2010

Safety Performance Report on Victorian Electricity Distribution Businesses

energysafe VICTORIA

Contents

Executive Summary

Energy Safe Victoria (ESV) is reporting on the safety performance of the Victorian electricity distribution businesses for the first time.

This report assesses how well the five companies (CitiPower, Powercor, Jemena, United Energy and SP AusNet) inspected and maintained powerlines during 2010 to minimise the risk of failure and fire.

As Victoria's Energy Safety Regulator, ESV approves and audits the companies' safety schemes each year and the results of these audits, together with other statistics collected on performance, will now be published annually to enable the community, Parliament and industry to assess how well the electricity distribution businesses are meeting their safety objectives.

This 2010 report details the results of nine separate audits of the distribution businesses and one audit of the transmission business, focussing on key safety indicators and the operation of the new Electricity Safety Management Schemes (ESMS). These schemes, which became a mandatory requirement on the electricity distribution businesses in 2010, enable ESV to take stronger regulatory oversight of the design, construction, operation, maintenance and decommissioning of the electricity supply networks.

In addition, amendments to the Electricity Bushfire Mitigation Regulations for the training and performance of electricity asset inspectors and the inspection of electricity lines in Hazardous Bushfire Risk areas (HBRA), and changes to Electric Line Clearance Regulations for vegetation management have imposed new requirements on the electricity distribution businesses.

All these initiatives have contributed to making Victoria's electricity system more reliable and safer for the community, and underpin the more robust regulatory regime that has been put in place following the tragedy of the Black Saturday bushfires in 2009.

For the most part ESV was satisfied that there was a good standard of inspection and timely repair by the industry but performance was mixed across the five distribution businesses.

All companies reported issues relating to vegetation management and clearance from powerlines, but this was mainly due to other organisations, property owners and municipal councils failing to adequately meet their responsibilities.

ESV noted that there were a number of improvements and initiatives that were, and continue to be made by the businesses. However, they would all benefit from better aligning their technical standards with their asset management practices in the field and expanding the scope of their asset inspection manuals to capture all asset classes as well as the new requirements contained in revised legislation. In the case of SP AusNet, ESV formed the view that there was an opportunity to improve their understanding and recording of the state of assets in their systems.

In 2010, ESV is reporting data that provides some measure of the safety performance of the individual distribution businesses and the industry as a whole. These indicators measure:

- The number of fires started by the distribution assets in high bushfire risk areas.
- The extent to which the distribution businesses managed their powerline maintenance to prevent failures, particularly in bushfire-prone areas.
- The extent to which safety was impacted by persons infringing the 'No Go Zone' limits or gaining unauthorised access to the distribution assets.
- The number of electric shocks attributable to the electricity distribution assets.

The distribution businesses have provided data from their internal systems to enable some key indicators to be published for this first report. As a result, ESV recognises that it is not possible to draw direct comparisons, as the basis for collection by individual distribution businesses has not been the same. As such, this 2010 data can only provide a general indication of industry performance.

It shows, however, that fire starts are down and very small failure rates in the networks relative to the size of the system, which includes more than 1 million poles and over 150,000 kms of electric lines.

Following the approval of the ESMSs, ESV has worked closely with the businesses to agree on a standardised set of statistical indicators that will enable a clearer picture of industry performance to emerge over time. Appendix A describes a number of these indicators that will be collected to enable the reporting of performance trends, both for the individual businesses and the overall industry.

In its final report, the 2009 Victorian Bushfires Royal Commission found that the "number of fire starts involving electricity assets remains unacceptably high – at more than 200 a year." In 2010, the distributors reported 137 fires that were started by their electricity assets. While none of these fires were reported as major fires, ESV is alert to the findings of the Royal Commission and the potential for all fires to become catastrophic in extreme weather conditions. A number of initiatives arising from the increased regulatory powers have been put in place to reduce the potential for fires in high bushfire risk areas. These initiatives are discussed in chapters 2 and 3 of this report.

The Powerline Bushfire Safety Taskforce is progressing recommendations from the Royal Commission on the undergrounding of powerlines and automatic reclose functions and will report to the Victorian Government before 30 September 2011. The outcomes of these deliberations will also impact ESV's regulatory approach and the reporting requirements on the distribution businesses. ESV will work with the businesses to implement these new requirements as they develop.

ESV is investing considerably in the implementation of new and enhanced systems with greater capability for capture and analysis of data. Over the next 12 to 18 months there will be a progressive strengthening of ESV's ability to identify trends and emerging issues, and to engage with industry to find solutions to safety issues. Future reports will expand the indicators as well as reporting on key safety events that arose during the reporting period.

ESV is also recruiting additional specialist engineers to increase its capability to monitor the implementation of the new ESMSs, and to work with the distribution businesses to find new, more effective ways to deliver improved electricity safety.

Paul Fearon
Director Energy Safety

1 Introduction

Purpose of this report

Energy Safe Victoria (ESV) was created on 10 August 2005 with the passing of the *Energy Safe Victoria Act 2005.* With the community, the energy industry and other regulators, ESV is committed to the safe and efficient supply and use of electricity and gas. Our role and functions are broad, and our overall responsibility is for the safety and technical regulation of electricity, gas and pipelines in Victoria. ESV reports annually to the Victorian Parliament on the many functions and programs that it administers.

This is the first year that ESV has separately reported on the safety performance of the Victorian electricity distribution businesses to enhance our wider reporting role. ESV intends to provide more information to the community, the Parliament and the industry generally on how well these businesses are meeting their safety objectives and our role in regulating the safety of electricity supply in Victoria.

This 2010 report focuses on key safety indicators reported by the distribution businesses and the operation of the new Electricity Safety Management Schemes (ESMSs). ESV also comments on the implications of the 2009 Victorian Bushfires Royal Commission for ESV and our work arising from the Commission's recommendations. ESV also reports on the audits undertaken, including those to assess the readiness of the distribution businesses for the bushfire season.

