2011

Safety Performance Report on Victorian Electricity Distribution and Transmission Businesses

Report released 31 August, 2012

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Preface

This report represents the second year that Energy Safe Victoria (ESV) has publically reported on major electricity company (MEC) performance. This report for 2011 includes the five distribution businesses (CitiPower, Powercor, Jemena, United Energy and SP AusNet) and, for the first time, the two transmission businesses (SP AusNet and Basslink).

ESV is the independent technical regulator responsible for electricity, gas and pipelines in Victoria. ESV oversees a statutory regime that requires MECs to submit and comply with their Electricity Safety Management Scheme (ESMS), submit bushfire mitigation plans annually for acceptance and electric line clearance management plans annually for approval, and to actively participate in ESV audits to test compliance of their safety systems.

This report forms an integral part of ESV's program to provide transparency around these critical activities and to:

- monitor the safety performance trends over time of each business;
- identify potential systemic issues in the industry or individual business for follow-up by ESV or other regulators;
- inform the community, parliament and industry about ESV's activity in performing its regulatory role;
- report on how the industry is performing; and
- assist in holding the network businesses accountable for delivering on their primary legal accountability to design, maintain and operate their assets to minimise safety risks and to reduce the likelihood of bushfires caused by network assets to as low as reasonably practicable.

The reliability and safety performance of electricity networks, including the propensity for them to start fires, is ultimately a function of how well network assets are designed, maintained and operated. Network assets are by their nature long-life assets – up to 70 years or more – and while some effects from changes to design and maintenance may not become fully evident for many years, annual performance can be dramatically affected by the vagaries of weather and its impact on assets, land and vegetation.

Paul Fearon
Director of Energy Safety
31 August, 2012

Executive summary

In this second public report on the safety performance of Victoria's major electricity companies, ESV has found that in 2011:

- Additional investment is beginning to be made by each distribution business (DB) in line with their revised ESMSs, improving the reliability and reducing the fire risk in their networks. In 2011 the DBs were generally ahead in their targeted investment programs.
- The number of fire starts reduced, reflecting more benign weather conditions and modest improvements in failure rates of conductors and poles compared to 2010.
- Audits conducted enabled ESV to conclude that:
    - ESV directions and recommendations were being implemented in a timely manner to match network businesses' asset management plans and budgets;
    - MECs had prepared for the fire season in line with their bushfire mitigation and electric line clearance management plans;
    - MECs' maintenance databases still need to improve and match the condition of the assets in the field;
    - Minor maintenance items were identified but none constituted an immediate fire risk.
- Overall, the electricity network asset failure rates for both 2010 and 2011 have been relatively small considering the size of the networks. The results are consistent with the performance of networks elsewhere in Australia.
- In other areas of electrical safety, the MECs performed adequately. However, areas for improvement were identified in the processes surrounding No Go Zones, and adherence to critical safety procedures while conducting electrical works.
- Finally, in 2011 ESV published a report into smart meter safety (followed up again in 2012), which concluded that meters were safe and were being installed safely by qualified workers.

This summary addresses the key findings and outcomes from ESV's activities regulating the electricity distribution and transmission industries to improve the safety of all Victorians.

Reducing the risk of electrical assets causing bushfires

As a result of the 2009 Victorian Bushfires Royal Commission, and work subsequently done by the Powerline Bushfire Safety Taskforce, ESV invoked its enhanced powers under the Electricity Safety Act 1998 by directing the MECs to update their ESMS to develop plans to install distribution overhead line hardware to make their systems safer.

These ESV directions to the DBs were multifaceted, requiring them to identify where work needed to be undertaken, specifying the standard of work, and timeframes for the completion of the plans. All of the DBs developed plans that ESV reviewed and accepted. As part of their plans, the DBs developed yearly targets on which they are now required to report quarterly progress. ESV is actively monitoring the implementation of these plans and meets regularly with the DBs to review their progress. All of the DBs were meeting or ahead of their targets for 2011.

During 2011, ESV worked with the DBs and subsequently directed them to develop system protection settings for the minimisation of fire starts. ESV also directed all DBs to amend their Bushfire Mitigation Plans to identify all single wire earth return (SWER) electric line protection devices in the highest fire consequence areas of their supply network to which these settings could be applied, and to apply these protection settings on Code Red or Total Fire Ban days. Where the DBs were unable to apply these settings on specified days, ESV directed them to apply system protection settings for the duration of the worst fire consequence period.

ESV also worked with the DBs to require them to amend and subsequently approve their Bushfire Mitigation Plans to identify all other protection devices on all high voltage lines in the highest fire consequence areas and to apply more sensitive protection settings to these devices on Code Red or Total Fire Ban days.

In early 2012, ESV reviewed several outages occurring on Total Fire Ban days that occurred on feeders in the highest fire consequence areas. The results indicated that on these occasions the revised protection settings had little or only modest impact on system reliability.

In 2011, the MECs included in their plans the requirement to inspect assets in the high bushfire risk area (HBRA) within 37 months, using asset inspectors who had met training requirements specified by ESV. This was a major change from the 2010 plans and ESV held several meetings with the MECs to ensure that the implementation of this change was practical while keeping assets safe for the coming years. SP AusNet met the requirement of an increased asset inspection rate in 2011 by using helicopters to inspect pole top assets. This method to accelerate their inspections resulted in SP AusNet identifying additional assets to be replaced before failure. This reflected in a reducing asset failure rate for that business.

Safety improvement programs

In 2010, the Australian Energy Regulator (AER) provided a determination on the allowable expenditure for DBs for the five-year period between 2011 and 2015. This process, known as the Electricity Distribution Price Review (EDPR), included expenditure on works that the AER classified as safety related. ESV undertook to monitor the volume of work undertaken by the DBs to ensure that the community was getting the safety outcomes that had been funded. A requirement of the revised and approved ESMSs was that DBs report quarterly on the progress of these programs, with ESV measuring them against their targets. ESV will hold the DBs accountable for delivery of the critical elements of the safety related programs and ensure these are met at the end of the five-year regulatory period.

Powercor and CitiPower did not set annual targets for their safety programs but are well underway and generally achieving or ahead in the program to meet their five-year commitments.

United Energy is behind on several of its annual targets but ahead on others and consequently may not meet some of its five-year targets. A number of programs have not commenced but United Energy has advised it will do so further into the five-year cycle. It also advised that its

program is under constant review, and is prioritised on a risk management basis. Revised schedules for the longer lead-time programs were provided to ESV.

Jemena is ahead of its 2011 annual targets for most of its programs. A small number of programs have not yet commenced but it has ESV advised they will be initiated in 2012.

SP AusNet distribution has commenced all of its programs and is ahead of its 2011 targets in a number of cases. Some programs still require initial groundwork to be completed and are behind target at present. SP AusNet reviewed its program and issued to ESV a revised five-year program of works to ensure all targets were met. The new program shows revised annual targets that will accelerate programs currently behind schedule, and ESV will monitor progress against these new targets.

Bushfire mitigation audits

In February 2011, ESV conducted an audit in a high bushfire risk area of SP AusNet's distribution network to determine what actions had been taken to close-out 2009-10 audit recommendations and observations identified by ESV in the same area. The results gave the auditor confidence that the issues had been substantially addressed. The audit found that while there were a number of findings identified, all of the high priority items in the audited area had been completed. ESV will continue to review SP AusNet systems and processes to ensure that this improvement is sustained in future years.

The pre-summer 2011-12 bushfire audits concluded that all the MECs were seen to be prepared for the fire season in line with their plans.

The bushfire mitigation index, which indicated the DBs' bushfire preparedness, showed that all DBs, with the exception of Powercor (and CitiPower), had remained at a zero level for the 2010 and 2011 fire danger periods. ESV understands Powercor had difficulty accessing certain areas and is still unable to repair a line in a flooded area near the Murray River. The number of days where their index remained above zero reflected this. The line did not present a risk of starting a bushfire. CitiPower had some maintenance items remaining in 2011 but its network is in a low bushfire risk area (LBRA) and the chance of fire starts is minimal.

It was identified in 2010 that all MECs had issues maintaining sound and congruent asset database systems. High rates of inconsistencies were being identified between assets in the field and documentation recording their condition in databases. Inconsistencies observed varied in magnitude across the MECs. Of the 485 sites audited in 2010, 54 per cent contained inconsistencies. In 2011, 541 sites were audited and 17 per cent contained inconsistencies. This is a significant reduction from the previous year, however ESV still considers this to be too high and future audits will continue to test for compliance in this area.

Vegetation audits

The management of vegetation was a focus in the pre-summer 2011-12 audits. Overall, the MECs were seen to be continuing to improve on their compliance in electric line clearance

across the HBRA. However, ESV auditors still reported compliance issues with vegetation clearances that were council responsibility, particularly in Melbourne and greater Melbourne areas where the issues relate more to safety and reliability than fire risk.

A number of rural council areas were identified by ESV auditors as having improved their performance in relation to tree clearance in their declared areas. ESV will continue its focus on vegetation management.

Fire starts from electrical assets

Based on three years of data from the DBs, ESV has seen an improving trend in fire starts from electrical assets. The DBs reported 137 fire starts in 2010 while in 2011 they reported 119, which is a 13 per cent improvement. This includes vegetation, pole and crossarm fires. No major fires were reported.

The data needs to be considered in conjunction with two contributing factors. First, the last two years in Victoria have seen considerable rainfall, which typically reduces the number of fire starts, and second, ESV believes the DBs had a greater focus in 2011 on reporting minor fires. The reducing trend of fire starts has been most significant in the SP AusNet distribution area where there has been a reported reduction from 49 in 2010 to 23 in 2011. Powercor has reported an increase in fire starts over the same period but this may be due to the dry grass that was prevalent in the western regions of the state, as reported by the CFA during the fire season. This may have affected Powercor more than the other DBs.

Safety management scheme audits

During 2011, ESV conducted its first audits on the businesses' compulsory electrical ESMS. The topics included two critical ESMS regulatory requirements, access authority systems and emergency preparedness. The audit found that there was broad compliance and constructive management practices across all MECs. Access authority systems were also well managed by all MECs, with some minor non-compliances and improvements identified in the audits. All of the MECs were considered to be well prepared for an emergency. Conversely there were issues seen across most DBs with No Go Zone (NGZ) processes and procedures. ESV is holding regular meetings with the MECs to ensure they address audit findings and close out corrective actions.

Public and worker safety indicators

There were no reported fatalities to MEC workers in 2011. However, there were two fatal incidents where members of the public made contact with powerlines. The first fatality was caused by a person making contact with a conductor that had fallen to the ground after being struck by a tree that fell onto the line. The second fatality was the result of a person infringing upon the NGZ limits of approach. As part of ESV's ongoing role to ensure a safer state,

awareness campaigns are regularly run through various state-based media. An ESV safety alert was issued to industry to help prevent reoccurrence of the NGZ incident.

The number of electric shocks reported in 2011 did not vary significantly from 2010, but the number of significant injuries for MEC workers increased from two to four. The increase to four in 2011 prompted ESV to issue a letter (in 2012) to DB general managers advising of ESV's concerns and reminding the businesses and the individuals of their responsibilities for safety. These incidents were attributable to issues with the MECs' procedures or adherence to the procedures.

Safety reliability indicators

Overall the asset failure rates for both 2010 and 2011 have been relatively small considering the size of the networks, which includes more than 1 million poles and over 150,000 kms of electric lines. The current trend from 2010 to 2011 represents approximately a 10 per cent reduction in the number of reported failures.

The number of service line connection failures in 2011 has significantly reduced compared to 2010. The reduction in failures may have been due to the distribution businesses' targeted service line replacement programs, together with electrical testing being performed with the installation of the new advanced meter infrastructure (AMI) meters. The reduction in the number of failures is most evident in the Powercor, CitiPower, and United Energy areas. SP AusNet and Jemena's reported failures show a very small difference compared to 2010. ESV expects that as the DBs continue to rollout their respective programs, the number of failures will decrease further. Service line connection failures represent a major portion of reported asset failures and ESV subsequently initiated a project in 2012 to investigate the failures to ensure replacement programs remained adequate.

With the exception of SP AusNet and CitiPower, the number of reported conductor failures increased from 2010 to 2011. SP AusNet reported a significant reduction in conductor failures, moving from 103 in 2010 to 65 in 2011. This may have resulted from earlier investment in conductor replacements or improved maintenance activities.

The number of pole failures, which is where the pole has fallen or is leaning to the point where it is not maintaining the wires in their correct positions, declined from 2010 to 2011. It was found that:

- Seventeen pole failures were reported in 2011.
- This is a failure rate of less than 0.002 per cent of the total pole population, and is comparable with other utilities in Australia.

The number of reported HV injections across the DBs showed some reduction from 2010. The main reason was the reduced number of reported HV injections in United Energy's area. The cause of HV injections is mainly outside the control of the DBs so this is not an indicator of performance.

Reverse polarities to customers' sites, which is the reversal of active and neutral wires, are usually caused by human error. While the number of reported incidents is minimal the outcome can be severe. Out of three recorded incidents of reverse polarity in 2011 one occurred in the AMI meter rollout. ESV took immediate action by auditing the field practices of the AMI meter installers and by initiating prosecution action against the installer who caused the reverse polarity.

The safety of advanced metering infrastructure (AMI)

In 2011, ESV conducted a review into the AMI installation program. This review covered numerous aspects of the rollout and included audits into the distribution businesses' systems, procedures, practices, and their compliance with relevant safety acts and regulations, principally the Order-In-Council (OIC) gazetted on 13 August 2009.

The review found that the regulatory regime, training, qualifications, and competency of installers was comprehensively developed and had been unanimously agreed to by all stakeholders including unions, industry and training providers. Apart from one finding, the DBs had followed their management systems to ensure that only installers were employed that possessed the qualifications, experience and training required under the OIC.

There were some weaknesses identified relating to internal reporting of non-compliances to procedures. The review concluded that the public should have confidence that the meters were being installed safely and by qualified and trained people. The audits ESV undertook also placed particular emphasis on the requirements of the amended OIC in relation to qualifications of meter installers and compliance with the procedures of the Victorian Electricity Supply Industry Installation Supply Connection Tests and Procedures manual as referred to in the OIC. The results of these audits were in line with the results of the audit review. The audits identified both areas of compliance and non-compliance, and the results were shared with the DBs who responded to the issues. While a number of non-compliances were identified during the audits, it was recognised that overall the DBs' advanced metering infrastructure rollout was being undertaken in a safe manner.

In 2012, ESV commissioned a further report, *Safety of Advanced Metering Infrastructure in Victoria*. The purpose of the report was to examine the new issues raised early in 2012 around the safety of smart meters. ESV's conclusions are based on research, specific enquiries and investigations and are that meters:

- met all relevant Australian and international design and performance standards;
- have not been exploding or causing fires, and do not pose any different levels of risk than the previous generation electromechanical meters; and
- if smart meters fail, they fail safely.

The two reports can be found at www.esv.vic.gov.au

Glossary

AC	Alternating current
ACR	Automatic circuit reclosers
AER	Australian Energy Regulator
AMI	Advanced metering infrastructure
BMP	Bushfire mitigation plan
BPL	Basslink Pty Ltd
CBD	Central business district
CP	CitiPower
DB	Distribution business
DC	Direct current
EDPR	Electricity Distribution Price Review
ELCMP	Electric Line Clearance Management Plan
ESMS	Electricity Safety Management Scheme
ESV	Energy Safe Victoria
GFN	Ground fault neutraliser
HBRA	High bushfire risk areas
HV	High voltage
kV	kilovolt (1000 volts)
LBRA	Low bushfire risk area
MEC	Major electricity company
OIC	Order in Council
PAL	Powercor Australia Ltd
PBST	Powerline Bushfire Safety Taskforce
REFCL	Rapid earth fault current limiter
SWER	Single wire earth return
UE	United Energy
VBRC	Victorian Bushfire Royal Commission
VESI	Victorian Electricity Supply Industry

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.* 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 second year that ESV has reported on the safety performance of the Victorian electricity distribution businesses (DB) and the first year it has reported on the Victorian electricity transmission businesses. This report will provide broad information to the community, the Parliament, and the electrical industry generally on how well the businesses are meeting their safety objectives, and transparency on our role in regulating the safety of electricity supply in Victoria.

