distributors were advised to seek their own advice on the new legislation.
The Chair noted that the legislation does not fundamentally change the things that the distributors are doing in response to the requirements contained in the recent bushfire amendment regulations. Rather it applies a penalty for noncompliance and changes how exemptions might be granted.

The Chair suggested that conversations regarding the legislation should be directed to the government, DELWP and as required ESV, adding that most PBSC members found out about the legislation in the same way as the distributors.

The distributors confirmed that they have been talking to the Minister, DELWP and those conversations are continuing.

6. Cross-country faults on a REFCL network

Tony Marxsen provided a brief outline of “cross country faults - what they are and why they are important” in relation to REFCL protected networks. The presentation included how REFCLs work, the theory and what happens when there is a second problem on the network when a REFCL is operating.

There were a number of videos shown of wire on ground testing in 2014 at United Energy’s Frankston ZSS which included, where;

- a fault is applied to a normal network (fire),
- a fault is applied to a network when a REFCL is in service (no fire), and
- a fault is applied to a network when a REFCL is in service with the first bounce not yielding a fire but the second bounce producing a significant fire causing damage to the test equipment as the network had experiences a second fault.

A slide showing the Frankston ZSS and its feeders was displayed identifying the location of the test site and identifying location of an underground cable which failed during the testing when the REFCL was in service.

The situation where a REFCL is in service and managing a faulted powerline and then is exposed to a second fault during that time is called a cross country fault. In these situations the REFCLs ability to stop fire starts is compromised/nullified and in fact the energy released is far higher than in a normal network response.

Tony provided an explanation of how three phase alternating current networks function through the use of vector diagrams. The explanation included how a REFCL functions in displacing the network voltage on a faulted phase, to reduce the initiation of fires, and raises the voltages on the un-faulted phases.

Illustrations were then provided of what happens when a REFCL is displacing the voltage for a faulted phase and another fault occurs on another phase in the network. In this case the REFCL can no longer fully displace the voltage on the original faulted phase and that phase rising as the REFCL attempts to displace the voltage on the next faulted phase. The situation is referred to a cross country fault.

A committee member added that the elevated voltage when the REFCL is operating has the potential to cause fires on surrounding vegetation.

Tony also provided insights into the consequences for the assets on the un-faulted phases of the network exposed to the elevated voltage whilst the REFCL is displacing the voltage on the faulted phase. The conversation included how distributors undertake stress testing to locate assets which are not capable of withstanding those elevated voltages, often referred to as “stress testing”.

The committee member from Orion confirmed that their practice was to apply the stress testing for 20 minutes with weak surge arrestors identifying themselves at about the 17 minute mark. Powercor confirmed that they had adopted a 15 minute stress test and AusNet Services testing associated with their first ZSS has been for a couple of minutes due to other limitations.

In conclusion Tony pointed out that if a cross country fault occurs in a HV customer network the REFCL will behave as if the fault was on part of the distributor's network. So the HV customer issue is important from the point of view of the overall fire risk across the whole network.

The DoES sought and received confirmation from Tony that if a fault occurs on a HV customer network at the same time as a fault on the distributors network it could have the effect of compromising the fire safety performance of the whole network from that ZSS.

It was also discussed the HV customer fault could be as a result of the stress on the HV customer network over time caused by REFCL operation as well as at the time the REFCL managing a particular network fault and elevating the voltage in the HV customer's network.

Action: Copy of the presentation to be distributed with the minutes (size limitations permitting) and made available on the ESV PBSCs web page.

7. New Zealand GFNs

Orion has 22 GFN which they are committed to for their network.

Recent operational experience, performance of the GFNs, safety issues and responses by the manufacturer was provided to the committee.

The details of the experience have been shared with the AusNet Services and Powercor technical personnel. It was said that same GFN behavior had been observed in Australia.

The member asked that the presentation to the committee be kept confidential and distribution restricted to the members only.

Discussion

The Chair commented that the above experience highlights the developmental nature of the introduction of REFCLs, and further commented that Tony's presentation that REFCLs are not a magic device that solves every problem with a low saturation level for network problems.

The Chair then suggested that the members consider this in any advice which the committee is asked to provide.

The Chair advised the Observers of the decision that the first part of the PBSC meeting would be for members only, where committee member matters could be discussed.

7.1. Committee Member raised matters

There were no additional matters raised by members.

7.2. Other matters

There were no matters referred to the committee by ESV for advice.

The Chair thanked the presenters for interesting and informative papers.

8. Meetings

8.1. Next meeting

Meeting scheduled for 13 June 2017, starting at 9:00am and finish at 12:00 noon, preceded by a “meet and greet” at 8:30 am.

8.2. Subsequent meetings

Confirmation was given that subsequent meetings are scheduled for;

12 September 2017, 12 December 2017.

It was agreed that the dates for the 2018 calendar year would be discussed at the next meeting.

The Chair thanked the presenters for interesting and informative papers and closed the meeting.

Meeting closed at 12:10 pm.

List of Attachments

A. Glossary of acronyms/abbreviations

B. AusNet Services and Powercor presentation progress to date

C. Cross-country faults