Future reports will expand the indicators as well as reporting on key safety events that arose during the reporting period.

How will distribution business performance be reported?

Although generally similar in engineering terms, Victoria's distribution businesses have very different characteristics such as geography, customer base and operating environments that can affect their safety performance. Powercor and SP AusNet both have substantial regional rural distribution networks, with Powercor in particular having considerably more line length than other networks. Jemena and United Energy have mostly urban and semi-urban distribution networks, while CitiPower services the central business district (CBD) as well as nearby urban areas. Approximately 37 per cent of the CBD network is underground.

Table 1 below and Appendix B provide more detail on the diversity of the Victorian networks.

Table 1 Characteristics of distribution networks

Distribution Business	Approximate number of customers	Area	Approximate power line length (km)	Approximate number of poles
CitiPower	305,000	150 km² -CBD, docklands and inner city	6,500	60,000
Jemena	303,000	1000km² – city and north-west suburbs	6,000	85,000
Powercor	700,000	150,000km² – Docklands precinct, extends from Williamstown, north to the Murray, west to the SA border and south to the coast	84,000	520,000
SP AusNet	610,000	80, 000km² – outer-eastern suburbs, north and east to the NSW border, south and east to the coast, and surrounding high country	48,000	315,000
United Energy	620,000	1,500km² – south-eastern suburbs, southwards down from the Nepean peninsula	12,700	205,000

Sources: 2006 Call Centre Final Report, Essential Services Commission, Victoria, October 2006; State of the Energy Market, Australian Energy Regulator, 2010

Consequently, these annual performance reports will not directly compare the safety performance of the businesses with each other, but the outcomes for individual businesses will be highlighted where appropriate. In future years, commentary will be provided on the performance of each business, relative to its performance in prior years.

The primary objectives in reporting the safety performance of the businesses are:

- To monitor the safety performance trends over time for any one distribution business.
- To identify potential systemic issues in the industry or individual distributors for follow-up by ESV or other regulators.
- To inform the community, Parliament and industry about ESV's activity in performing its regulatory role.
- To provide some transparency on how the industry is performing.

What information is reported and published?

The mandated ESMS regime that is described further in Chapter 2 was introduced in December 2009. This regime has provided ESV with increased powers to expand the distribution businesses' reporting requirements. ESV conducted a series of workshops in the latter part of 2010 to develop, with industry, standard data definitions and a vastly improved reporting framework. These indicators, which are published in Appendix A, are designed to provide insights into the effectiveness of the ESMS regime in improving network safety performance, reducing risks due to asset failure and effectively managing the consequences of failures that do occur.

These more comprehensive indicators are not available for this 2010 reporting period. Nevertheless, the distribution businesses have provided relevant data from their internal systems to enable some key indicators to be published in this report. Future reports will be

based on the more comprehensive indicators collected by the businesses, and will be audited through our ESMS audit program.

How this report is structured

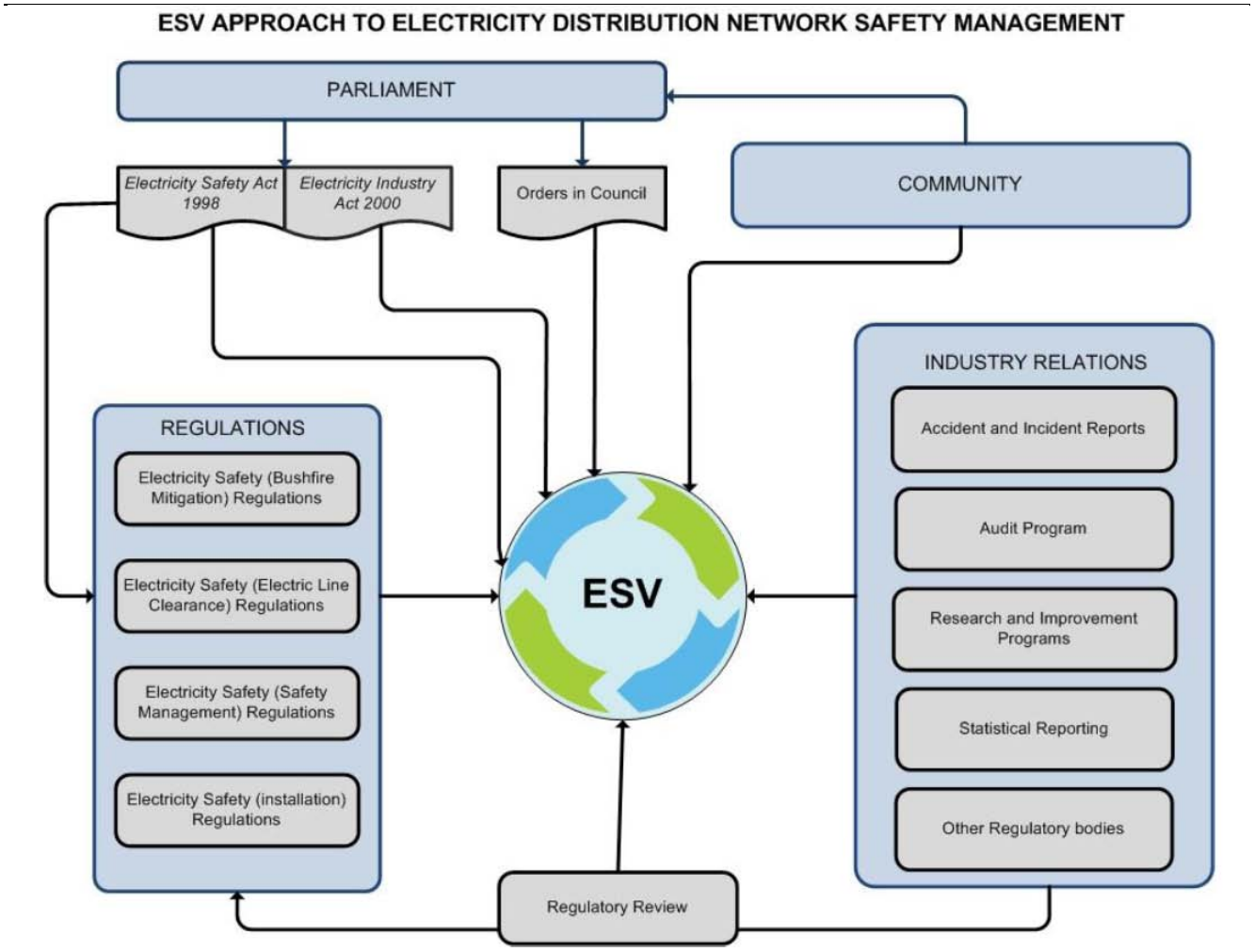
The remainder of this report provides the following information:

- Chapter 2 outlines the safety regulations that apply to the Victorian electricity distributors, including the newly mandated ESMSs, and how ESV monitors compliance with these requirements.
- Chapter 3 discusses the recommendations of the 2009 Victorian Bushfires Royal Commission and actions taken by ESV.
- Chapter 4 sets out the summary findings of the 2010 bushfire mitigation plans and audits.
- Chapter 5 comments on the key safety indicators reported by the distribution businesses for 2010 and the framework for future reporting.

2 How network safety is regulated

The diagram below shows ESV's regulatory approach to distribution network safety management. Each area is briefly discussed in this chapter.

Figure 1



What safety standards apply to the electricity distribution businesses?

The safety of the Victorian electricity networks is governed by the *Electricity Safety Act 1998* and relevant regulations, under which the businesses must adhere to the following requirements:

- Compliance with the Electricity Safety (Management) Regulations 2009, which set out the requirements that the distribution businesses must meet before their ESMSs will be approved by ESV, including compliance with their ESMS once approved.
- Preparation of a Bushfire Mitigation Plan (BMP) for approval and audit by ESV.

- Submission of an Electric Line Clearance Plan (ELCP) for assessment and audit by ESV. Electric line clearance responsibilities are shared between the electricity companies, local municipal councils, persons responsible for the management of public land, owners or operators of electric lines, the Roads Corporation, and occupiers of land containing a private electric line. The electricity distributors' plans generally cover the regional and rural areas, with local councils being responsible for preparing ELCPs annually for the urban areas for which they are responsible. These plans are also audited by ESV.
- Electricity Safety (Installation) Regulations that specify the safety requirements relating to electrical installations and electrical work and certain requirements for electricity suppliers.

The Electricity Safety Management Schemes

A key initiative in late 2009 was the mandating of the Electricity Safety Management Schemes (ESMS). Until this time, the electricity businesses could choose to implement ESMS as an alternative to compliance with the Electricity Safety (Network Assets) Regulations 1999 if they could demonstrate that the safety outcomes were equivalent or superior to those required by the regulations. Whilst most distribution businesses submitted ESMSs under the previous regulations, these schemes did not cover all aspects of the distribution business' activities, for example comprehensive asset management plans.

ESV concurred with the industry, and other relevant regulators that, rather than prescriptive regulation, the safety of the rapidly changing electricity distribution industry would be better achieved through a safety management scheme. This outcomes-based regulatory approach also accords with the general approach taken by the Victorian Government in its regulatory reforms[1] and international best practice.

The ESMS has the following features:

- An ability to develop and implement new technology expeditiously.
- An ability to change and adapt quickly to changing community expectations.
- A mechanism for the safety regulator to closely monitor performance.
- Provisions for the safety regulator to influence the safety related decision-making of the industry.
- Ability for ESV to determine the content of an ESMS as a last resort.
- Penalties for non-compliance.

The regulation underpinning these schemes is wide-ranging and impacts all operations of the electricity businesses. Consequently, these schemes represent the beginning of a new and different relationship between ESV and the distribution businesses.

Through the oversight of these schemes, ESV will be well-placed to test, challenge and expose the performance of the distribution businesses whose principal objective and role is to understand and manage the safety risks, including that of bushfires, in designing, building maintaining and operating electricity distribution networks.

[1] Department of Treasury and Finance, Melbourne, Victorian Guide to Regulation, May 2011

The ESMS must be resubmitted every five years, but may be revised at any time subject to approval by ESV. Legislation also provides for ESV to impose requirements on distribution businesses through their ESMS. The distribution businesses have a statutory obligation to comply with an approved scheme. In turn, ESV will discharge its duty to ensure that the distribution businesses are complying through a comprehensive program of compliance audits.

How does ESV monitor compliance with safety standards?

ESV monitors the performance of the businesses, including compliance with the regulations and their individual ESMSs, through its auditing program, the collection and analysis of incident data, and through collecting, reviewing and reporting key performance indicators.

Enhanced Auditing program

ESV has traditionally relied upon an audit program of distribution business' Bushfire Mitigation Plans and Electric Line Clearance Plans, which were submitted and reviewed annually. In addition special purpose audits were also conducted from time to time.

The intent of this audit program was to form both a view as to the extent of the adoption and the quality of the distributor's policies and procedures that are contained in their plans submitted to ESV. ESV is also informed by data collected since previous audits and the initiatives applied by distributors to the management of their electrical assets. ESV conducts both desktop audits to confirm that approved policies and procedures have been adopted and field audits to demonstrate the deployment of those policies and procedures. Each year the desktop audit revisits a core set of elements and a number of differing matters. The field audits are, by their nature, a limited sample taken at a point in time and are not designed to inspect all of the distributor's individual assets. Assets selected for study during the field audit are often those that are seen at the audit to be at or below the business' intended standard. This does not automatically imply imminent asset failure nor does it imply a rate of inspection failure for the whole population of assets. The field audit's principal purpose is to assess the efficacy of a distributor's asset inspection and maintenance systems, and for this reason the sample chosen is not a random or statistically significant sample. Notwithstanding, ESV can and does form a general view as to the state of a distributor's assets and the quality of maintenance and management, which is communicated to the individual businesses at the completion of the audit.