This report focuses on key safety indicators reported by the businesses, ongoing critical safety programs, the progression of directions placed on the DBs to meet the recommendations of the 2009 Victorian Bushfires Royal Commission (VBRC) and the Powerline Bushfire Safety Taskforce (PBST), and the operation of the Electricity Safety Management Schemes (ESMS). ESV also reports on audits undertaken, including those to assess the readiness of the DB for the bushfire season.

How will major electricity companies' performance be reported?

The Victorian distribution and transmission businesses are each referred to in legislation as a major electricity company (MEC) and, although generally similar in engineering terms, are vastly different in other aspects. The DBs have very different characteristics such as geography, customer base and operating environments that can affect their safety performance. For these reasons the DBs cannot be compared directly with each other.

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 97 per cent of the CBD network is underground.

The two Victorian transmission businesses are included for the first time in this report for the 2011 period. SP AusNet covers almost the whole state of Victoria including interconnecting lines to NSW and South Australia, whereas Basslink has a comparatively short transmission link with Tasmania. Due to the distinct differences between these two transmission businesses, as with the DBs, it may not be reasonable to make direct comparisons. Future reporting on the transmission businesses will compare their performance with themselves against previous years.

Table 1 and 2 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	Approximate area	Approximate powerline length (km)	Approximate number of poles
CitiPower	305,000	157 km² - CBD, docklands and inner city	6,500	60,000
Jemena	319,000	950km² – City and north-west suburbs	6,000	92,000
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	529,000
SP AusNet	649,000	80,000km² – Outer-eastern suburbs, north and east to the NSW border, south and east to the coast, and surrounding high country	48,900	373,000
United Energy	620,000	1,500km² – South-eastern suburbs, southwards down from the Nepean peninsula	12,700	205,000

Table 2 Characteristics of transmission networks

Transmission business	Approximate number of customers	Transmission voltages	Approximate powerline length (km)	Approximate number of towers
SP AusNet	-	500kV AC, 330kV AC, 275kV AC, 220kV AC and 66kV AC	6,572	13,000
Basslink	-	500kV AC and 400kV DC	67	142

The annual performance reports do not attempt to compare the safety performance of the MECs with each other. However, the report will highlight the outcomes for individual businesses where appropriate, and provide commentary on the performance of each business relative to its performance in previous years.

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

- to monitor the safety performance trends over time for any one business;
- to identify potential systemic issues in the industry or individual business for follow-up by ESV or other regulators, e.g. service cables and connections (refer to section 5, overhead power line maintenance);
- 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 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 are published in the Distribution Business Electrical Safety Performance Reporting Guide and the Transmission Electrical Safety Performance Reporting Guide[1]. They 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 comprehensive indicators are available for this 2011 reporting period.

As part of the electricity distribution price review (EDPR) process administered by the Australian Energy Regulator, all of the DBs have in place agreed safety programs for the five-year period from 2011 to 2015. The first year of this period and the performance of the DBs progression of these programs are included in this report.

ESV has undertaken extensive auditing of the MECs and the results of these audits are included in this report.

How this report is structured

This report provides the following information:

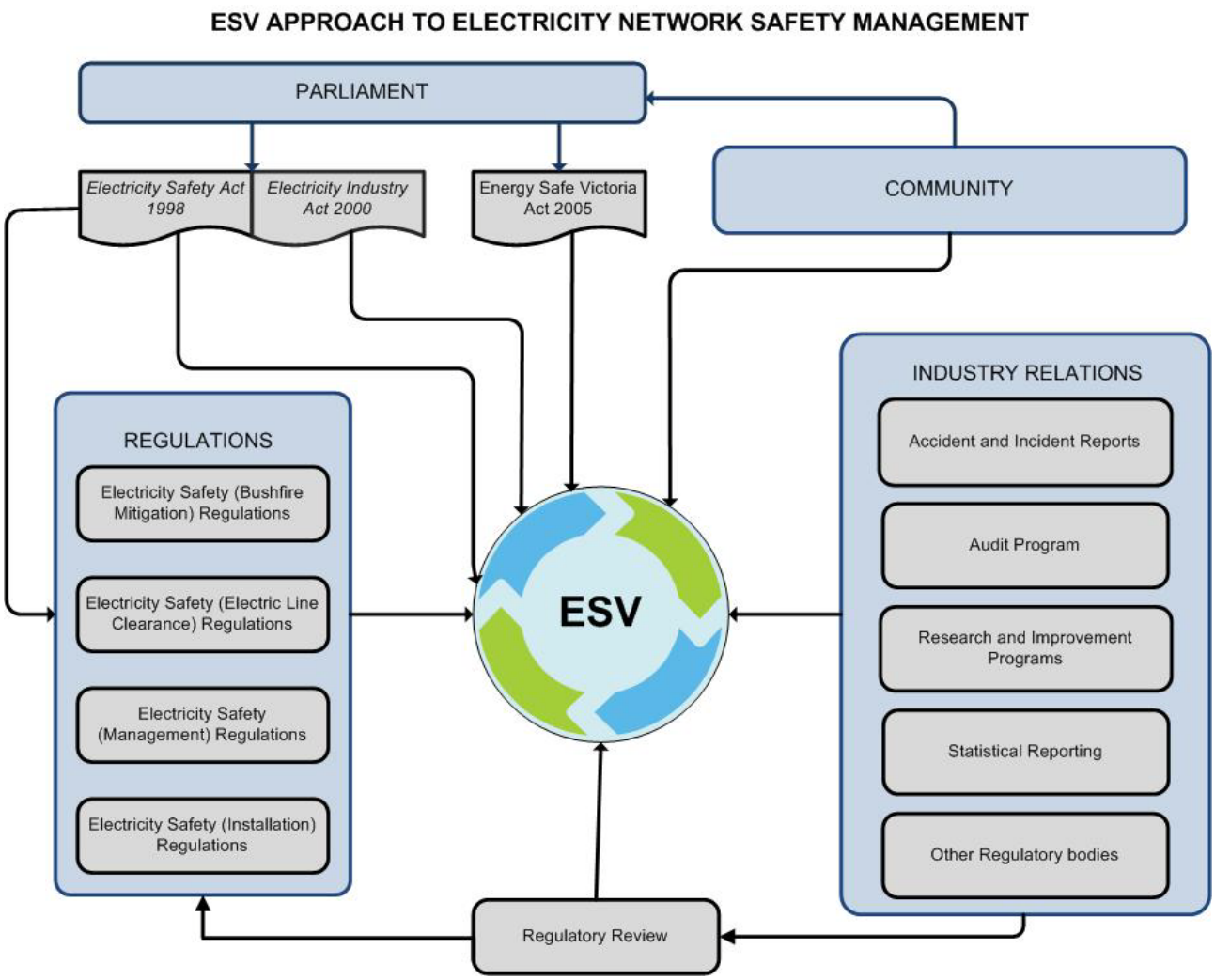
- Chapter 2 outlines the safety regulations that apply to the MECs, including the mandated ESMSs, and how ESV monitors compliance with these requirements;
- Chapter 3 discusses the 2009 VBRC, the PBST and actions taken by ESV to enforce their findings;
- Chapter 4 sets out the summary findings of the 2011 bushfire mitigation audits and the ESMS audits;
- Chapter 5 comments on the key safety indicators reported by the DBs for 2011;
- Chapter 6 discusses key safety incidents and events for 2011.

[1] Reporting guides available on ESV website at http://www.esv.vic.gov.au/Electricity-Professionals/Electricity-Safety-Management-Schemes-ESMS

2 How network safety is regulated

The diagram below shows ESV's regulatory approach to electricity network safety management. The key applicable areas are briefly discussed in this chapter.

Figure 1 ESV's approach to electricity network safety management



What safety standards apply to the major electricity companies?

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:

- *Electricity Safety (Management) Regulations 2009*, which set out the requirements for a Electricity Safety Management Scheme (ESMS) that is required to be submitted by all MECs for acceptance and audit by ESV.
- *Electricity Safety (Bushfire Mitigation) Regulations 2003,* which set out the requirements for a Bushfire Mitigation Plan (BMP) that is required to be submitted by all MECs for acceptance and audit by ESV.
- *Electricity Safety (Electric Lines Clearance) Regulations 2010,* which set out the requirements for an Electric Line Clearance Management Plan (ELCMP) that may be required to be submitted for acceptance and audit by ESV. It is a requirement that all persons responsible for maintaining electric line clearance, including MECs, local municipal councils, persons responsible for the management of public land, owners or operators of electric lines, and the Roads Corporation produce an ELCMP plan annually. It is a requirement that all MECs submit their annual ELCMP for acceptance and audit by ESV. The electricity distributors' plans generally cover the regional and rural areas, with local councils being responsible for preparing annual plans for 'declared' areas, which are areas found in towns and cities. A number of the council plans are audited by ESV each year.
- *Electricity Safety (Installation) Regulations*, which specify the safety requirements relating to electrical installations and electrical work and certain requirements for electricity suppliers.

The Electricity Safety Management Schemes

Some years ago ESV, industry and government concluded that, rather than prescriptive regulation, the safety of the rapidly changing electricity industry would be better achieved through a safety management scheme. This outcomes-based regulatory approach accords with best practice approach taken by the Victorian Government in its regulatory reforms.[2]

A key initiative in late 2009 was mandating of the ESMS. Until this time, the electricity businesses could choose to implement an 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. The *Electricity Safety (Network Assets) Regulations 1999* did not cover all aspects of DB activity, which is now required by the new *Electricity Safety (Management) Regulations 2009*. During 2010 the two transmission companies (SP AusNet and Basslink Pty Ltd) submitted for acceptance an ESMS under the same regulatory regime as the distribution companies. These submissions were

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

assessed and accepted by ESV and resulted in the transmission businesses operating their networks in accordance with an accepted ESMS.

An ESMS includes the following features:

- the requirement for a formal safety assessment;
- the listing of the technical standards adopted by the MEC;
- 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;
- penalties for non-compliance.

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

Through oversight of these schemes, ESV is well placed to test, challenge and expose the safety performance of the MECs whose principal safety objective is to manage electricity network risks relating to bushfires, design, building, maintenance and operations.

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

How does ESV monitor compliance with safety standards?

ESV monitors the performance of each MEC. This includes compliance with the regulations and their individual ESMS, through ESV's auditing program, the collection and analysis of incident data, and through collecting, reviewing and reporting key performance indicators.

Auditing program

The ESV audit program is developed from the accepted ESMS, inclusive of their BMP and ELCMP. ESV takes a risk-based approach to these audits by assessing the relative risks of the various networks, their age, operating environment and prior audit outcomes to decide the areas of focus. ESV is also informed by data collected since the last audit and the initiatives applied by the businesses 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. 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 individual assets.

ESMS audits are regularly conducted, 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 MECs ESMS will be audited during their five-year life. During 2011, ESV audited the MECs on the ESMS elements of:

- access authorities;
- emergency management.

During 2012, ESV is auditing the MECs on the ESMS elements of:

- training and competencies;
- auditing, monitoring and review;
- key performance indicators;
- records.

ESV also audited the local government (council) authorities' compliance against their electric line clearance plans in urban low bushfire risk areas (LBRA) during 2011. A total of 18 audits were completed and, with a few exceptions, a consistently low level of compliance was found. ESV continues to work with councils to improve the level of compliance with the regulations while considering the sensitivity of tree cutting work in these urban areas.

Key performance indicators

With the commencement of the *Electricity Safety (Management) Regulations 2009*, ESV published its amended Distribution Business Electrical Safety Performance Reporting Guide on the ESV website. This guide set 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 quarterly. In 2012 a separate transmission reporting guideline was also published on the ESV website.

These new indicators provide ESV with the capacity to monitor the safety performance and compliance of the MECs to their approved schemes, to identify trends and to track changes over time.

Agreed safety programs

The EDPR process required each DB to submit a case for funding of the businesses for five years to the Australian Energy Regulator (AER). During the 2010 price reset, ESV worked with the DBs and the AER to review the five-year works program and supported the DBs' program of performing extra work to improve the safety of their networks. The outcome of these tripartite negotiations was an agreed increase in expenditure by the AER for certain safety-related works. Each DB submitted a plan to ESV and the AER detailing safety-related volumes of work to be completed by 2015. ESV monitors these works to ensure that the agreed targets are progressively met for the period.

As each DB has different risk profiles, the agreed safety-related works differ for each organisation. However, in general, the agreed safety-related works apply to:

- accelerated rate of change of crossarms, poles, conductor, insulators and high voltage fuses;
- accelerated rate of change of low voltage overhead neutral screen service cables;
- installation of new high voltage protection equipment or upgrading of high voltage protection equipment, e.g. automatic circuit recloses (ACRs) and rapid earth fault current limiters (REFCLs) – also known as a ground fault neutraliser (GFN).

3 Victorian Bushfires Royal Commission and Powerline Bushfire Safety Taskforce

Overview of the 2009 Victorian Bushfires Royal Commission

The 2009 VBRC was established as a result of the bushfires on Black Saturday, 7 February 2009. The Royal Commission's report built on the response by the Victorian 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 MECs and other persons operating similar above-ground high voltage electricity lines in high bushfire risk areas (HBRA) 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 MECs;
- 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 MECs' ESMS and bushfire mitigation plans.

The VBRC also made a number of recommendations as a result of its investigations into the 2009 Victorian bushfires. Recommendations 27 to 34 were made as a result of the bushfires that were caused by electricity assets. These recommendations are listed in Appendix C and the actions taken by ESV on behalf of the government to implement them are detailed below.

The PBST was established in August 2010 to consider how two of the recommendations of the 2009 VBRC, recommendation 27 (powerline replacement), and recommendation 32 (changing the network reclose function) should be implemented. The Victorian Government released in December 2011 the document *The Victorian Government Response to The VBRC Recommendations 27 and 32*, and subsequently through the Department of Primary Industries established a number of working groups to implement its response.

Key technical recommendations and ESV actions

The VBRC made a number of specific recommendations directly impacting the electricity distributors and ESV's regulatory role. ESV has been working with government to implement the recommendations. Implementation of the recommendations 28, 29, 30 and 32 has so far been through Directions placed on the DBs by ESV requiring amendments to their ESMS, or by

submission of and compliance with their current *Electricity Safety (Bushfire Mitigation) Regulations 2003* or the *Electrical Safety (Electric Line Clearance) Regulations 2010*.

Recommendation 27

The replacement of powerlines will receive government funding to be spent over the next 10 years on the lines most likely to cause a bushfire in areas of high consequential loss.

Recommendation 28

Revised legislation has required the DBs to:

- Change the asset inspection regime so that all SWER lines and all high voltage feeders in areas of high bushfire risk area are inspected at least every three years and one month.

All the DBs have complied with this recommendation through their bushfire mitigation plans or have been granted an exemption to allow for a transition period until full compliance can be achieved.

Recommendation 29

Revised legislation has required the MECs to:

- Require asset inspectors to obtain a qualification approved by ESV.

ESV has approved a new training competency qualification for DB asset inspectors.

All of the MECs have complied with this recommendation through their bushfire mitigation plans or have been granted an exemption to allow for a transition period until full compliance can be achieved.

Recommendation 30

Revised legislation has required the MECs to:

- Adopt measures to reduce the risks posed by hazard trees through the DBs' electric line clearance plans.

All of the MECs have complied with this requirement through their electric line clearance plans.

Recommendation 32

a. For the 2011/12 bushfire season ESV directed the DBs to:

- Disable the reclose function on the automatic circuit reclosers on all SWER lines in the worst consequence areas[3] on days of Total Fire Ban or Code Red Days or,

[3] As defined by the Tolhurst model

- Disable the reclose function on the automatic circuit reclosers on all SWER lines in the worst consequence areas for the six weeks of greatest risk during the fire season where it is not practicable to suppress on days of Total Fire Ban or Code Red Days.

b. For the 2011/12 bushfire season ESV directed the DBs to:

- Adjust the reclose function on the automatic circuit reclosers on all 22,000 volt feeders in the worst consequence areas on all Total Fire Ban days to permit only one reclose attempt before lockout.[4]

And negotiated with the DBs to:

- Adjust the reclose function on the automatic circuit reclosers on all 22,000 volt feeders in the worst consequence areas on all Code Red days to inhibit reclose where possible or only one reclose attempt before lockout. [3]

All of the DBs have complied with this requirement, wherever possible, as a result of directions by ESV or by agreement with ESV.

Recommendation 33

a. ESV has directed the DBs to:

- Fit spreaders to all spans of low voltage conductors in hazardous bushfire risk areas.