Commencing in 2011, ESMS audits will be conducted quarterly, focussing on different elements of the approved scheme on each occasion. In this way, it is expected that all of the fundamental elements of the distributor's scheme will be audited during its five-year life.

Key performance indicators

With the commencement of the Electricity Safety (Management) Regulations 2009, ESV published its amended *Distribution Business Electrical Safety Performance Reporting Guide*. This guide sets out both those serious electrical incidents that must be notified to ESV within certain timeframes as well as the suite of key performance indicators that are to be reported by the electricity distributors quarterly.

These new indicators will provide ESV with the capacity to monitor the performance and compliance of the distribution businesses with their approved schemes, to identify trends and to track changes over time. The indicators, which will be publicly reported in the annual safety performance reports in future years, are set out in Appendix A.

Distribution Price Reviews

The Australian Energy Regulator (AER) reviews each distributor's five-yearly submission under the Electricity Distribution Price Review which sets prices that the distributors may charge for their monopoly services. For the 2010 review, the AER requested that ESV review the safety-related initiatives of the distributors, and provide advice to it about the expected safety improvements from those initiatives.

Following approval by the AER of the price reviews, ESV introduced mandatory reporting of the distributors' progress in implementing their approved programs to ensure that they are progressing in accordance with expectations. This will inform the AER's future distribution price determinations.

3 Impact of 2009 Victorian Bushfires

How did the 2009 Victorian Bushfires Royal Commission affect ESV's role?

The Victorian Bushfires Royal Commission, in its Final Report Summary, was:

> '...strongly of the view that Energy Safe Victoria's regulatory powers and resources need to be strengthened, including the organisation's ability to apply sanctions for non-performance. It proposes that Energy Safe Victoria have a clear mandate to prevent and mitigate electricity-caused bushfires and powers to fulfil that mandate.'[2]

The Victorian Government had already committed to a number of initiatives, including legislative change – some of which were identified prior to the devastating 'Black Saturday' bushfires of 7 February 2009. It also foreshadowed greater funding that would put ESV in a stronger position to play its part in increasing overall community safety.

The Royal Commission's report strengthened the response by the Government, which introduced amendments to the *Electricity Safety Act 1998* and the *Energy Safe Victoria Act 2005.* The amendments to the Electricity Safety Act significantly strengthened the bushfire mitigation regime and now require the electricity businesses and other persons operating similar above ground electricity lines in high bushfire risk areas to:

- Minimise bushfire risks.
- Not operate those lines between 1 November and 31 March unless in accordance with a Bushfire Mitigation Plan that has been accepted by ESV.

Other impacts on ESV's regulatory role have been to:

- Require ESV to approve the training courses for electricity asset inspectors.
- Clarify its powers in respect of audits of the distribution businesses.
- Extend its powers to enable it to direct that vegetation be removed or to stop the planting of unsuitable vegetation under or near powerlines.

Overall, ESV has an enhanced ability to assess, monitor and enforce compliance with the electricity distributors' Electricity Safety Management Schemes and Bushfire Mitigation Plans.

Key technical recommendations and what ESV has done

The Victorian Bushfires Royal Commission made a number of specific recommendations directly impacting the electricity distributors and ESV's regulatory role. There were four recommendations (28, 29, 30 and 33) that were specific to ESV's current role and these are addressed below. The detailed recommendations are set out in Appendix C.

[2] Final Report Summary, 2009 Victorian Bushfires Royal Commission, July 2010, p12

Asset inspection standards

The Electricity Safety (Bushfire Mitigation) Regulations 2003 were amended on 21 October 2010 to require the distribution businesses to:

- Inspect, at least every 37 months, all overhead electric lines in Hazardous Bushfire Risk areas, and
- ensure that only properly trained asset inspectors are employed in the inspection of overhead electric lines in Hazardous Bushfire Risk areas.

ESV has required these minimum standards to be included in the distribution businesses' Bushfire Mitigation Plans. The distributors in conjunction with Registered Training Organisation and ESV have developed a Certificate II in Electrical Asset Inspection that has been approved by Skills Victoria. In its approval of the training framework ESV has both specified the subjects to be completed as well as approving the training provider suitable to deliver the course.

Risks posed by trees close to powerlines

Revised Electricity Safety (Electric Line Clearance) Regulations 2010 came into operation on 29 June 2010. These amended regulations have clarified the minimum clearance space between trees and powerlines and reinforced requirements of the electricity distribution businesses to assess vegetation and to take action to remove that part of the tree that would pose a hazard to the electric line. ESV has required these minimum standards to be included in the distribution businesses' Electric Line Clearance Plans.

Action to reduce sparking from powerlines

ESV is directing the distribution businesses to take action to minimise wires contacting each other (clashing) to prevent sparking that may cause fire.

The distributors are developing programs to progressively comply with these directions. This will be mandated through the ESMS, with progress monitored quarterly by ESV.

Action to reduce failure of powerlines

ESV is directing the distribution businesses to adopt certain design standards to reduce the fatigue of powerlines through the installation of vibration dampers.

The distributors are developing programs to progressively comply with these directions. This will be mandated through the ESMS, with progress monitored quarterly by ESV.

Powerline Bushfire Safety Taskforce

ESV is working with the distributors, through the Powerline Bushfire Safety Taskforce, to continue efforts to reduce the fire risk of the electricity networks following the report of the Royal Commission.

The Taskforce is specifically addressing how the following recommendations arising from the Royal Commission can be implemented within 10 years.