All of the DBs are complying with this direction.

b. ESV has directed the DBs to:

- Maintain the separation distance between all non-insulated conductors in accordance with the minimum separation required in the national guideline for design of overhead powerlines, 'C(b)1 – Guidelines for Design and Maintenance of Overhead Distribution and Transmission lines'.
- To develop a program to identify spans that do not comply with the required separation distances by 1 February 2011.
- To reconstruct or fit spaces to spans that do not comply required separation distances by:

  I. 1 November 2015 in HBRA

  II. 1 November 2020 in all other areas

All of the DBs have agreed to this direction, developed appropriate programs and have submitted them to ESV.

[4] In some cases the DBs are unable to comply with these requirements due to the type of equipment that is installed

Where the DBs have developed programs they are required to report quarterly on the progress of these programs. ESV monitors and reviews the progress of the programs with the DBs.

c. ESV has directed the DBs to:

- Develop a program to fit armour rods and vibrations dampers to all conductors as specified in the Victorian Electricity Supply Industry (VESI) Overhead Line Manual. These armour rods and vibrations dampers are to be fitted by:

I. 1 November 2015 in HBRA

II. 1 November 2020 in all other areas

All of the DBs are complying with this direction, developed appropriate programs and submitted them to ESV.

Where the DBs have developed programs they are required to report quarterly on the progress of these programs. The government through ESV monitors and reviews the progress of the programs with the DBs.

Victorian Government response to the Powerline Bushfire Safety Taskforce

The Victorian Government responded to the PBST initiatives by publishing in December 2011 *The Victorian Government Response to The VBRC Recommendations 27 and 32*, and subsequently through the Department of Primary Industries (DPI) established a number of working groups to implement the response. The publication details how the government intends to significantly reduce the bushfire risk in Victoria as outlined by the Royal Commission.

The working groups established in 2012 to implement the response to the PBST actions include:

- fire consequence model – to confirm the model and the parameters for both short and long-term application;
- hardship fund initiative – to determine mechanisms to compensate certain persons adversely affected by the implementation of the government's response;
- powerline replacement program;
- research and Development projects.

These projects are being managed by the State Government through the Department of Primary Industries and ESV is continuing to work closely with the working groups.

These projects are additional to those taken to date through the change in legislation and directions issued by ESV.

Risks posed by trees close to powerlines

There are a number of risks posed by trees close to powerlines but the greatest risk is that of fire ignition. On 29 June 2010 revised *Electricity Safety (Electric Line Clearance) Regulations 2010* came into operation. These amended regulations have clarified the minimum clearance space between trees and powerlines and reinforced the requirements of the electricity MECs 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 the MECs through their electric line clearance plans to enforce these minimum clearances.

All of the MECs' electric line clearance plans are submitted to ESV, evaluated and approved before the start of the declared fire season.

Improved safety outcomes

ESV has been very active in implementing the findings of the 2009 VBRC. This has resulted in increased regulation of the MECs 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 (HBRA), increased auditing of high-risk areas and directions placed on the DBs by ESV to comply to recommendations from the VBRC.

The overall number of fire starts caused by DB assets is down 18 per cent from 2010. However, Powercor has seen an increase in the number of fire starts in 2011. This may be due to the high curing rate of dry grass early in 2011 predisposing Powercor's area to fire starts. The CFA conducted a briefing on 27 October 2011 that covered the expected risk and severity of fire conditions. The CFA stated the conditions in Victoria had changed from the last decade and provided similar background conditions to that of Ash Wednesday. It is unknown whether the higher curing rate of dry grass in the western Victorian region will persist in subsequent years.

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

4 2011 audit outcomes

Bushfire mitigation plans and audits

The major electricity companies (MECs) are required to prepare and submit to ESV by 30 June each year a plan for the mitigation of bushfires (i.e. bushfire mitigation plan) in relation to their overhead high voltage electric lines. All MECs met this requirement and ESV reviewed and accepted their plans.

The requirement for submission and acceptance of the bushfire mitigation plans (BMPs) has been in place for many years, as has ESV's practice to audit each business' compliance with their plan annually in the pre-summer period.

The MECs are also required to prepare and submit to ESV by 31 March each year a plan for the clearance of trees (i.e. electric line clearance plan) from overhead electric lines. All MECs met this requirement and ESV subsequently reviewed and approved their plans.

The requirement for the submission of the electric line clearance plans (ELCPs) has also been in place for many years, as has been ESV's practice to audit each business' compliance with their plan annually in the pre-summer period.

Distribution businesses

In February 2011, ESV conducted an audit in a high bushfire risk area of SP AusNet's distribution network to determine what actions had been taken to close out 2009-10 audit recommendations and observations identified by ESV in the same area. The results of the audit are shown in Table 2a.

Table 2a

	SP AusNet
Sites audited	70
Defective / missing asset items	34
Site audited not data compliant	23
Vegetation non-compliant, DB responsibility	1
Vegetation non-compliant, Council responsibility	1

The audit found that while there were a number of findings identified, all of the Priority 1 and Priority 2 items in the audited area had been completed.

ESV conducted the pre-summer period audit on all five DBs. These audits placed emphasis on the policies, procedures and practices adopted to mitigate fire ignition as described in their BMPs and ELCPs.

All of the DBs BMPs and ELCPs were sound documents that were well presented and clear. These two documents formed the basis of each DB's bushfire mitigation activities and were supported by a comprehensive set of mature policies and procedures that were periodically updated to maintain relevance.

Following the audits, the auditor concluded that CitiPower, Jemena, Powercor, SP AusNet and United Energy's preparedness for the forthcoming fire season was in line with their plans.

All personnel involved in the audits were well prepared and cooperative during the audit and provided information that demonstrated their bushfire mitigation preparedness for the forthcoming fire danger period.

Table 3 provides a summary of the 2011 pre-Summer audit results

Table 3 2011 Pre-Summer Audit Results

	CitiPower	Powercor	United Energy	Jemena	SP AusNet
Sites audited	108	108	111	107	107
Defective / missing asset items	N/A	35	26	40	15
Site audited not data compliant	12	26	29	30	1
Vegetation non-compliant, DB responsibility	17	11	13	30	2
Vegetation non-compliant, Council responsibility	87	9	20	2	2

N/A – Not applicable as this audit was confined to vegetation clearance issues.

It is important to note that the issues reported in Table 3 by the auditor do not imply imminent asset failure. Nor can the error rate 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 specific areas were targeted for auditing by ESV. The auditor then made a random selection of assets within the targeted area. The objective is to provide ESV with data against which it can assess the efficacy of the businesses' systems, policies, and procedures and their adherence to them.

The DBs 2011 databases were found to reflect a more accurate representation of the distribution assets than in 2010 with fewer inconsistencies. The significance of the inconsistencies varied in magnitude and their rate when comparing the databases to actuals in the field, had reduced from 54 per cent in 2010 to 17 per cent in 2011, which shows a vast improvement. This figure is still considered to be high and ESV will continue to audit the accuracy of the DBs' asset databases.

The following is a summary of the auditor's conclusions:

Distribution businesses:

CitiPower Ltd

This audit was confined to an audit of the compliance to the requirements of electric line clearance. The concern for CitiPower network operational area was the high volume of vegetation within close proximity to powerlines that was the responsibility of other organisations/councils. This is consistent with 2010 and ESV recommended that CitiPower give consideration to the formation of a management forum with the nine local government municipalities to develop long-term strategies for streetscape vegetation and powerline management programs.

Jemena Electricity Networks (Jemena)

There were no significant concerns within the Jemena area for the then forthcoming fire danger period.

Powercor

In the HBRA the assets were seen to be in good condition and well placed to enter the then forthcoming fire danger period. In the LBRA there were a number of sites that needed to be addressed by the company in their pre-summer work. Powercor operates a five-year inspection cycle in their LBRA.

United Energy

There were no significant concerns within the United Energy area for the then forthcoming fire danger period.

SP AusNet (distribution)

SP AusNet appeared to have significantly improved the standard of asset inspection in comparison to the previous 12 months with only minor differences being detected between the database/inspection reports and the actual assets in the field within the areas covered by the audit.

Transmission businesses:

SP AusNet (transmission)

ESV conducted the pre-summer period audit on the state's electricity transmission network, which carries electricity from power stations to electricity distributors across all of Victoria via approximately 13,000 HV towers and approximately 6,500 km of transmission lines, SP AusNet. This audit placed emphasis on business policies, procedures and practices adopted to mitigate fire ignition as described in their bushfire mitigation and electric line clearance plans.

The audit was a relatively small audit sample of the company's assets and easements and it identified that their database was not a reliable tool for providing an accurate picture of the company's current BFM status. Although work was being done in the field, there was a delay in updating the database. This made it difficult for the company to manage the maintenance of both the assets and vegetation.

Their bushfire mitigation management personnel were seen as well prepared and co-operative during the audit and provided information to demonstrate their bushfire mitigation preparedness for the forthcoming fire danger period.

Following the audits, the auditor concluded that SP AusNet's preparedness for the forthcoming fire season was in line with their bushfire mitigation and electric line clearance plans.

Table 4 provides a summary of the 2011 pre-summer audit results

Table 4 2011 Pre-Summer Audit Results

	SP AusNet
Sites audited	121
Defective / missing asset items	1
Site audited not data compliant	17
Vegetation non-compliant, DB responsibility	4
Vegetation non-compliant, Council responsibility	0

Basslink

ESV did not carry out bushfire mitigation or electric line clearance audits on Basslink during this period due to the small asset base compared with the other MECs.

ESMS Audits

The *Electrical Safety (Management) Regulations* were amended in 2009 to require all MECs within Victoria to operate within the scope of an accepted Electrical Safety Management Scheme (ESMS). All of the Victorian MECs have an accepted ESMS and ESV audits the businesses' compliance to their ESMS. In 2011, all of the MECs were subject to compliance audits to two of the requirements of the *Electrical Safety (Management) Regulations 2009*, **r.**20 Access Authority System and **r.**21 Emergency Preparedness.

Within the MECs, compliance and positive management practices were a common theme and all personnel involved in the ESMS audit process readily responded to requests and assisted to ensure the audit ran smoothly.

Distribution businesses

Table 5 provides a summary of the identified non-compliances:

Table 5 ESMS audit – number of non-compliances, distribution businesses

CitiPower/Powercor	Jemena	United Energy	SP Ausnet
5	2	2	5

Across most of the DBs there was an issue with internal No Go Zone (NGZ) processes and procedures, and how they were applied and complied with.

All of the DBs had incidents in 2011 where No Go Zone infringements occurred. Refer to Table 11 - Safety incidents involving the public by distribution business.

All of the DBs have an access authority system in place although non-compliances and opportunities were found.

All of the DBs are well prepared for an emergency however, again, non-compliances and opportunities for improvement were found.

The following is a summary of the auditor's findings on these businesses:

CitiPower and Powercor Australia Limited

Access authority

The audit found that, in general, processes for managing access authority to the Citipower/Powercor network were detailed and easy to understand. However, the audit did find non-compliances and opportunities for improvement in relation to the implementation of these processes.

The non-compliances related to electrical testing of equipment that was being used in the field and to NGZ in terms of processes and procedures not being followed.

Opportunities for improvement related to various areas and in most cases they were based around improving management practices to reinforce current processes and procedures.

Emergency preparedness

The audit found non-compliances relating to the training of personnel, and opportunities for improvement in relation to the implementation and review of existing processes

Jemena

Access authority

The audit found non-compliances and opportunities for improvement in relation to the implementation of processes.

Non-compliances were found that related to the use of field inspection forms, how the findings from inspections were recorded, and for NGZ there was a non-compliance for a process and procedure not being followed when attending to enquiries received.

Opportunities for improvement related to improving management practices to reinforce current processes and procedures.

Emergency preparedness

The audit found no non-compliances, however there were a number of opportunities for improvement in relation to the implementation of the processes.

The opportunities for improvement that were found were generally in relation to the use of logs and forms referred to in procedures. There was a need to review the process for maintaining records, the format of the records, and the filing system used for the records after an event had occurred.

United Energy

Access Authority

At the time of the audit, United Energy was still in the process of assuming management of its network from Jemena Asset Management, so many of the processes and systems were common to United Energy and Jemena.

The audit found there were non-compliances and opportunities for improvement in relation to the implementation of the processes.

Non-compliances found were based around the use of field inspection forms, how the findings from inspections were recorded and NGZ processes and procedures not being followed.

Opportunities for improvement were mainly related to improving management practices to reinforce current processes and procedures.

Emergency preparedness

The audit found there were a number of opportunities for improvement in United Energy largely due to the transitional situation of the business and subsequently they were in the process of putting in place their own procedures.

In general the opportunities for improvement were for United Energy to continue to develop procedures. ESV was not suggesting that United Energy did not have the processes or had not considered them.

SP AusNet

Access authority

The audit found there were non-compliances and opportunities for improvement in relation to the implementation of their processes.

The non-compliances were based around the process of updating the status in the network environment management system (NEMS) for permit applications and permits to work (PTW) recorded in NEMS.

Opportunities for improvement were based around improving management practices to reinforce current processes and procedures.

Emergency preparedness

The audit found one non-compliance and some opportunities for improvement.

The non-compliance noted was in relation to a level 2 emergency event, which, it appeared, had not been communicated through the SMS communications system. The opportunities for improvement were in relation to the communication of their Crisis and Emergency Management Guide throughout the business, and opportunities that SP should consider.

Transmission businesses

Table 6 provides a summary of the identified non-compliances:

Table 6 ESMS audit – number of non-compliances, transmission businesses

SP AusNet	Basslink
3	2

A summary of the auditor's findings on these businesses:

SP AusNet (transmission)

Access authority

The audit found that there were opportunities for improvement in relation to implementation of the processes.

The opportunities for improvement were based around improving management practices to reinforce current processes and procedures.

Emergency preparedness

The audit found non-compliances and opportunities for improvement in relation to the implementation of processes and improvements to processes.

The non-compliances were in relation to a review of agreed load shed schedules and how that was represented in DISTCO (SP's load shedding system) and the communication of escalation throughout the business.

The opportunities for improvement were related to communication of the Crisis and Emergency Management Guide throughout the SP business, and possible opportunities that SP needs to consider.

Basslink Pty Ltd (BPL)

Access authority

The audit found there were non-compliances and opportunities for improvement in relation to the implementation of the processes.

Non-compliances were based around the confirmation of authorities for personnel to access the network, and a lack of documented procedures for access by persons not under the control of BPL.

Opportunities for improvement were based around improving management practices to reinforce current processes and procedures.

Emergency preparedness

The audit found there were many opportunities for improvement in relation to the implementation of the processes and further development of the processes.

Advanced metering infrastructure (AMI) review

ESV conducted a review into the AMI installation program[5]. This review, covering numerous aspects of the rollout, was initiated as a result of an investigation into a serious incident reported to ESV. The review included separate audits into the distribution businesses' systems, procedures, practices, and their compliance with relevant safety acts and regulations, principally the Order-In-Council (OIC) gazetted on 13 August 2009. At the time of the review 500,000 advanced meters had been installed.

The review has found that:

- The regulatory regime surrounding the safety requirements for installation of meters together with the training, qualifications and competency of installers was comprehensively developed and subsequently unanimously agreed to by all stakeholders including unions, industry and training providers.
- The specific AMI installation training programs developed and accredited by VRQA (Victorian Registration and Qualification Authority) exceeded the minimum qualification requirements set out in the relevant OIC.
- Apart from one issue, the DBs had and did follow their management systems to ensure that only installers were employed that possess the qualifications, experience and training of installers required under the OIC.
- Even though the regulatory regime did not require installers to be licensed and required qualifications and training that was specific and fit for purpose, in practice the DBs mostly employed licensed electrical workers to install meters.
- In relation to work practices, specifically sub-contracting and concerns about piece work, meters were being installed safely and in accordance with regulations including the requirement to test.

[5] AMI safety report available from ESV website at http://www.esv.vic.gov.au/About-ESV/ESVs-reviews-into-smart-meters

- There were some weaknesses in the reporting of non-compliances to procedures, which may have allowed installers to avoid sanctions under the "two strikes" policy that some DBs invoked.
- It was possible for meters to be installed safely in 10 minutes but the actual time to complete depended significantly on location, access, and a range of other external influences.
- There were differing standards of qualification and experience required by other states to obtain an electrical licence which, under mutual recognition arrangements, were required to be granted a licence in Victoria. Even though this was not directly relevant to the safe installation of meters some aspects of ESV's licensing administration may need to be changed prior to the introduction of the National Occupational Licensing System in 2012 to ensure that a more rigorous "like for like" test is applied. There were only six electricians engaged out of 342 who obtained their licenses from other states – including two from South Australia based on Trade Recognition Australia (TRA) qualifications.