Recommendation 27

The State amend the Regulations under Victoria's Electricity Safety Act 1998 and otherwise take such steps as may be required to give effect to the following:

- *The progressive replacement of all SWER (single-wire earth return) power lines in Victoria with aerial bundled cable, underground cabling or other technology that delivers greatly reduced bushfire risk. The replacement program should be completed in the areas of highest bushfire risk within 10 years and should continue in areas of lower bushfire risk as the lines reach the end of their engineering lives.*
- *The progressive replacement of all 22-kilovolt distribution feeders with aerial bundled cable, underground cabling or other technology that delivers greatly reduced bushfire risk as the feeders reach the end of their engineering lives. Priority should be given to distribution feeders in the areas of highest bushfire risk.*

Recommendation 32

The State (through Energy Safe Victoria) require distribution businesses to do the following:

- *Disable the reclose function on the automatic circuit reclosers on all SWER lines for the six weeks of greatest risk in every fire season.*
- *Adjust the reclose function on the automatic reclosers on all 22-kilovolt feeders on all total fire ban days to permit only one reclose attempt before lockout.*

The Taskforce is to report by the end of September 2011.

Improved safety outcomes

The findings of the 2009 Victorian Bushfires Royal Commission have resulted in increased regulation of the distribution businesses and ESV taking stronger regulatory oversight of the design, construction, operation, maintenance and decommissioning of electric lines. This is demonstrated by new regulations requiring improved training of electricity asset inspectors, more frequent inspection of the electricity lines in Hazardous Bushfire Risk areas, and increased auditing of high-risk areas. This auditing is particularly targeted to the rural areas served by Powercor and SP AusNet, these being the two networks that contain the most significant fire-prone areas of the state.

ESV will continue to develop and review strategic options to reduce further the risk that electricity assets will start fires during periods of extreme weather.

4 2010 audit outcomes

Bushfire Mitigation Plans and Electric Line Clearance Plans and audits

Electricity distributors are required to prepare, and submit to ESV by 30 June each year, a plan in accordance with the Electricity Safety (Bushfire Mitigation) Regulations in regard to their proposals for the mitigation of bushfire in relation to their overhead electric lines in Hazardous Bushfire Risk Areas (the Bushfire Mitigation Plan). All distributors met this requirement in 2010, and Energy Safe Victoria subsequently approved those plans. Distributors are also required to prepare and submit to ESV each year a plan in accordance with the Electricity Safety (Electric Line Clearance) Regulations for the distributors' proposals for the maintenance of the clearance space around aerial electric lines (the Electric Line Clearance Plan).

The requirement for submission and approval of the Bushfire Mitigation Plans and Electric Line Clearance Plans has been in place for many years and it has been ESV's practice to audit each business' compliance with their plan annually in the pre-summer period.

In 2010, ESV introduced mid-year audits of the most fire-prone areas of SP AusNet and Powercor, in addition to its normal pre-summer audits for compliance with Bushfire Mitigation and Electric Line Clearance Plans.

Mid-year audits – Powercor and SP AusNet

In these 2010 audits, ESV placed particular emphasis on asset management, the condition of assets and on the accuracy of the asset inspection and reporting procedures.

The audit focussed on:

1. An assessment of the business policies, procedures and work program in relation to the inspection and management of both HV & LV Distribution Lines.
2. An assessment of the employment, training and qualifications of Asset Inspectors and their suitability to carry out inspections on the distribution assets.
3. A detailed check of 214 sites taken after surveying 2700 kms of line to maximise the assessment of different Asset Inspectors engaged or employed by the businesses.
4. An assessment of specified assets observed in the field that were deemed to be below standard to determine what level of priority had been allocated and recorded by the businesses in their own systems.
5. A below ground compliance check to determine the soundness of a sample of wooden poles.

It is important to note that the variations reported by the auditor did and do not necessarily imply imminent asset failure. The auditors did not identify any assets that would have justified ESV directing the businesses to immediately fix. As the sample is self-selected and not random, a variation rate cannot be extrapolated across all of the distributor's assets. The audit's principal purpose is to assess the efficacy of a distributor's systems and for this reason the sample chosen is not random but requires the auditor to seek out assets that may contain

specific assets that maybe below standard, to provide ESV with data against which it can assess the efficacy of the business' systems policies and procedures and their adherence to them.

Table 2 shows a summary of the findings.

Table 2 2010 mid-year audits – Powercor and SP AusNet

	Powercor	Sp AusNet
Kilometres travelled (approx)	1500	1200
Sites Audited	101	113
Vegetation Encroachments	0	0
Below Intended Standard or Missing Components	114	155
Items not matched in Maintenance Database	63	112

The auditor formed a view that the reliability of the inspection process appeared to be lower in certain parts of networks where inspection had taken place more than three years ago. This finding supports ESV's and the Bushfire Royal Commission's views that a more frequent (than the existing default five year) inspection cycle is warranted. ESV recognises that following previous ESV audits several distributors, which had initially adopted longer inspection cycles, introduced mid-cycle inspections for particular assets.

The auditor concluded that confidence could be derived from the Powercor inspection regime but that additional asset inspection by SP AusNet was desirable for the coming summer period. As a result, ESV met with SP AusNet to discuss the audit findings. In October SP AusNet committed to undertake the inspection of an additional 30,000 poles with an inspection date greater than three years.

Under regulation, it is now mandated that all aerial electric lines in Hazardous Bushfire Risk areas be inspected at a maximum interval of 37 months, and it is expected that this new regulatory requirement will assist the distributors in the currency of knowledge in condition of their networks.

Following the audits ESV formed a view at the time that there was an opportunity for SP AusNet to improve its performance in regard to its asset inspection and data capture systems and improve its knowledge of the condition of their assets more generally. This was recognised by SP AusNet in the changes it introduced to its inspection processes, procedures and frequency.

At the end of 2010 ESV commenced a further audit on a selected part of SP AusNet's distribution network. This audit was designed to form a more detailed view of the distributor's intended design, construction and maintenance standard as it applied to a specific location and its network more generally. This audit involved giving the distributor advance notice of the assets which would be inspected. The subsequent initial inspection in November 2010 revealed a number of assets which, in the auditor's opinion, were below the business' intended standard. ESV subsequently advised its intention to conduct a further inspection of these assets in late January 2011 which will be a matter included in the 2011 report.