The review concluded that the public should have confidence that the meters were being installed safely and by qualified and trained people.

AMI Audits

ESV undertook audits of all the DBs advanced metering infrastructure rollout programs in 2011.

Particular emphasis was placed on the requirements of the amended OIC in relation to qualifications of meter installers and compliance with the procedures of the Victorian Electricity Supply Industry (VESI) Installation Supply Connection Tests and Procedures manual as referred to in the OIC.

The results of these audits were in line with the results of the audit review. The audits identified areas of compliance and non-compliance, and the results were shared with the DBs who responded to the issues.

While a number of non-compliances were identified during the audits it was recognised that overall, the DBs advanced metering infrastructure rollout was being undertaken in a safe manner.

CitiPower and Powercor

The audit findings showed areas where compliance had been achieved and where compliance with VESI requirements has not been fully achieved.

Non-compliances were in the area of the meter installation and testing. A number of recommendations were also made.

Powercor Network Services responded positively to these issues and undertook to address them.

Jemena and United Energy

The audit findings showed some areas where compliance had been achieved and some where it had not been fully achieved.

Non-compliances were in relation to meter installers holding L Class electrical licences, testing of the installation in compliance with VESI requirements and differing versions of documents in circulation at the same time. A number of recommendations were also made.

Jemena Asset Management responded positively to these issues and undertook to address them.

SP AusNet (distribution)

The audit findings showed some areas where compliance had been achieved and some where it had not been fully achieved.

Non-compliances were in relation to testing of the installation against the VESI requirements. A number of recommendations were also made and SP AusNet responded positively to these issues and undertook to address them.

2012 report - Safety of Advanced Metering Infrastructure in Victoria

Concurrent with the development of this report, another ESV publication was released as a draft for review - *Safety of Advanced Metering Infrastructure in Victoria*. The purpose of this report was to examine the new issues raised early in 2012 around the safety of smart meters. The scope is broadly to:

- investigate and report on the circumstances giving rise to the smart meter failures that have occurred in recent months;
- address the specific concerns and issues raised about the safety of smart meters including the impact of a HV injection;
- consider the merit of the different safety procedures for identifying and replacing metering panels/boards in the AMI rollout;
- consider whether the current regulatory framework provides a robust basis for ensuring that smart meters are designed and manufactured to operate safely and, if they fail, that they do so safely.

ESV believes it is important that the public receives informed and independent information so they can continue to have confidence that smart meters are safe. It is also important for the public to know that if meters fail, they do fail safely. ESV's conclusions are based on research, specific enquiries and investigations that it has undertaken.

ESV's main conclusions in the draft report are:

- when smart meters fail, they fail safely and potentially reduce the risk of personal damage and injury;
- the recently reported meter failures in the northern suburbs are attributable to criminal damage rather than HV injection;
- there is no evidence to suggest that the safety risks associated with smart meters are any greater than older style electronic or electromechanical meters;
- there is no evidence to suggest that smart meters are exploding or causing fires;
- the electricity companies are following Victorian Electricity Supply Industry (VESI) minimum procedures for responding to a HV injection when it occurs, which includes requirements to inspect metering equipment and conduct testing as required;
- the smart meters being installed in Victoria meet current Australian Standards including those related to safety, and those standards are robust and appropriate.

ESV future focus

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

During 2011, 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 MEC reporting regime, ESV has achieved greater awareness of the relative causes of bushfires, and will be conducting further research into mitigation of the most prevalent causes. 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 - EDOs);
- incidents arising from the AMI program.

ESV 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 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 2011 safety indicators

What data is ESV reporting?

ESV is reporting data that provides good indicators into the safety performance of the industry as a whole and for each MEC, mainly by comparing current data with previous year's data. These indicators measure:

- the number of fires started by the MEC assets in HBRAs;
- the extent to which the MECs managed their powerline maintenance to prevent assets failing that may start 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 MEC assets;
- the number and severity of electrical incidents attributable to MEC assets.

Fires caused by electricity distribution and transmission 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 MECs 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 7 on the following page, shows that in 2011 there were 59 reported ground fires started by either electricity distribution asset failures or contact with distribution assets (e.g. animals, vehicle, trees, etc.) and zero started by transmission assets. There were 60 fires that were started in or on distribution poles or crossarms often as a result of electricity leakage during periods of light rain or drizzle following a dry period. These fires were usually restricted to the electricity network as they typically occur during periods of light drizzle due to wetting of contaminants on the insulators. There were a total of 119 fire starts in 2011 compared to 137 in 2010, which is a 13 per cent improvement. The weather condition will have had an influence on these results due to the wet and cool weather that was experienced during the period.

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

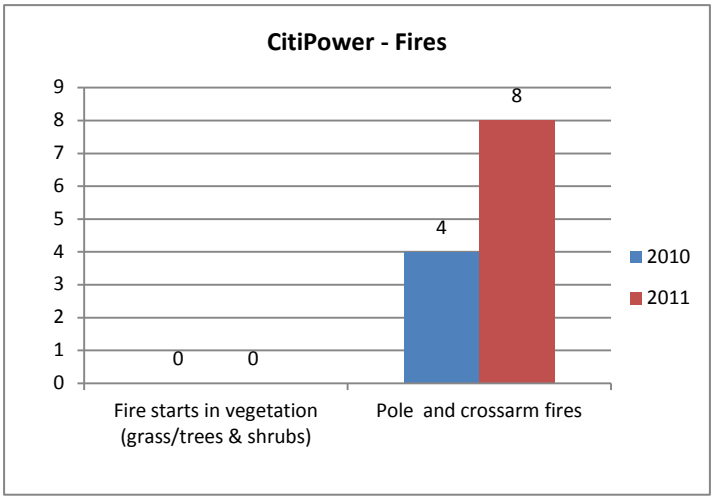
Table 7 Fires by distribution business

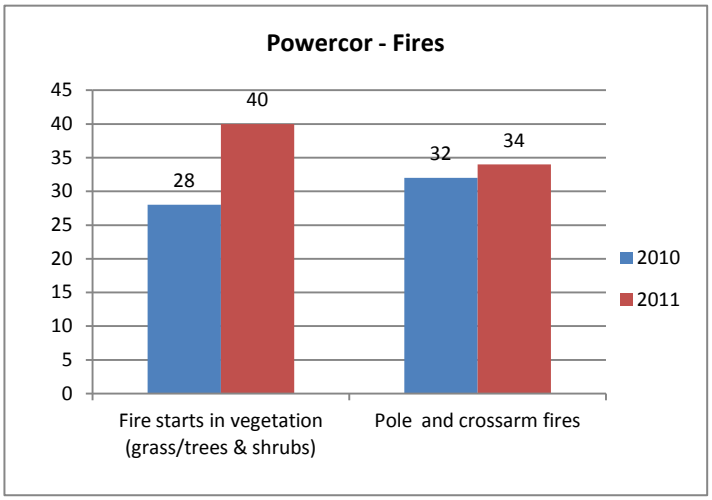
ITEM	TOTAL	CitiPower	Powercor	Jemena	United Energy	SP AusNet
Ground fires (HBRA)	59	0	40	1	2	16
Fires started in poles or crossarms	60	8	34	5	6	7

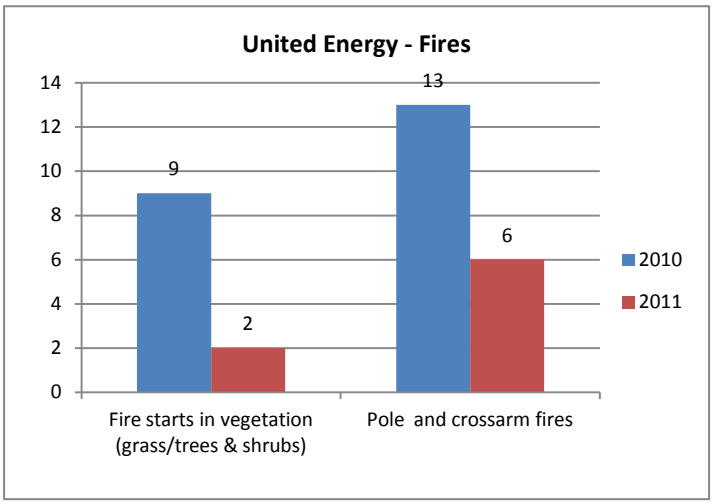
Table 8 Fires by transmission business

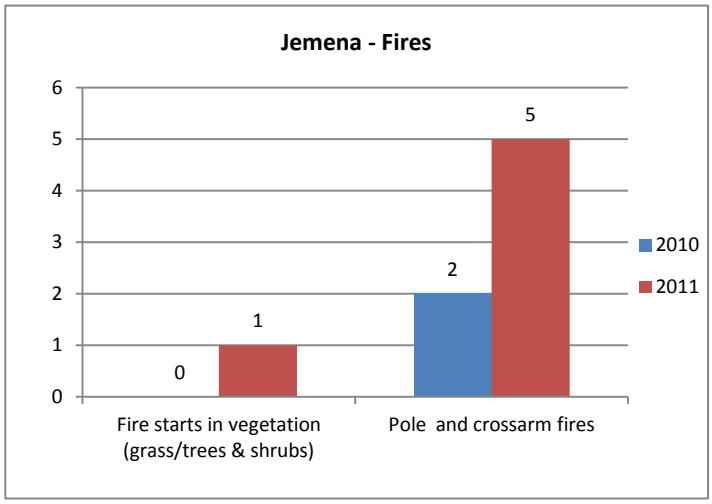
	TOTAL	SP AusNet	Basslink
Fires started in vegetation in HBRA	0	0	0

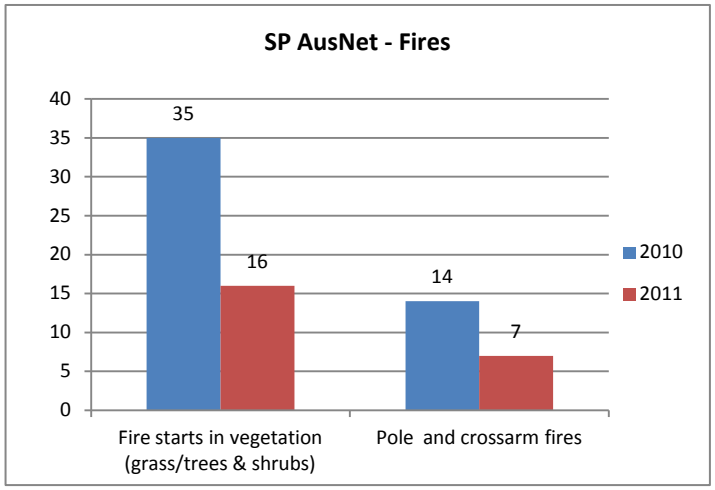
The total number of fire starts have reduced from last year, however it can be seen that Powercor reported a 43 per cent increase in ground fire starts, believed to be mainly due to a greater focus in 2011 on reporting minor fires to ESV. Hence, the 2010 data may have been understated.











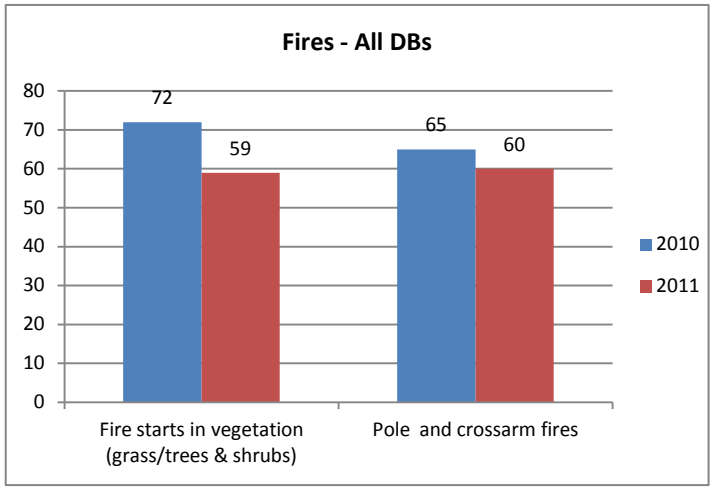


Figure 2 Number of fires by distribution business

Overhead powerline maintenance

Table 9 provides an indication of the extent to which the distribution MECs are maintaining their powerline assets.

Conductor failure is a record of when the electric wires themselves, or the connections between them, break. There were 120 such incidents reported during 2011. Again, due to the larger sizes of the networks, the majority were within the SP AusNet and Powercor network areas.

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 number of failures in 2011 is down from last year with 17 pole failures reported. This represents a failure rate of less than 0.002 per cent of the total pole population, and is comparable with other utilities in Australia.

Neutral service connection failures are reported where the service line to an individual property has failed, usually due to long-term deterioration of the electrical connections. In some of these instances, small electric shocks (tingles) may be reported. The DBs have programs to replace aging service lines and the number of services replaced is reported to ESV. There were 253 service failure shocks reported for 2011 down from 355 in 2010. While this is a significant reduction it is still a high number of shocks.

In 1999 the Office of the Chief Electrical Inspector (OCEI) initiated a program to test all service cables over a 10-year period. This period finished in 2009. The services are again being checked as part of the AMI installation process, which is expected to be completed in 2013.

In 2012 as an outcome of KPI safety performance reporting, ESV has initiated a review of the DB overhead service cables and service cable connections. This review will include:

- risk analysis undertaken;
- inspection policies and procedures (existing NST test program, AMI installation program);
- maintenance policies and procedures;
- prioritisation process;
- programs they have presently in place;
- proposed actions they have identified.

The bushfire mitigation index (BMI) is a measure of the maintenance status for the types of components most commonly associated with fire ignition, and is expected to be held at zero during the summer fire season. As each DB has its own method for calculating the index, it is not possible to compare the indices between the businesses. Table 9 below shows the number of days each DB had an index above 0. Powercor's result is indicative of a low level of uncompleted maintenance that occurred for an extended period. Powercor explained this was mostly due to the extremely wet conditions preventing their service technicians accessing

some areas (at the end of 2011, Powercor's actual index was approximately 4). ESV is satisfied that this did not result in an increased fire risk.

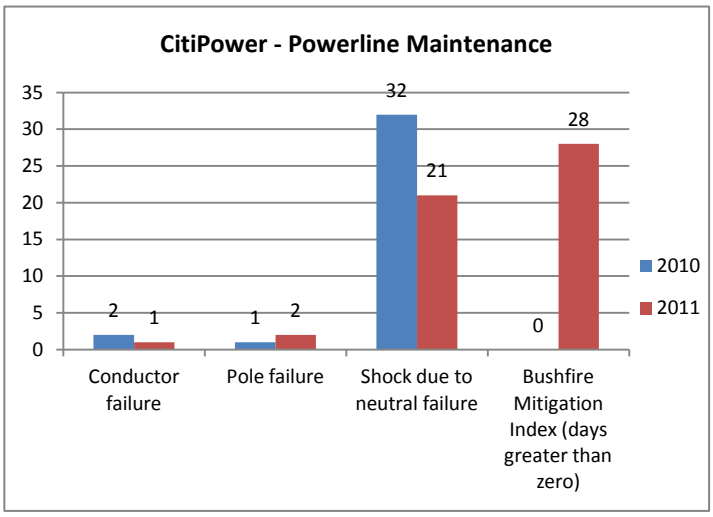
Table 9 Powerline failures by distribution business

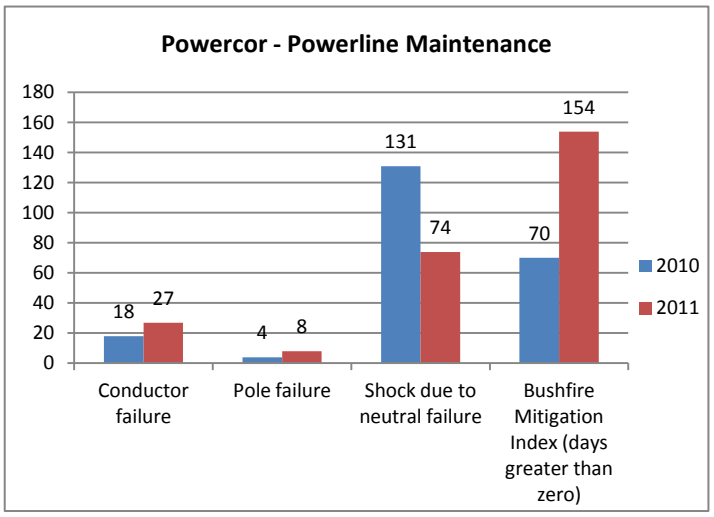
ITEM	TOTAL	Citipower	Powercor	Jemena	United Energy	SP AusNet
Conductor failure	120	0	27	8	20	65
Pole failure	17	2	8	0	1	6
Neutral service connection failure	253	21	74	26	61	71
Bushfire mitigation index	n/a	28	154	0	0	0

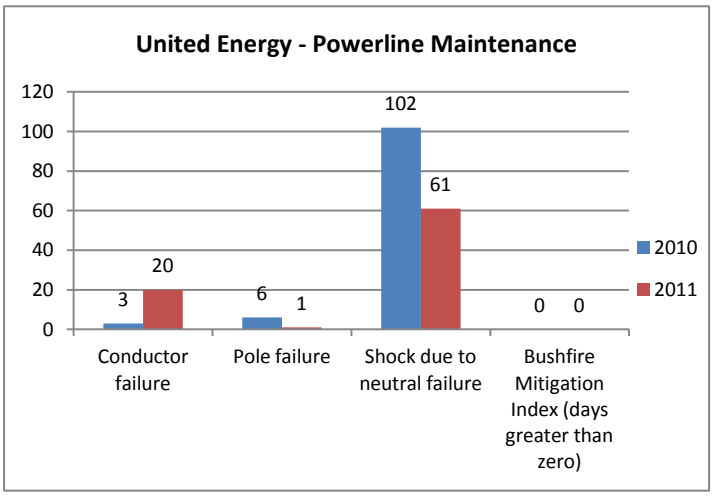
Table 9 provides an indication of the extent to which the transmissions MECs are maintaining their powerline assets.

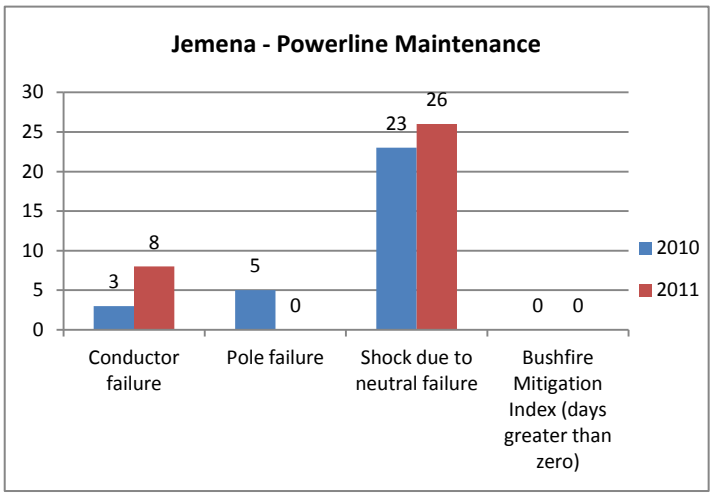
Table 10 Powerline failures by transmission business

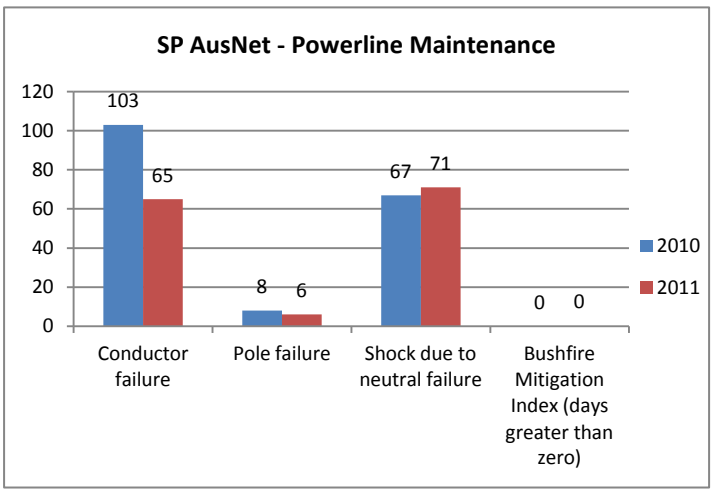
ITEM	TOTAL	SP AusNet	Basslink
Conductor failure	1	1	0
Tower failure	0	0	0











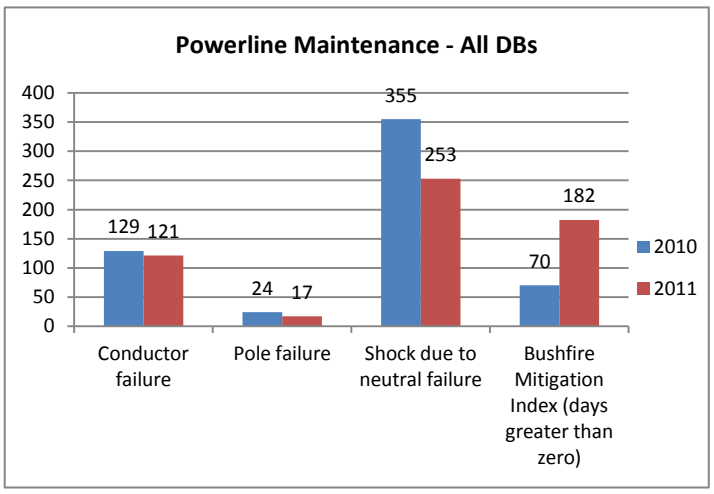


Figure 3 **Powerline maintenance by distribution business**

Community safety

Table 11 and Table 12 show the number of incidents where members of the public have gained unauthorised access to the electricity network assets involving criminal damage, for example theft, or machinery such as cranes and excavators have contacted overhead lines. These breaches are not generally under the control of the MECs.

Access to electricity substations and switchboards by unauthorised persons can result in serious injury, death or affect continuity of electricity supply. To prevent unauthorised entry, the MECs take considerable care to ensure that assets are secure. The data shows that there is a low, but constant level of incidents recorded, most of which appear to involve criminal damage, such as theft.

WorkSafe set a No Go Zone clearance space that provides a minimum distance around the electrical assets that a person can work safely, including an allowance for what the person is holding, and the machinery the person may be operating.

The 2011 data shows the number of occasions the No Go Zone clearances were infringed in each distribution and transmission area. Due to the potential for such incidents to result in very serious injury or death, ESV sought to reduce the rate of No Go Zone infringements by actively promoting 'Look Up and Live' and 'Dial Before You Dig' to alert the community to the dangers of infringing the requirements. All MECs offer advice and issue permits for work near powerlines where required.

A reverse polarity occurs when the active and neutral cables are swapped and this can lead to a serious injury or fatality.

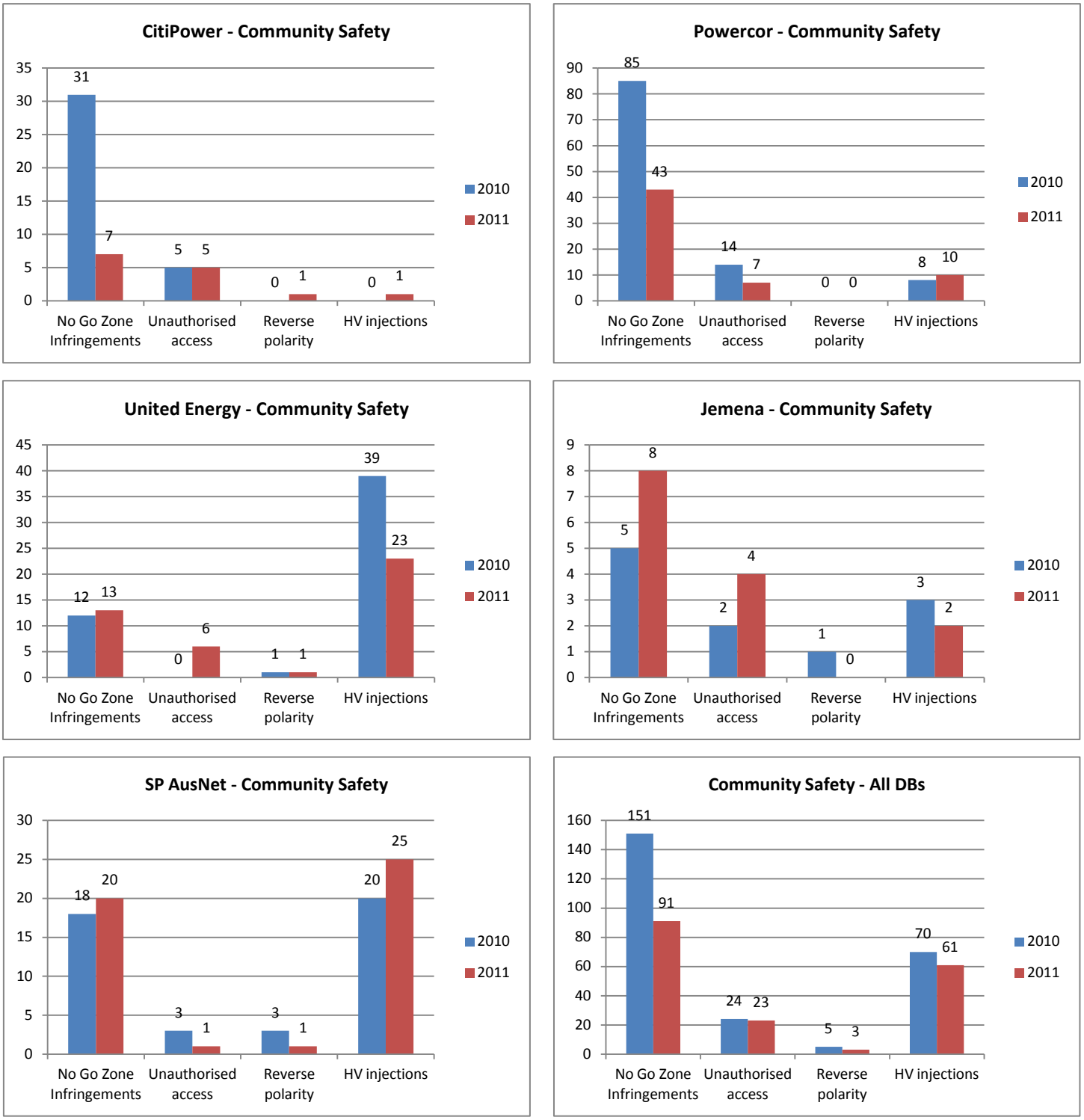
High voltage injections are generally caused by a lightning strike onto the electricity network, or when a high voltage line contacts the low voltage supply as a result of vegetation contact, a failure of a network asset, or when a vehicle hits a pole. A high voltage injection into the low voltage supply may cause significant damage of customer's premises and or appliances.

Table 11 Safety incidents involving the public by distribution business

ITEM	TOTAL	CitiPower	Powercor	Jemena	United Energy	SP AusNet
No Go Zone infringements	91	7	43	8	13	20
Unauthorised access	23	5	7	4	6	1
Reverse polarity	3	1	0	0	1	1
High voltage injections	61	1	10	2	23	25

Table 12 Safety incidents involving the public by transmission business

ITEM	TOTAL	SP AusNet	Basslink
No Go Zone infringements	1	1	0
Unauthorised access	7	7	0



(The 2010 safety performance report had an incorrect quantity for NGZ infringements for SP AusNet which has been corrected in the graph above)

Figure 4 Safety incidents involving the public by business

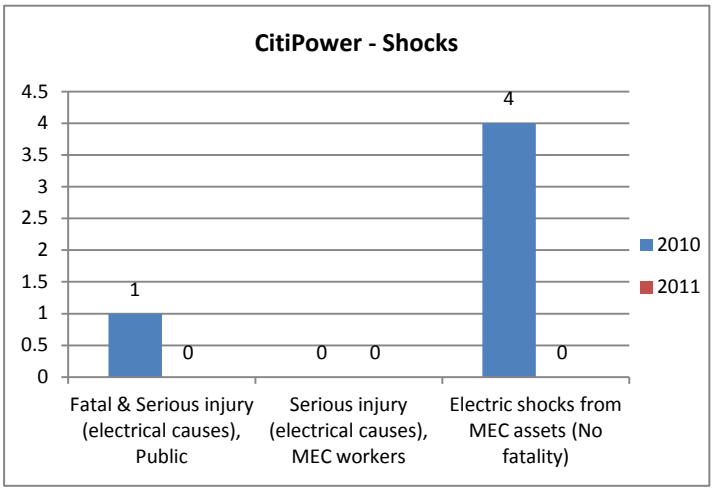
Incidents involving electric shock

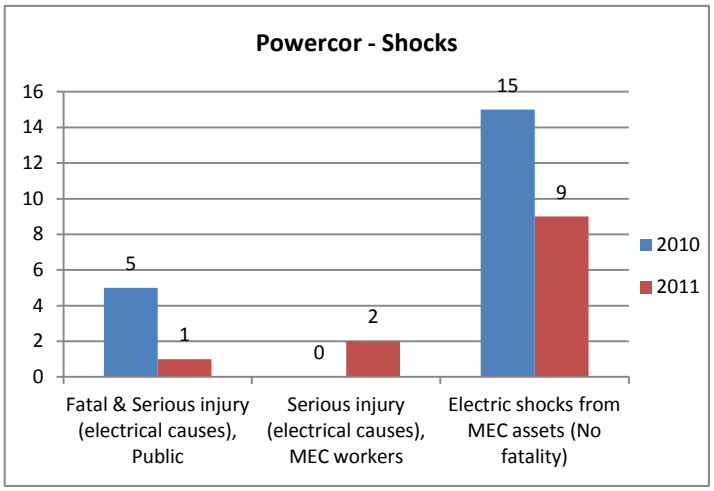
The number of incidents reported as an electric shock, including those resulting in serious injury or a fatality, is one of the most important measures in relation to electrical safety. The safety of the public, including the workers and contractors of the MECs, is of utmost importance. In 2011, there were no reported fatalities to MEC workers. However, there were two fatal incidents where the public have made contact with powerlines.

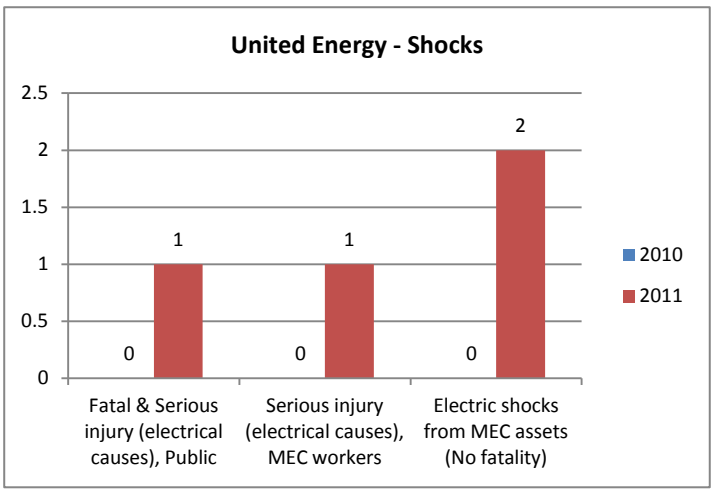
The measures in Table 13 detail the level of electric shock from the electricity network assets, and include shock from No Go Zone breaches and accidents involving the employees or contractors of the DBs. ESV conducts an investigation into incidents involving serious electric shock, and assists other agencies such as WorkSafe in their investigations. In addition to those issued by MECs, ESV regularly issues 'Safety Alerts' to industry and the community to highlight dangerous situations.