Pre-summer audits

ESV conducted the pre-summer period audit on all five distribution businesses. These audits placed emphasis on the businesses' policies, procedures and practices adopted to mitigate fire ignition as described in their Bushfire Mitigation and Electric Line Clearance plans.

Following the audits, the auditor concluded that United Energy Distribution, Jemena Electricity Networks, Powercor and CitiPower were well-prepared for the coming fire season. There were instances identified in the SP AusNet network area where, in the auditor's opinion, the necessary maintenance had either not been completed, or where the opportunity was not taken to include less urgent, but nevertheless desirable, remedial work. This work was not critical work or that requiring an ESV direction.

A summary of the auditor's conclusions on these businesses was:

CitiPower Ltd

CitiPower's Bushfire Mitigation Management personnel were well-prepared and co-operative during the audit and provided information to demonstrate their bushfire mitigation preparedness for the forthcoming fire season. The main area of concern for CitiPower was the high volume of vegetation within close proximity to powerlines they have within their networks operational area that were the responsibility of other organisations/councils. The network also had substantial contact between vegetation and covered conductors, with property owners responsible for clearance. The company had instigated a program that will progressively address this issue. In the auditor's opinion CitiPower's preparedness for the forthcoming summer period was in line with their Bushfire Mitigation and Vegetation Management Plans.

Table 3 2010 pre-summer audits - Citipower

Km travelled	Sites Audited	Vegetation Encroachments (CitiPower)	Vegetation Encroachment (other parties)	Below Intended Standard or Missing Components	Items not matched in Maintenance Database
160	102	2	83	62	75

Jemena Electricity Networks

Jemena had established a comprehensive and well-presented range of documentation to support bushfire mitigation management with policies, strategies, and procedures to ensure there was a common understanding of the business's direction across personnel involved in maintenance and bushfire mitigation activities. Jemena had significantly improved the standard of network maintenance over the past two years in both the HBRA and fringe areas of LBRA around the Townships of Bulla, Gisborne South, Diggers Rest and Sunbury. Jemena's three year Asset Inspection Cycle provides early detection of asset defects and possible failures and leads to timely planned maintenance programs. In the auditor's opinion Jemena Electricity Network's preparedness for the forthcoming fire season was in line with their Bushfire Mitigation and Vegetation Management Plans.

Table 4 2010 pre-summer audits - Jemena

Km travelled	Sites Audited	Vegetation Encroachments (Jemena)	Vegetation Encroachment (other parties)	Below Intended Standard or Missing Components	Items not matched in Maintenance Database
780	80	0	1	6	4

Powercor Australia Ltd

In the Auditor's opinion Powercor's preparedness for the forthcoming fire season was in line with their Bushfire Mitigation and Vegetation Management Plans. At the date of the audit the business was confident that they had the resources to complete the remaining minor asset replacement items and the vegetation pre-summer cutting/removal. This opinion was supported from observations in the field of the distribution assets as they were reported as in good condition and were well placed to meet the fire season.

Table 5 2010 pre-summer audits - Powercor

Km travelled	Sites Audited	Vegetation Encroachments (Powercor)	Vegetation Encroachment (other parties)	Below Intended Standard or Missing Components	Items not matched in Maintenance Database
1260	100	23	15	61	42

SPI Electricity Pty Ltd (SP AusNet)

SP AusNet had established a comprehensive range of documentation to support the management of their asset inspection program, however the same focus on excellence was not observed in the field with asset inspection. It was noted that a number of SP AusNet's assets which were in years four and five of their inspection cycle were assessed as being below their intended standard. However, the company had commenced mid-cycle aerial inspections which would address this over time.

There was evidence that the pre-summer vegetation clearing work had commenced, but there were sites audited that were not in full compliance with the regulatory requirements at the time of the audit.

Table 6 2010 pre-summer audits – SP AusNet

Km travelled	Sites Audited	Vegetation Encroachments (SP AusNet)	Vegetation Encroachment (other parties)	Below Intended Standard or Missing Components	Items not matched in Maintenance Database
1200	102	18	29	91	82

United Energy Distribution Pty Ltd

United Energy Distribution had established a comprehensive range of documentation to support bushfire mitigation management with policies, strategies, and procedures. United Energy Distribution has carried out considerable work on the network to progressively accomplish a reduction of bushfire risk over the past five years. This had been achieved through the implementation of a series of positive strategies to improve the quality and construction standards across the network.

In the auditor's opinion United Energy Distribution's preparedness for the forthcoming fire season was in line with their Bushfire Mitigation and Vegetation Management Plans.

Table 7 2010 pre-summer audits – United Energy

Km travelled	Sites Audited	Vegetation Encroachments (United Energy)	Vegetation Encroachment (other parties)	Below Intended Standard or Missing Components	Items not matched in Maintenance Database
640	101	15	55	56	79

Future focus

ESV continues to work cooperatively with the distribution businesses to improve the safety of the electricity infrastructure.

During 2010, ESV engaged additional new staff with significant experience in electricity distribution, and will further increase its knowledge and experience base in the coming years. It is ESV's view that this will provide a platform for greater dialogue and an increased ability to engage with industry in a productive and proactive manner that will lead to more effective regulation and achievement of shared safety goals.

Following the expansion of the distributor reporting regime, ESV has achieved greater awareness of the performance of the distribution networks, and will be conducting further research into mitigation of the most prevalent causes of bushfires. Areas of particular interest are:

- Failure of conductors, connections and ties.
- Contact with vegetation.
- Bird and animal faults.
- Pole and crossarm fires.
- Fuse failures (in particular, Expulsion Dropout (High Voltage) Fuses).

It will monitor and report to the AER on the businesses' progress in implementing their approved programs under the 2011-2015 distribution price determination.

A focus of ESV's future review of distributors' plans and ESV's audits will be the bushfire mitigation initiatives adopted by the distributors. ESV will also continue to focus its audits on the inspection of assets, specifically powerlines, to mitigate the risks of bushfires in the summer period.