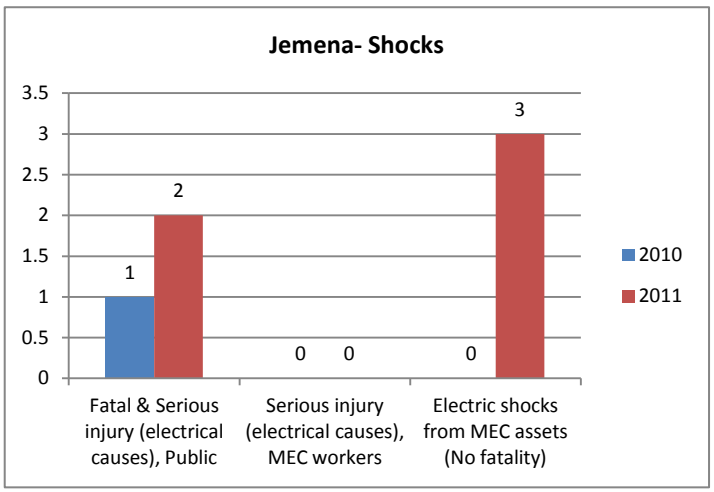
Table 13 Electric shock from electrical distribution assets

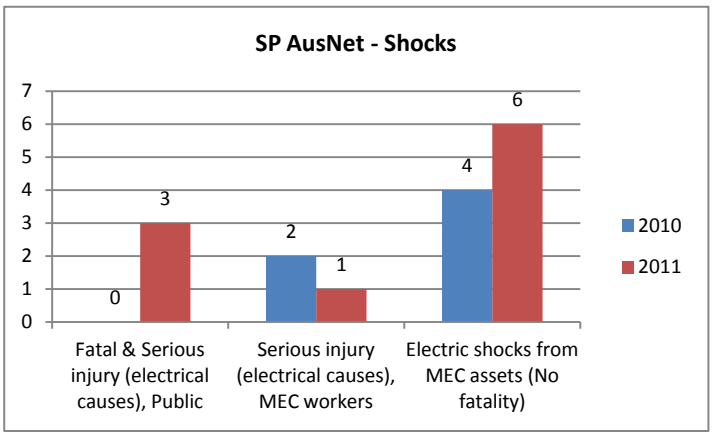
ITEM	TOTAL	Citipower	Powercor	Jemena	United Energy	SP AusNet
Electric shock – Fatal or serious Injury (Public – excludes vehicle accident)	7	0	1	2	1	3
Electric Shock – fatal or serious injury (MEC workers)	4	0	2	0	1	1
Electric Shock – Non-serious injury	20	0	9	3	2	6











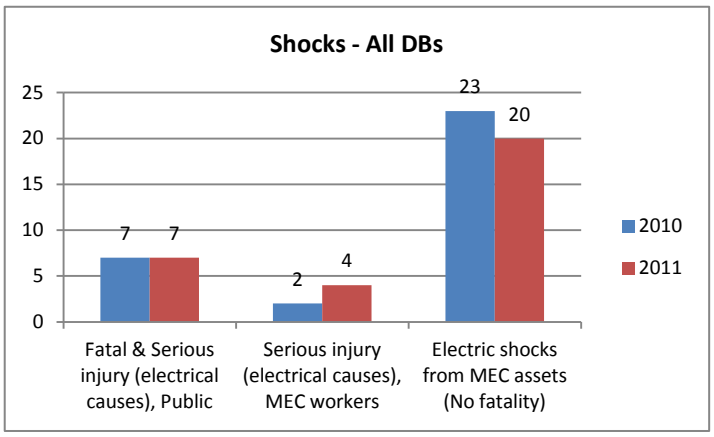


Figure 5 Electric shock from distribution assets

Safety programs

During 2010, the AER provided a determination on the allowable expenditure for DBs for the five-year period between 2011 and 2015. This process, known as the EDPR, included expenditure on works that the AER classified as safety-related. As part of the assessment of the works submitted to the AER, ESV reviewed the DBs' submissions and provided to the AER a report on those works that ESV agreed were necessary to improve safety. Volumes were reviewed and ESV agreed to continually monitor the volume of work undertaken by the DBs to ensure safety was not compromised.

Powercor and CitiPower have not set annual targets for their safety programs but submitted to the AER, as part of the EDPR process, an estimate of the work to be done. ESV is monitoring their performance against these estimates.

United Energy is behind on several of its annual targets and ahead on others and consequently may not meet some of its five-year targets. A number of programs have not commenced but advice is they will do so further into the five-year cycle. United Energy advised that its program was held under constant review, and was prioritised on a risk management basis. Revised schedules for the longer lead-time programs were provided to ESV.

Jemena is ahead of its 2011 annual targets for most of its programs. A small number of programs have not yet commenced but it advises they will be initiated in 2012.

SP AusNet distribution has commenced all of its programs and is ahead of its 2011 targets in several cases. Some programs still require ground work to progress and are behind target at present. SP AusNet reviewed its program and issued to ESV a revised five-year program of works to ensure all targets were met. The new program shows new annual targets to be met to accelerate programs currently behind schedule and ESV will monitor progress to these new targets.

The tables below (Tables 14 to 18) shows the AER agreed safety works and the volumes undertaken by the DBs up to the end of 2011.

Table 14 CitiPower - AER safety-related programs

Program	Measure	2011 Total	2011 Estimate #	DB Comments
Pole replacements - subtransmission	Number of poles replaced	1	11	Total determined from asset inspection and condition monitoring
Pole replacements - HV	Number of poles replaced	41	44	Total determined from asset inspection and condition monitoring
Pole replacements - LV	Number of poles replaced	61	109	Total determined from asset inspection and condition monitoring
Pole replacements – Stay poles	Number of poles replaced	0	12	Total determined from asset inspection and condition monitoring
Staked poles	Number of poles staked	270	255	Total determined from asset inspection and condition monitoring
Crossarm replacements	Number of crossarms replaced	870	700	Total determined from asset inspection and condition monitoring
HV overhead conductor replacement	Route kilometres of HV conductor replaced	Not available	3	IT upgrade required to enable figures to be provided
LV overhead conductor replacement	Route kilometres of HV conductor replaced	Not available	1	IT upgrade required to enable figures to be provided

(# CitiPower has set no annualised targets. The 2011 estimate is the volume of work submitted by CitiPower to the AER for revenue determination purposes.)

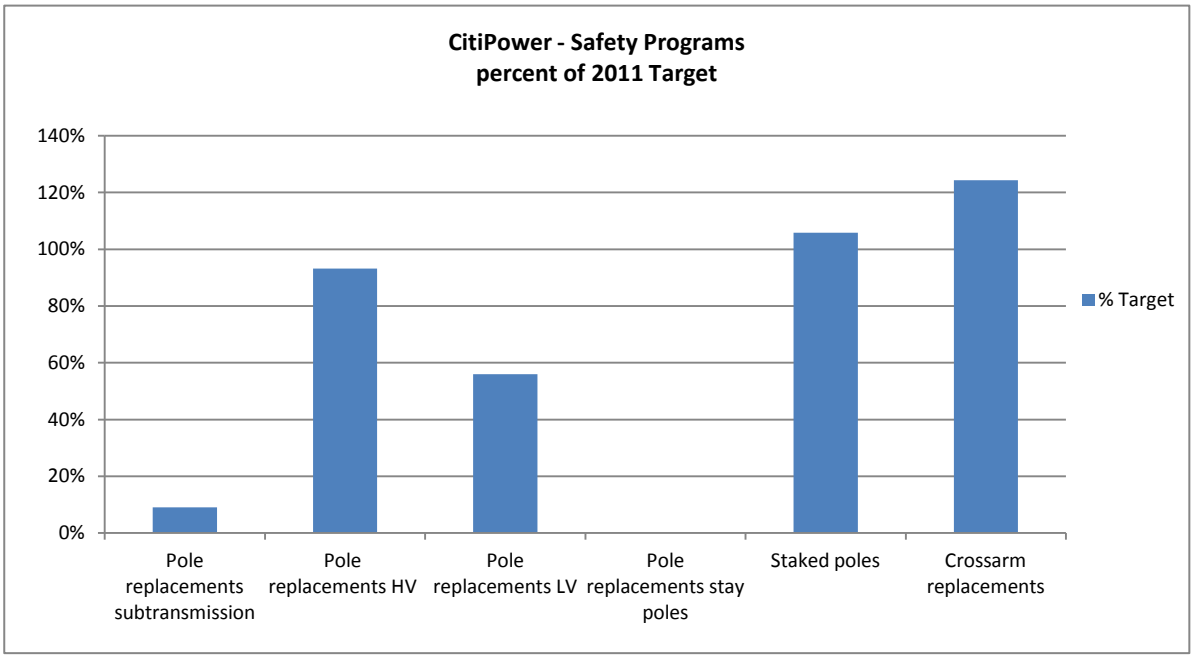


Figure 6 CitiPower Safety Programs – per cent of 2011 target

Note: Overhead conductor replacement program not shown in graph above as data is not available

Table 15 Powercor - AER safety-related programs

Program	Measure	2011 Total	2011 Estimate#	DB Comments
Pole replacements - subtransmission	Number of poles replaced	21	64	Totals determined from asset inspection and condition monitoring
Pole replacements - HV	Number of poles replaced	970	628	Totals determined from asset inspection and condition monitoring
Pole replacements - LV	Number of poles replaced	224	200	Totals determined from asset inspection and condition monitoring
Pole replacements – Stay poles	Number of poles replaced	21	18	Totals determined from asset inspection and condition monitoring
Staked poles	Number of poles staked	856	902	Totals determined from asset inspection and condition monitoring
Crossarm replacements	Number of crossarms replaced	4964	3200	Totals determined from asset inspection and condition monitoring
HV overhead conductor replacement	Route kilometres of HV conductor replaced	Not available	460	IT upgrade required to enable figures to be provided
LV overhead conductor replacement	Route kilometres of HV conductor replaced	Not available	4	IT upgrade required to enable figures to be provided

(# Powercor has set no annualised targets. The 2011 estimate is the volume of work submitted by Powercor to the AER for revenue determination purposes)

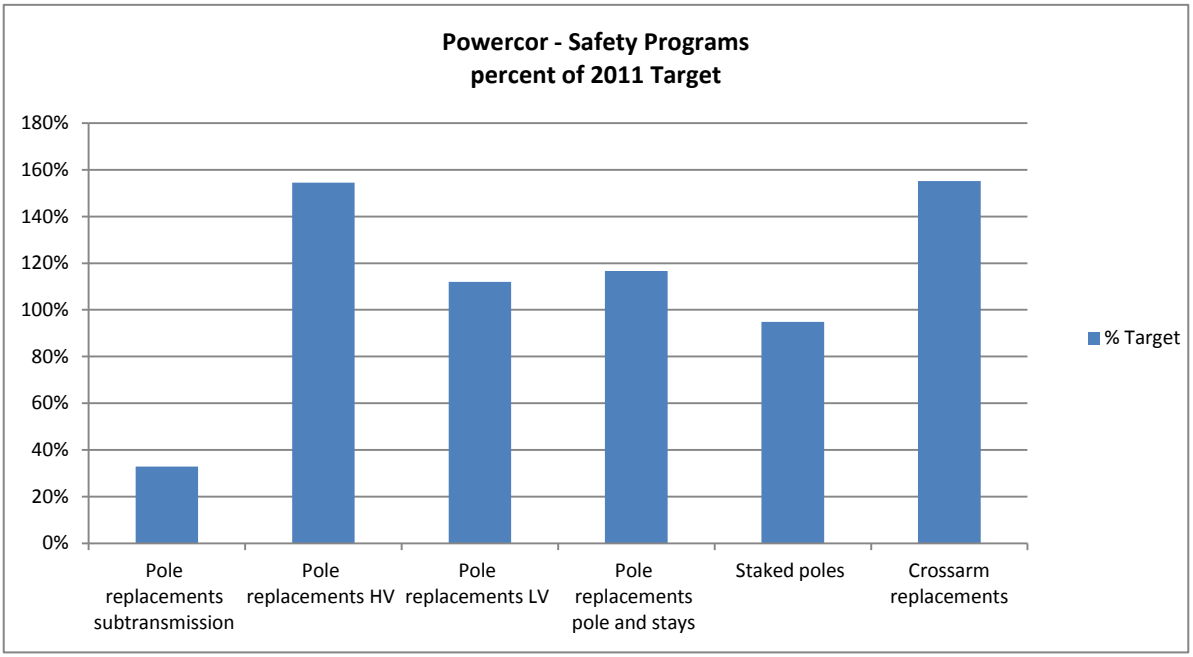


Figure 7 Powercor Safety Programs – per cent of 2011 targets

Table 16 United Energy - AER safety-related programs

Program	Measure	2011 Total	2011 Target	DB Comments
Planned non-preferred services replacements	Number of services	11345	26000	Replacement is based on condition as determined during scheduled inspections.
Planned replacement of non-preferred services due to Height	Number of services	1873	4983	Replacement is based on condition as determined during scheduled inspections.
Removal of public lighting switchwire	Spans removed	1067	n/a	Removal based on condition as determined during inspections and maintenance works.
Replace existing SWER lines	km of existing SWER removed	0	n/a	Program is yet to commence.
Install GFN	Number of zone substations	0	n/a	Program is yet to commence.
Replace crossarms – pole top fire mitigation	Number of crossarms replaced	0	n/a	Program is yet to commence.
Replace sets of insulators – pole top fire mitigation	Number of insulator sets replaced	0	n/a	Program is yet to commence.
Inspect, clean, tighten – pole top fire mitigation	Poles completed	0	n/a	Program is yet to commence.
Replace crossarms – based on age and condition	Number of crossarms replaced	1747	n/a	Replacement is based on condition as determined during scheduled inspections.
Pole top structure – HV fuse replacement	Number replaced	221	174	Replacement is based on condition as determined during scheduled inspections.
Pole top structure – Surge Diverter replacement	Number replaced	284	236	Replacement is based on condition as determined during scheduled inspections.
Install HV ABC in HBRA	Metres of HV ABC	0	4800	Requirements under investigation.
Install LV ABC in HBRA	Metres of LV ABC	1338	2950	Requirements under investigation.
Replace poles – based on age and condition	Number replaced	492	n/a	Replacement is based on condition as determined during scheduled inspections.
Stake poles – based on age and condition	Number replaced	384	n/a	Replacement is based on condition as determined during scheduled inspections.
Replace overhead steel conductors in HBRA	kilometres of conductor replaced	38	n/a	Replacement is based on condition as determined during scheduled inspections
Replace other conductors in HBRA	kilometres of conductor replaced	2	n/a	Replacement is based on condition as determined during scheduled inspections.
Install backup protection schemes	Zones substations completed	0	3	Program is yet to commence.
Service line clearance – overhead services requiring relocation	Number of services	2	3318	Replacement based on condition as determined during scheduled inspections. Volumes may not reach forecast. To be reviewed at end of 2012.
Service line clearance – overhead services requiring undergrounding	Number of services	0	830	Replacement based on condition as determined during scheduled inspections. Volumes may not reach forecast. To be reviewed at the end of 2012.
Overhanging trees capex (u/g, line relocation, ABC, etc.)–HBRA	Spans removed	0	n/a	Requirements not yet assessed.
Overhanging trees capex (u/g, line relocation, ABC, etc.)– LBRA	Spans removed	0	n/a	Requirements not yet assessed.

n/a – no target set for 2011

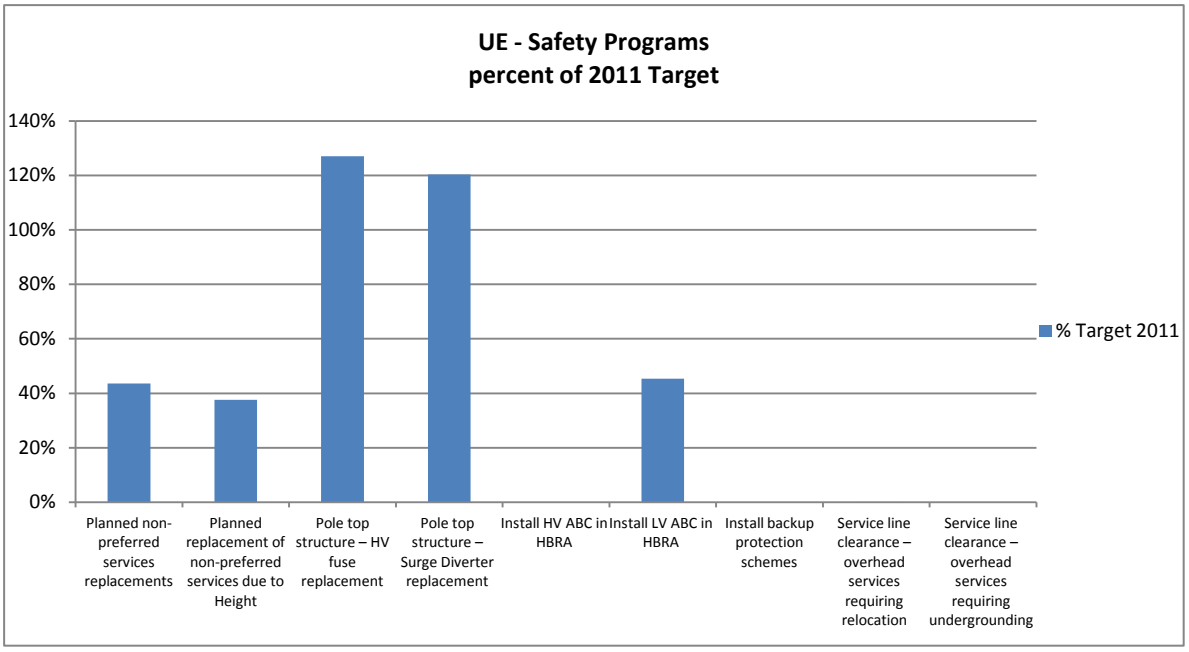


Figure 8 UE Safety Programs – per cent of 2011 target

Table 17 Jemena - AER safety-related programs

Program	Measure	2011 Total	2011 Target	DB Comments
Planned non-preferred services replacements	Number of services	4168	6000	Lower than forecast work due to the need to complete detailed scoping works.
Planned replacement of non-preferred services due to height	Number of services	4	1482	Lower than forecast work due to the need to complete detailed scoping works.
Removal of public lighting switchwire	Spans removed	200	n/a*	
Replace existing SWER lines	km of existing SWER removed	0	n/a*	
Install GFN	Number of zone substations	0	n/a*	
Replace crossarms/insulator sets – pole top fire mitigation	Number of crossarms replaced	619	567	Program ahead of target.
Replace crossarms – based on age and condition	Number of crossarms replaced	2194	1823	Program ahead of target.
Replace poles – based on age and condition	Number of poles replaced	344	258	Program ahead of target.
Stake poles – based on age and condition	Number of poles staked	594	223	Program ahead of target.
Replace undersized poles	Number of poles replaced	46	n/a*	
Stake undersized poles	Number of poles staked	58	n/a*	
Replace overhead conductor – mainly steel	km of overhead conductor replaced	26	20	Program ahead of target.
Service line clearance – overhead services requiring relocation	Number of services replaced	0	1260	In order to complete this work efficiently, these have been grouped into large packages of work. This work has commenced in 2012.

Service line clearance – overhead services requiring undergrounding	Number of services replaced	0	315	The vegetation inspection cycle has been used to identify services that require undergrounding. Services will be packaged up in 2012.

*n/a – no target set for 2011

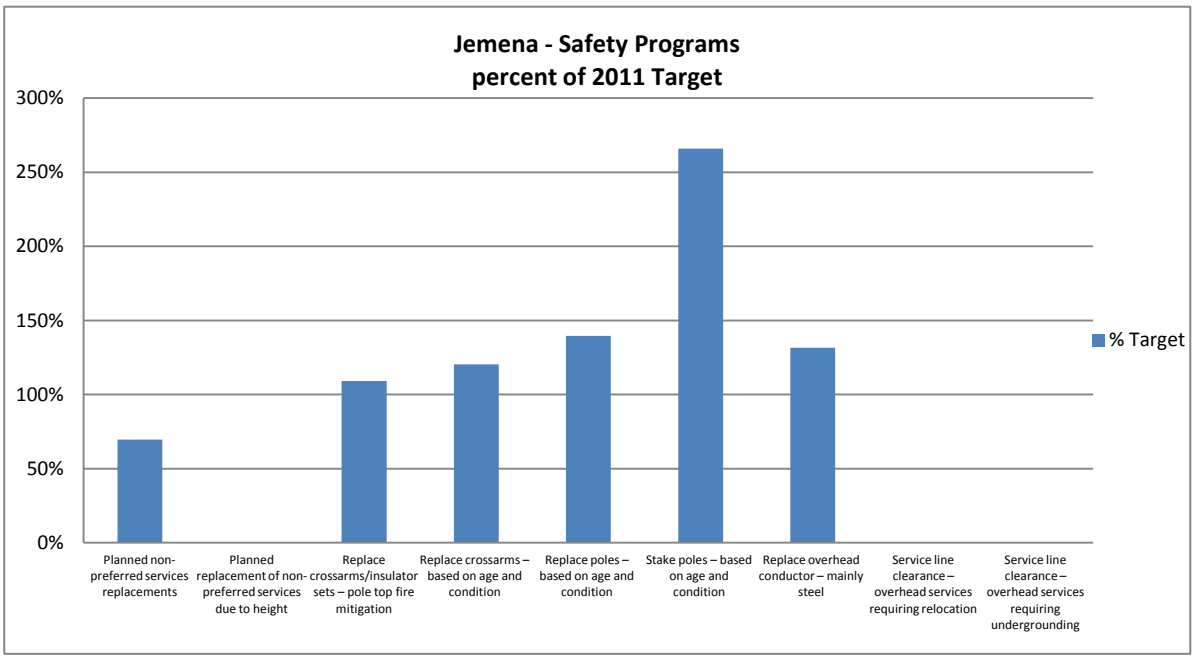


Figure 9 Jemena Safety Programs – per cent of 2011 target

Table 18 SP AusNet Distribution - AER safety-related programs

Program	Measure	2011 Total	2011 Target	DB Comments
Crossarm replacement	number of crossarms replaced	11770	9357	Program ahead of schedule.
Pre-emptive replacement of steel conductor	kilometres of conductor	37	621	There is significant survey and design work required prior to actual replacement. Several projects delayed due to wet weather.
Pre-emptive replacement of copper conductor	kilometres of conductor	19	40	There is significant survey and design work required prior to actual replacement. Several projects delayed due to wet weather.
Replace HV pin type insulator sets – pole top fire mitigation	number of insulator sets replaced	413	1130	For efficiency, program has been aligned with schedule inspection and maintenance programs in 2013 and 2014.
Targeted replacement of EDOs	number of EDOs replaced	4723	1908	Program ahead of schedule.
Targeted bird and animal proofing in HBRA	number of asset sites fauna proofed	2363	1200	Program ahead of schedule.
Replace all SWER OCRs	number of OCRs replaced	1	47	Completion of trials and delivery of new devices has caused delay.
Replace/upgrade 3-phase ACR controllers	number of units upgraded/replaced	4	21	Delays have been due to the investigation, scoping and design of a new type of ACR.
Augment spans (u/g, relocate, ABC) – Overhanging trees in HBRA	number of spans	92	*n/a	Program ahead of schedule.

*n/a – no target set for 2011

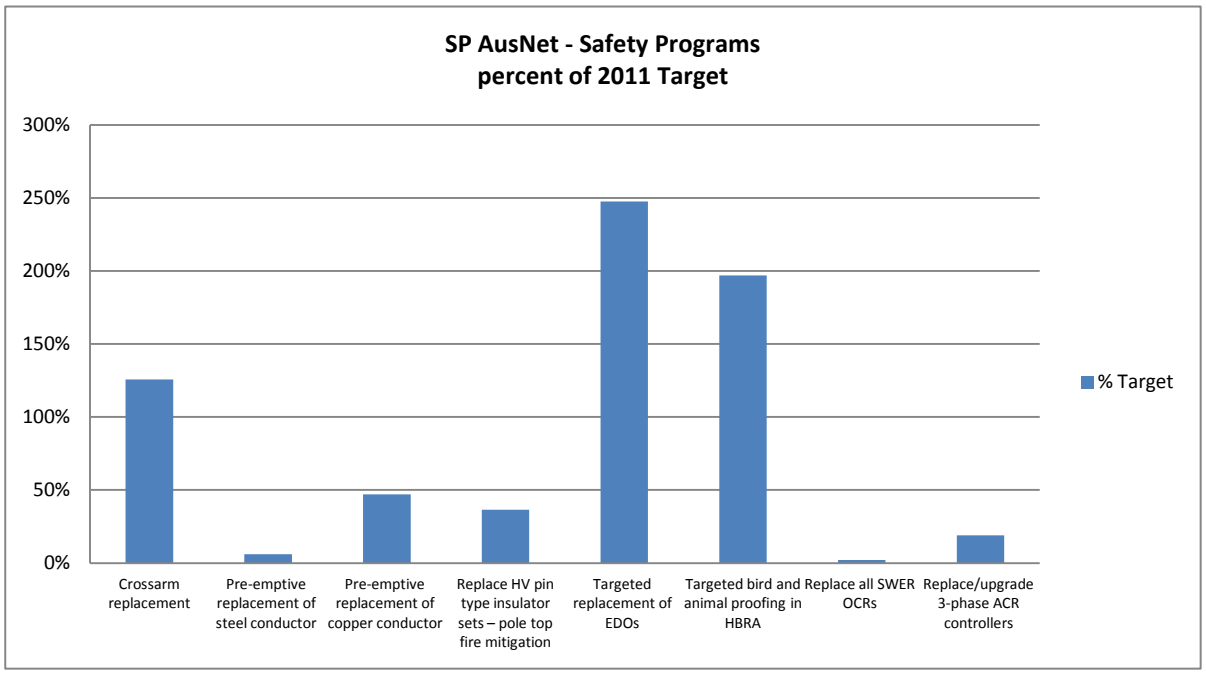


Figure 10 SP AusNet Safety Programs – per cent of 2011 target

Directions and exemptions

As an outcome of the VBRC, ESV issued a number of directions to the DBs to improve the safety of overhead high voltage lines. Also there were a number of regulatory changes that required the DBs to alter their business activities significantly and ESV approved a transition program for DBs to meet these new regulatory obligations. ESV issued exemptions that were required to be met by a specified time period ranging from three to five years, and the tables and graphs below show the progress that the DBs are making in meeting these directions and exemptions.

All of the DBs are at or beyond their targets for directions and exemptions.

Table 19 CitiPower – Directions and Exemptions

Program	Measure	2011 Total	2011 Target	DB Comments
Cyclic clearing – ABC or insulated cable	Per cent of spans	13	13	On target
Cyclic clearing – Powerlines other than ABC or insulated cable (LBRA)	Per cent of spans	14	13	Ahead of target
Overhanging trees (cut)	Per cent of spans	100	100	On target

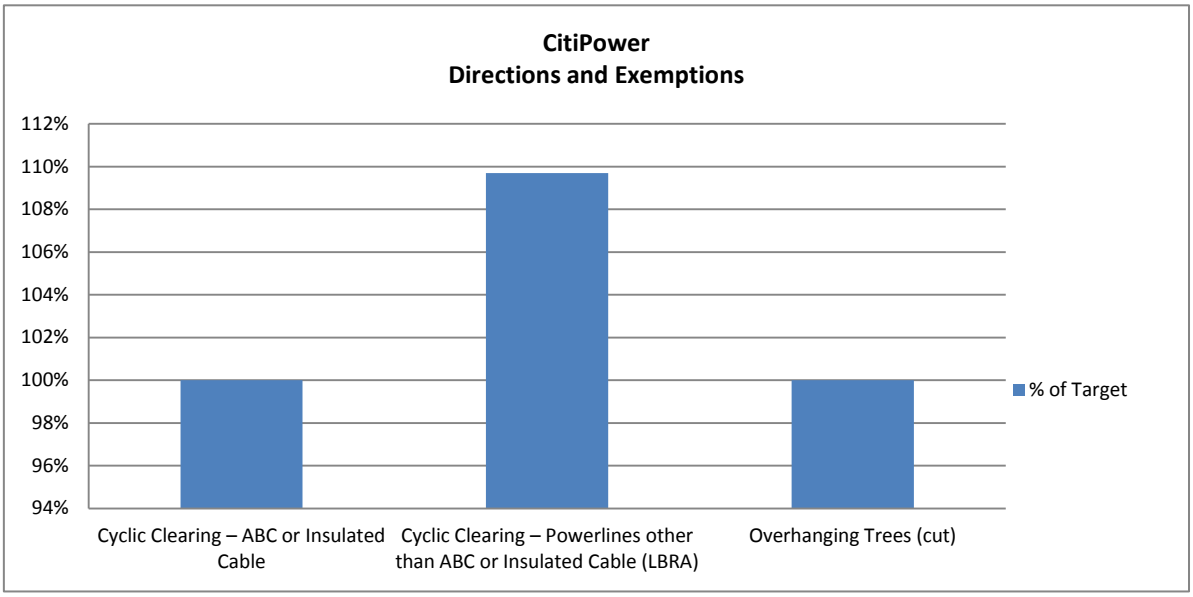


Figure 11 CitiPower - Directions and exemptions

Table 20 Powercor – Directions and exemptions

Program	Measure	2011 Total	2011 Target	DB Comments
Survey of HV spans (clearances) - HBRA	Spans surveyed	n/a*	n/a*	
Vibration dampers - HBRA	Number of spans	n/a*	n/a*	
Armour rods - HBRA	Number of spans	n/a*	n/a*	
Cyclic clearing – ABC or insulated cable (all areas)	Per cent of spans	13	13	On target
Cyclic clearing – Powerlines other than ABC or insulated cable (LBRA)	Per cent of spans	13	13	On target
Cyclic clearing – Powerlines other than ABC or insulated cable (HBRA)	Per cent of spans	8	8	On target
Overhanging trees (cut)	Per cent of spans	100	100	On target

*n/a – no target set for 2011

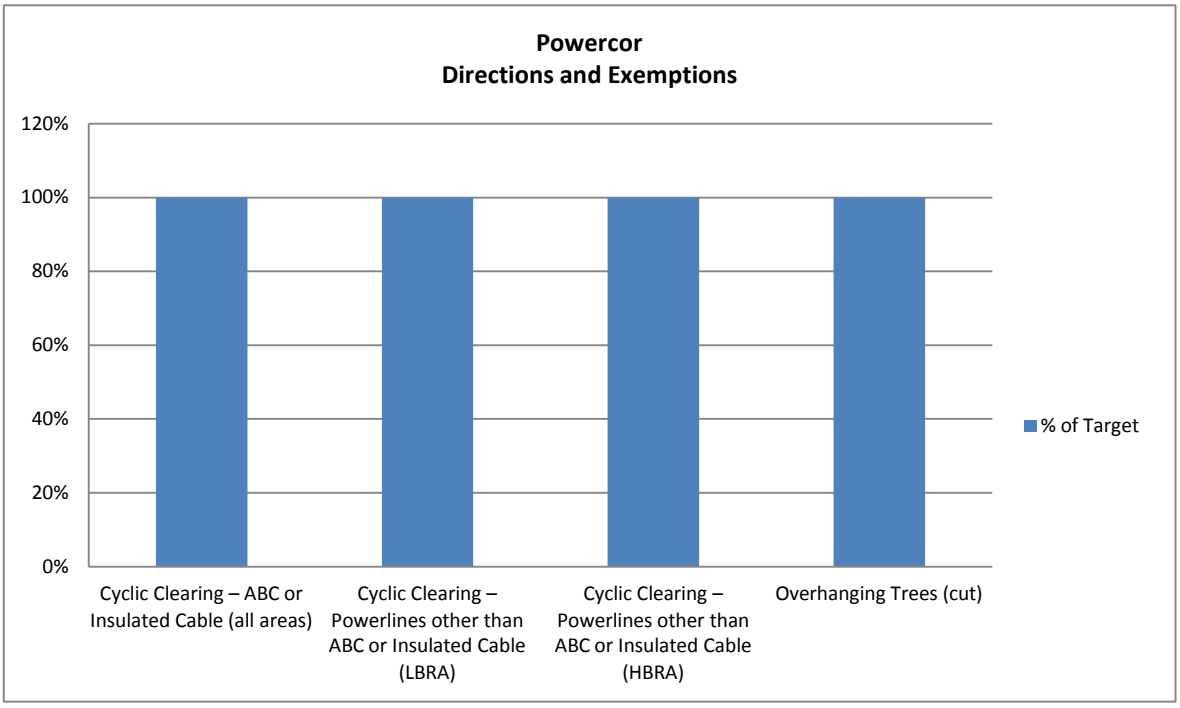


Figure 12 Powercor - Directions and exemptions

Table 21 United Energy – Directions and exemptions

Program	Measure	2011 Total	2011 Target	DB Comments
Vibration dampers	Number of spans	62	n/a*	Work required will be scheduled as part of routine maintenance
Armour rods	Number of spans	62	n/a*	Work required will be scheduled as part of routine maintenance
Cyclic clearing – ABC or insulated cable (all areas)	Per cent of spans	39	22	Ahead of schedule
Cyclic clearing – Powerlines other than ABC or insulated cable (LBRA)	Per cent of spans	35	30	Ahead of schedule
Cyclic clearing – Powerlines other than ABC or insulated cable (HBRA)	Per cent of spans	121	78	Program is complete and now included in scheduled maintenance
Overhanging Trees (cut) - Powerlines other than ABC and insulated cables (LBRA)	Number of spans	218	24	Ahead of schedule
Overhanging Trees (cut) - Powerlines other than ABC and insulated cables (HBRA)	Number of spans	1319	300	Ahead of schedule