5 2010 safety indicators

What data is ESV reporting?

In 2010, ESV is reporting data that provides an indication as to the safety performance of individual distribution businesses and the industry as a whole. These indicators measure:

- The number of fires started by the distribution assets in high bushfire risk areas.
- The extent to which the distribution businesses managed their powerline maintenance to prevent fires, particularly in bushfire-prone areas.
- The extent to which community safety was impacted by persons infringing the 'No Go Zone' limits or gaining unauthorised access to the distribution assets.
- The number and severity of electrical incidents attributable to the distribution assets.

Future reports will expand on these indicators and increasingly provide trend analysis on the distribution businesses' safety performance over time.

In this first report, the distribution businesses have provided data from their internal systems to enable some key indicators to be published in this report. ESV recognises that it is not possible to draw definitive conclusions from this 2010 data as the basis for collection by individual distribution businesses has not been the same. As such this 2010 data can only provide a general indication of the distribution businesses' performance. ESV has worked closely with the businesses following the approval of their ESMS to agree on a standardised set of statistical indicators to enable a clearer picture of the performance of the industry to emerge over time. Appendix A describes a number of these indicators that are intended to be collected to enable the reporting of trends in performance, both for the individual businesses and the overall industry.

Fires caused by electricity distribution assets

The causal link between electricity assets and fires is well established. Whether or not the fires grow to major proportions will depend on variable factors such as where and when fires occur, the availability of combustible material and the prevailing weather conditions.

The distribution businesses report the number of fires that were started in their network areas including those in Hazardous Bushfire Risk areas (HBRA). These areas are defined by the Country Fire Authority (CFA), and are generally the rural and semi rural areas of the state.

Table 8 below shows that, in 2010, there were 137 fires started by electricity distribution assets.

Of these, 72 fires started in vegetation in HBRA by electricity distribution assets. These fires generally resulted in small fires that were reported by the distribution businesses or the CFA as being quickly extinguished.

Sixty-five fires were started on distribution poles, sometimes as a result of electricity leakage during periods of light rain or drizzle following a dry period. These fires are often restricted to the electricity network and generally do not cause bushfires.

The data confirms that the networks most exposed to fire risks are the rural networks of SP AusNet and Powercor, because of their prevailing environmental conditions and the length of their distribution powerlines. The other distributors supply less fire-prone areas.

It is understood that the number of fire events in 2010 was lower than normal, due to the wet and cool weather that was experienced in the period.

Table 8 Fires by distribution business

Item	Total	CitiPower	Jemena	Powercor	SP AusNet	UED
Fires started in Vegetation in HBRA	72	0	0	28	35	9
Fires started on Poles	65	4	2	32	14	13

Overhead powerline maintenance

Table 9 provides an indication of the performance of the distribution businesses' powerline assets. It measures the rate of failures and does not in itself indicate the consequence of the failure.

'Conductor' failure records instances where the electric wires themselves, or the connections between them, break and cause sparking. Following the provision data for this item, SP AusNet advised that they had included cable tie failures as well as conductor breakages. More failures were reported by SP AusNet and Powercor network areas and this may be due to the more extensive networks owned by those companies.

Pole failures are where the pole has fallen or is leaning to the point where it is not maintaining the wires in their correct positions. The 23 pole failures reported represents a failure rate of less than .002 percent of the total number of poles, which compares favourably with other regions in Australia.

"Shock due to neutral failures" are reported where the service line to an individual property has failed, often due to long-term deterioration of the service line or its electrical connections. In many of these instances, small electric shocks ('tingles') may be reported by the public often from internal water pipes and/or taps. The distribution companies have programs to replace aging service lines and will report progress to ESV. This progress will be monitored through these annual performance reports.

The 'Bushfire Mitigation Index' is a measure of the maintenance status of the kinds of components most commonly associated with fire ignition, and is expected to be held at zero (0) during the summer fire season. A zero index does not mean that all the identified asset maintenance items have been addressed, rather that none of the items have exceeded the time allocated by the business for the repair. As each distribution business has its own method for calculating the index, it is not possible to compare the indices between the businesses. The Powercor result indicated a low level of uncompleted maintenance, which Powercor explained was due to the extremely wet conditions preventing their service technicians accessing some areas. ESV was satisfied that this did not result in increased fire risk.

Table 9 Powerline failures/maintenance by distribution business

Item	Total	CitiPower	Jemena	Powercor	SP AusNet	UED
Conductor failure	129	2	3	18	103	3
Pole failures	23	0	5	4	8	6
Shocks due to service neutral failures	355	32	23	131	67	102
Bushfire Mitigation Index (days above zero)	70	0	0	70	0	0

Community safety

Table 10 shows the number of incidents where members of the public have come into close proximity to or contact with the distribution assets. Contacts with overhead lines include those involving machinery, such as cranes and excavators, or involve criminal intent, for example theft. These breaches are not generally under the control of the distribution businesses.

Access to electricity substations and switchboards by unauthorised persons can result in serious injury, death, or affect continuity of electricity supply. Distribution businesses take considerable care to ensure that assets are secure to prevent unauthorised entry. The data shows that there is a low, but constant level of incidents recorded, most of which appear to involve criminal intent, such as theft. Certain distribution businesses have applied tracing systems to minimise the extent of the theft of copper materials.

Energy Safety regulations set a 'No Go Zone' clearance that provides a minimum distance around the electrical assets in which a person can work safely and includes items that the person is holding and the machinery the person may be operating.

The 2010 data shows the number of times the 'No Go Zone' clearances were infringed in each distribution area. Such incidents can result in very serious injury or death. Consequently ESV sees the need to reduce even further the rate of 'No Go Zone' infringements and is actively promoting the need to 'Look up and Live' and to 'Dial before you Dig' to alert the community to the dangers of infringing the requirements. All distribution businesses offer advice and, as appropriate, issue permits for work near powerlines where required.

The number of breaches in the SP AusNet and Powercor service areas was high when compared to other areas, which may in part be a feature of the length of the electric lines, and demographics associated with rural activities in these networks. ESV will continue to monitor this performance to determine if other steps need to be taken.

Table 10 Safety incidents involving the public by distribution business

Item	Total	CitiPower	Jemena	Powercor	SP AusNet	UED
No Go Zone Infringements	425	31	5	85	292	12
Unauthorised access	24	5	2	14	3	0

Incidents involving electric shock

The number of incidents that involve electric shock, including those resulting in serious injury or fatality, is one of the most important measures in relation to electrical safety. The safety of the public, including the workers and contractors of the electricity businesses, is of utmost importance.

The measures in Table 11 detail the level of electric shock from the electricity network assets, and include shock from 'No Go Zone' breaches as well as motor vehicle accidents and accidents involving the employees or contractors of the electricity distribution businesses. ESV conducts an intensive investigation into incidents involving serious electric shock, and assists other agencies such as WorkSafe in their investigations. ESV regularly issues 'Safety Alerts' to industry and the community to highlight dangerous situations.

Table 11 Electric Shock from distribution assets by distribution business

Item	Total	CitiPower	Jemena	Powercor	SP AusNet	UED
Electric Shock	21	4	0	11	6	0

A Indicators published in annual safety performance report

The following information will be published annually by ESV. Statistics based on calendar year (January to December)

Item	Reporting requirement
Fire starts in vegetation (grass/trees & shrubs)	Number of fire starts in HBRA in vegetation (All fires due to electrical causes)
Pole and crossarm fires	Number of pole and crossarm fires due to electrical causes
Conductor failure	Number of conductor failures (excluding services and failure due to impact)
Pole failure	Number of pole failures (all poles, i.e. 66kV, HV, LV and P/L – excludes poles struck by vehicle)
Reverse polarity	Number of incidents
HV injections	Number of incidents
No Go Zone Infringements	Number of incidents
Unauthorised access	Number of incidents
Bushfire Mitigation Index	Number of days where BFM Index is above zero during the fire danger period as declared by the Country Fire Authority (relates to previous year's declared fire period)
Fatal injury (electrical causes), MEC workers	Number of incidents (Includes contractors)
Serious injury (electrical causes), MEC workers	Number of incidents (Includes contractors)
Electric shocks from MEC assets	Electric shocks from MEC assets (split into HV & LV)
Shock due to neutral failure	Number of incidents
Progress against specified improvement programs	% completion of total program for each DBs program (see separate section)
Submission of Statutory Plans (BMPs, ELCMPs, etc)	Number of plans submitted on time (commentary by ESV)
Submission of Incident Information	% of Schedule 1 & 2 incident reports on time (commentary by ESV)

B Victorian Electricity Distribution Networks

CitiPower

CitiPower supplies around 305,000 customers (about 85 per cent residential) in a 150 km^2 area of Melbourne's CBD, docklands and inner city. Its network includes 6,500 km of wire on approximately 60,000 poles. About 20 per cent (by length) is classed as 'CBD'; nearly 80 per cent is underground. It has common ownership and a common management structure with Powercor.

Jemena

Jemena supplies electricity to around 303,000 customers (about 88 per cent residential) in a 1,000 km^2 area of Melbourne's city and north-western suburbs, with Tullamarine airport at its approximate centre. It includes around 6,000 km of wire (about 75 per cent through the urban area) on 85,000 poles – although around 15 per cent of the urban network and 60 per cent of the rest is underground.

Powercor

Powercor supplies nearly 700,000 customers (85 per cent residential) in 150,000 km^2 of Victoria. Its network includes part of Melbourne's Docklands precinct, and extends from Williamstown, north to the Murray, west to the South Australian border and south to the coast. Powercor uses around 84,000 km of wire (92 per cent classified as 'rural') on approximately 520,000 poles, and less than two per cent of its length runs underground.

SP AusNet

SP AusNet supplies around 610,000 customers (88 per cent residential) in an 80,000 km^2 area. This extends from the outer-eastern suburbs of Melbourne, north and east to the New South Wales border (encompassing Seymour, Benalla, Wangaratta and Wodonga), south and east to the coast, and surrounding the high country that is not connected to mains power. SP AusNet uses 48,000 km of line (85 per cent rural and 96 per cent above ground) and approximately 315,000 poles.

United Energy

United Energy supplies about 620,000 customers (90 per cent residential) in a 1,500 km^2 area from the south-eastern suburbs, southwards down from the Nepean peninsula. Lines on the network are more than 12,700 km long (25 per cent rural, 80 per cent above ground) on approximately 205,000 poles.

Sources: 2006 Call Centre Final Report, Essential Services Commission, Victoria, October 2006; State of the Energy Market, Australian Energy Regulator, 2010

C Recommendations of the Victorian Bushfires Royal Commission

Electricity-caused fire

Recommendation 28

The State (through Energy Safe Victoria) require distribution businesses to change their asset inspection standards and procedures to require that all SWER lines and all 22-kilovolt feeders in areas of high bushfire risk are inspected at least every three years.

Recommendation 29

The State (through Energy Safe Victoria) require distribution businesses to review and modify their current practices, standards and procedures for the training and auditing of asset inspectors to ensure that registered training organisations provide adequate theoretical and practical training for asset inspectors.

Recommendation 30

The State amend the regulatory framework for electricity safety to require that distribution businesses adopt, as part of their management plans, measures to reduce the risks posed by hazard trees – that is, trees that are outside the clearance zone but that could come into contact with an electric power line having regard to foreseeable local conditions.

Recommendation 33

The State (through Energy Safe Victoria) require distribution businesses to do the following:

Fit spreaders to any lines with a history of clashing or the potential to do so

Fit or retrofit all spans that are more than 300 metres long with vibration dampers as soon as reasonably practicable.