*n/a – no target set for 2011

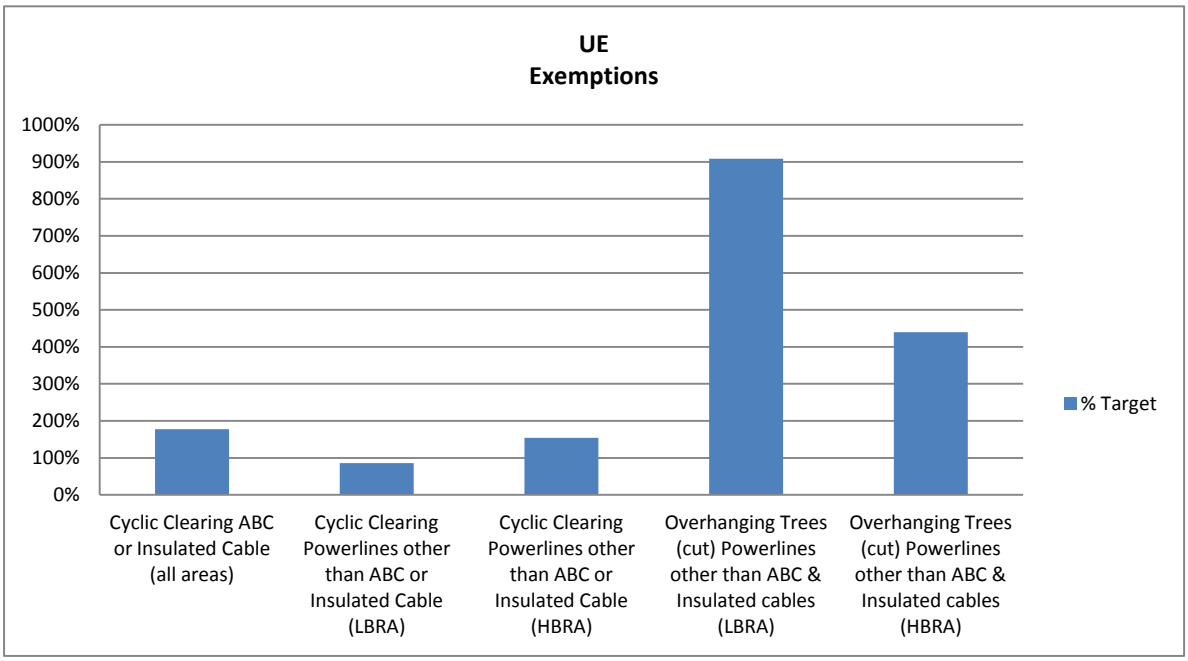


Figure 13 United Energy – Directions and exemptions

Table 22 Jemena – Directions and exemptions

Program	Measure	2011 Total	2011 Target	DB Comments
Vibration dampers	Number of spans	1334	700	Ahead of schedule
Armour rods	Number of spans	1235	700	Ahead of schedule
Cyclic clearing – ABC or insulated cable (all areas)	Per cent of spans	32	22	Ahead of schedule
Cyclic clearing – Powerlines other than ABC or insulated cable (LBRA)	Per cent of spans	40	40	On target
Cyclic clearing – Powerlines other than ABC or insulated cable (HBRA)	Per cent of spans	100	78	Ahead of schedule

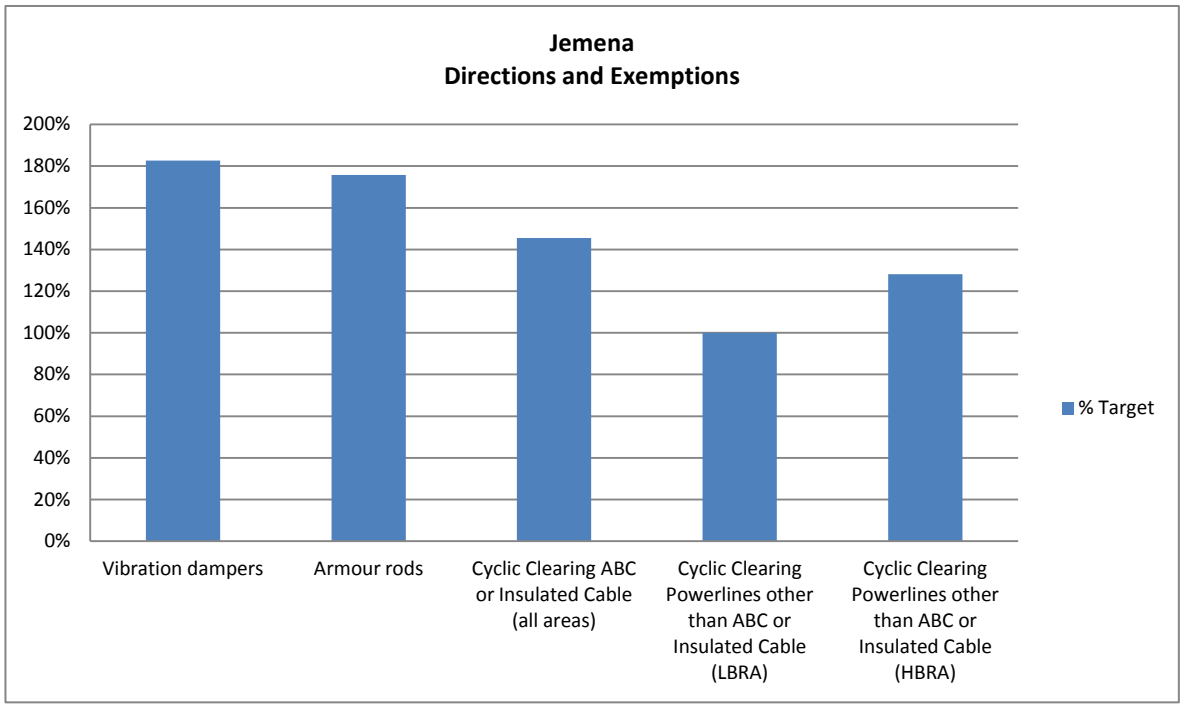


Figure 14 Jemena – Directions and exemptions

Table 23 SP AusNet – Directions and Exemptions

Program	Measure	2011 Total	2011 Target	DB Comments
Fitting of armour rods (HBRA)	Number of spans	n/a*	n/a*	Planned to commence in 2012
Fitting of dampers (HBRA)	Number of spans	n/a*	n/a*	Planned to commence in 2012
Fitting of HV spacers (HBRA)	Number of spans	n/a*	n/a*	Planned to commence in 2012
Cyclic clearing – ABC or insulated cable (all areas)	Per cent of spans	0	0	Program on schedule
Cyclic clearing – Powerlines other than ABC or insulated cable (LBRA)	Per cent of spans	50	50	Program on schedule
Cyclic clearing – Powerlines other than ABC or insulated cable (HBRA)	Per cent of spans	93	93	Program on schedule

*n/a – to commence in 2012

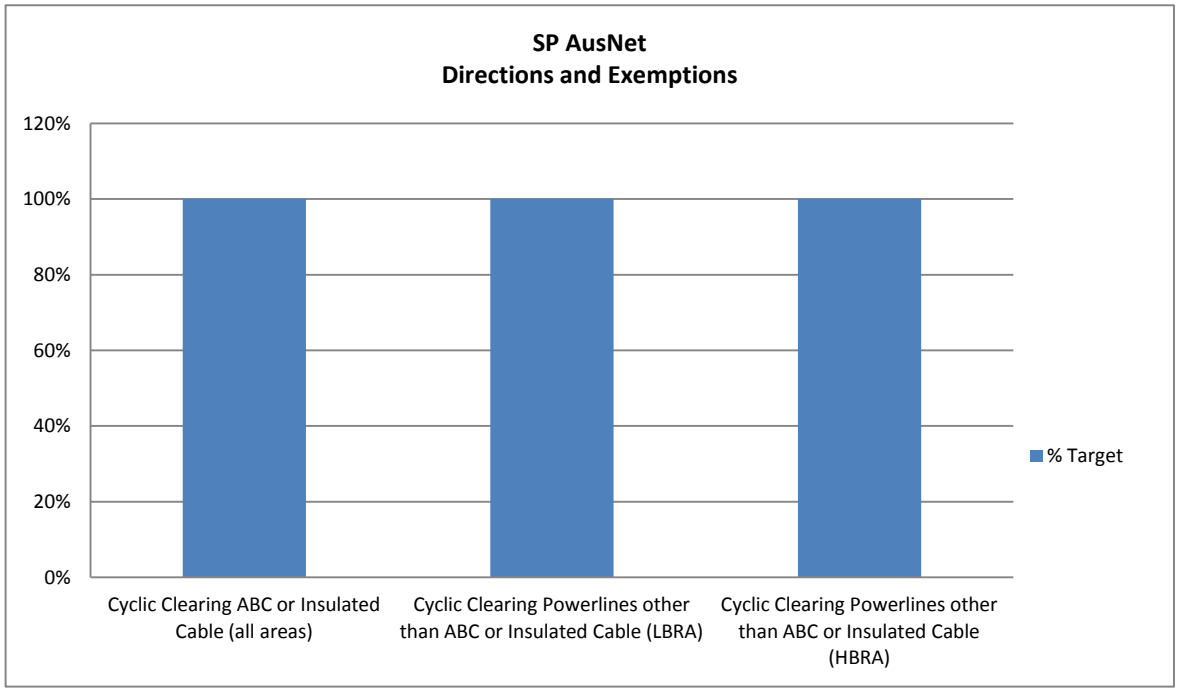


Figure 15 SP AusNet Directions and exemptions

6 Key safety events

Serious electrical Incidents

ESV investigated several serious incidents during 2011 and in one case prosecuted an individual for causing a reverse polarity in an advance metering infrastructure (AMI) meter installation. Below is a summary of these investigations:

- On the 15 March 2011 a person was electrocuted having picked up a live low voltage conductor that had been brought down by a tree. Investigation found that even though the tree was outside the regulatory clearance space it was of sufficient height that when it fell it came into contact with a low voltage overhead line on the other side of the road.
- On 14 July 2011, a non-electrical worker was killed and another non-electrical worker received severe electrical burns while working in an elevated work platform in the vicinity of an overhead 22,000 volt powerlines in Spotswood. Investigation found that the workers intruded into the No Go Zone area.
- A reverse polarity incident in Highett occurred where a member of the public received an electric shock following an AMI meter installation. This resulted in a recommendation in 2011 for ESV to proceed with a prosecution of the meter installer and ultimately in 2012 the prosecution was successful.
- ESV, together with WorkSafe, investigated an incident where a tree cutter working for a DB received a high voltage shock when the tree he was cutting contacted a 22,000 volt powerline.
- ESV investigated an incident reported in June 2011 where a child received electrical burns having come into contact with a fallen live service line. ESV investigated the cause of the failure of the service line.
- A number of incidents during 2011 and 2012 involving AMI meters were investigated by ESV and the vast majority of these were found to have failed due to criminal damage. In May 2012, ESV released a draft report on the ESV website that found that the meters failed in a safe mode.
- ESV investigated an incident where an apprentice lineworker made accidental contact with a live connection. The apprentice received flash burns while performing an electrical insulation test on the low voltage underground cables in a newly commissioned “kiosk” type substation.
- ESV investigated an incident involving contact by a lineworker. The lineworker received burns to his hands while working on a single phase 22,000 volt overhead conductor that was alive.

- ESV investigated an incident involving a lineworker who sustained electrical burns to their face as a result of an electrical flash while conducting a test at an LV fuse box as part of a commissioning test of a substation.

Due to a number of incidents involving the failure of electricity company workers to follow mandatory safety procedures, ESV raised its serious concerns early in 2012 with DB general managers and requested they reinforce through their businesses the need to follow procedures and processes documented in their ESMS when working on network assets.

Asset inspection course approvals

Having approved the newly designed Certificate II in asset inspection qualification in 2010, ESV in 2011 under the amended *Electricity Safety (Bushfire Mitigation) Regulations* required that course providers demonstrate their ability to deliver this program. Subsequently ESV received a submission from GippsTAFE to be an approved asset inspection training provider. ESV considered the course material, time frame of the course, methods of course presentation, experience and qualifications of the trainers, and other matters before approving GippsTAFE.

MECs requested recognition of prior learning (RPL) for their existing asset inspectors to achieve compliance with the regulatory change. GippsTAFE developed a package for the industry to assess individuals RPL against the requirements of the ESV approved training course. ESV reviewed and accepted GippsTAFE RPL package, which was subsequently utilised by many of the existing inspectors to demonstrate their competence.

Blue Book

A function of ESV is to ensure safety standards are maintained for the design, construction, operation and maintenance of electrical installations and electricity supply networks. To assist in achieving these safety standards, ESV has established the Electrical Safety Committee, formed under provisions of Section 8 of the *Energy Safety Act 2005*, whose function is to develop and maintain a *Code of practice for work on or near high voltage electrical apparatus (The Blue Book).*

The Electrical Safety Committee was reconvened in 2011 to review and revise the Blue Book as a result of changes to the *Electricity Safety (Installations) Regulations* and due to revocation of the *Electricity Safety (Network Assets) Regulations*.

Changes were necessary to address ambiguities previously noted by the industry and to align the Blue Book with international standards. A new provision was developed to provide guidance for tree clearing work being performed by non-utility workers in the vicinity of overhead electric lines in accordance with the *Electricity Safety (Installations) Regulations 2009*.

The draft 2012 Blue Book was published on the ESV website for comments and final outworking.

The committee members are commended for their work in this revision of the Blue Book.

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 and 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 and LV)
Shock due to neutral failure	Number of incidents
Progress against specified improvement programs	Per cent 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	Per cent of Schedule 1 and 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 157 km^2 area of Melbourne's CBD, docklands and inner city. Its network includes 6500 km of wire on approximately 60,000 poles. About 20 per cent (by length) is classed as 'CBD'; nearly 37 per cent is underground. It has common ownership and a common management structure with Powercor.

Jemena

Jemena supplies electricity to around 319,000 customers (about 88 per cent residential) in approximately 950 km^2 area of Melbourne's city and north-western suburbs, with Tullamarine Airport at its approximate centre. It includes around 6000 km of wire (about 75 per cent through the urban area) on 92,000 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 529,000 poles, and nine per cent of its length runs underground.

SP AusNet

SP AusNet supplies around 649,000 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 (encompassing Traralgon, Leongatha, and Bairnsdale), and surrounding the high country that is not connected to mains power. SP AusNet has 48,900 km of line (85 per cent rural and 96 per cent above ground) and approximately 373,000 poles.

United Energy

United Energy supplies about 620,000 customers (90 per cent residential) in a 1500 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.

C Victorian Electricity Transmission Networks

SP AusNet

SP AusNet electricity transmission network consists of approximately 6572 km of transmission lines carrying electricity at extra-high voltages on approximately 13,000 towers principally from generation power stations located in the Gippsland region of eastern Victoria to terminal stations around Victoria.

BassLink

Basslink transmission consists mainly of a high-voltage direct current (HVDC) link connecting the Loy Yang Power Station, on the Australian mainland to the George Town terminal station in northern Tasmania. The link consists of 3.2 km of overhead 500 kV AC from SP AusNet's Loy Yang terminal station, 57.4 km of overhead 400 kV DC, 6.6 km of 400 kV DC underground cable in Victoria, a 290 km long submarine HVDC cable from McGaurans Beach, Victoria to Tasmania, and a connection to the Transend terminal station in George Town, Tasmania.

D Recommendations of the 2009 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.