

Review of Victoria's Electricity and Gas Network Safety Framework

Interim Report Overview



October 2017

Overview

This Interim Report presents findings and draft recommendations for public comment.

It proposes an integrated set of actions to position Victoria at the forefront of the safety regulation of electricity and gas networks.

It incorporates ten essential elements, chiefly focussed on strengthening the capabilities and regulatory approach of the regulator, Energy Safe Victoria (ESV), underpinned by consolidated and improved legislation.

Strengthening the Energy Safety Framework: Ten Essential Elements

- **Strengthen governance by establishing ESV as a three-person commission**
 - stronger governance of regulatory decisions and approach
 - stronger corporate governance of ESV itself
- **Build a stronger and more active ESV presence out 'on the ground'**
 - more safety inspectors and auditors to 'test, challenge and expose'
- **Strengthen ESV's capabilities and preparedness to take strong regulatory action**
 - ESV must operate as a confident regulator, always prepared to take strong action if necessary – and backed with the capabilities to do this well
- **Maintain active and positive engagement with network businesses**
 - with ESV clearly recognised, and respected, as the safety regulator, with a fundamental obligation to serve the Victorian community first
- **Emphasise building and supporting deep safety cultures within network businesses**
 - safety must be deeply embedded within the organisational cultures of network businesses, their systems and processes, with strong and highly engaged leadership from the board and chief executive level down
 - strong engagement with the workers who maintain and build the networks
- **Substantially strengthen ESV's analytical capabilities**
 - stronger data analytics to provide statistically robust information about safety risks for the Victorian community
 - a comprehensive integrated intelligence system – to target audits and inspections and to identify emerging risks earlier
- **Create a single energy safety law, with "safety-case" based regulation at its core**
 - providing the foundations of a regulatory system built on achieving safety outcomes

- with a longer-term aspiration of more 'outcomes-based' regulation and less prescriptive regulation – but only when there is deep confidence established in the maturity of the safety-case based regulatory framework
 - : the onus is on network businesses and ESV collectively to build this confidence
- **Better guidance to network businesses and sharing of best practices**
 - helping network businesses to efficiently comply with safety regulation requirements
 - using ESV's 'convening power', and its national leadership position, to identify and share best practices
- **Position ESV as a modern and progressive regulator looking over the horizon**
 - to anticipate the challenges and opportunities of new energy markets
 - and assist the economic regulator as a trusted and expert safety adviser
- **Strong accountability for implementation of actions in response to the final recommendations of this Review following government consideration**
 - implementation reporting must not be a 'box ticking' exercise

Final Report

The material in this Interim Report, including the various findings and recommendations, should be treated as draft only. The Review will prepare final findings and recommendations only after it has considered submissions in response to the Interim Report. The Review's final report will be submitted to the Minister for Energy, Environment and Climate Change in December 2017.

Executive Summary

Context

Energy network safety has long been a concern for the Victorian community and a high priority for successive Victorian governments.

The Longford gas explosion in 1998, while occurring in a production facility outside the transmission and distribution network itself, highlighted the impacts of a major accident disrupting gas supply to the state, and emphasised the dangers that workers in the gas industry face.

The Black Saturday bushfires in February 2009 brought electricity network safety concerns to the fore, particularly as most of the 173 lives lost that day were ultimately linked with fires initially sparked by faults in electricity lines running through tinder-dry bushland.

Both the Longford and Black Saturday incidents were examined by Royal Commissions, and the recommendations from those Royal Commissions have influenced the development of safety frameworks for Major Hazard Facilities and energy networks in Victoria.

This current Review is examining the safety frameworks applying to electricity and gas networks in Victoria administered by the safety regulator, Energy Safe Victoria (ESV).

While the safety regime applying to Major Hazard Facilities is outside the scope of the Review, there are some close connections in the way safety regulation in the two areas has developed in Victoria over the past two decades, particularly with the adoption of so-called “safety case” systems of regulation.

The Review was commissioned by the Minister for Energy, Environment and Climate Change in January 2017, and is required to present its Final Report by the end of 2017.

This Interim Report presents the Review's interim findings and draft recommendations. The report is provided for comment and feedback from interested groups. Submissions provided in response to the Interim Report will inform the Review's consideration of the final recommendations and findings to be presented to the Minister in December 2017. In the meantime, all material should be treated as draft only.

Approach of the Review

The Review has centred its consideration around two key questions:

- What are the characteristics of leading practice safety regulation frameworks applying to electricity and gas networks, or to other similar sectors, and how does the current Victorian safety framework compare with leading practice?
- What are the characteristics required by a highly effective safety regulator, and are there any areas in which the Victorian regulator, ESV, needs to invest greater effort?

The Review's conclusions in this Interim Report are that Victoria has many of the key elements of a leading safety regulatory system in place – but there are areas requiring attention, particularly around implementation.

The Victorian Government has initiated a major program of work to address bushfire risk, including internationally pioneering research and development, and ESV has established a national reputation for its work in leading energy safety initiatives. Nevertheless, there are several areas where improvement is required to ensure that the state maintains an internationally leading network safety system.

The Review's interim assessment has been informed by formal submissions in response to two issues papers released earlier in 2017, and meetings with a wide range of relevant organisations and individuals, including with:

- all state regulators of electricity and gas networks in Australia;
- all gas and electricity transmission and distribution businesses operating in Victoria;
- the Electrical Trades Union;
- academic experts; and
- national and state government agencies that have responsibilities with an interest in energy network safety.

To assist its consideration, the Review has commissioned reports on leading practice safety regulation for electricity and gas networks from the consulting firm Marsden Jacob, and on ESV's data capabilities from the University of Melbourne.

The Review has been greatly helped by very open and constructive engagement through a series of wide-ranging roundtable discussions with the Director of Energy Safety, his executive leadership team, and with staff of ESV. The Review has also been assisted by field inspections of facilities and infrastructure managed by AusNet Services and Powercor.

Making the case for safety: The characteristics of leading safety frameworks

International thinking around the most effective safety regulatory frameworks for hazardous industries has been heavily shaped by several major catastrophic incidents over the past four or five decades.

In Australia, and many other countries, leading practice has coalesced around a “safety case” approach, whereby regulated operators must have comprehensive systems and processes to identify and manage safety risks – and they must be able to demonstrate the effectiveness of their systems to an external regulator.

This broad approach was originally pioneered in the United Kingdom's nuclear industry in the 1960s, and was adopted more widely across the European Union from the 1980s through the EU's “Seveso directive”, named after the Italian town that was exposed to the release of highly toxic dioxin following a chemical plant explosion in 1976.

While not specifically using the term “safety case”, the original Seveso directive required the operators of certain hazardous industrial facilities in EU member states to prove they had the necessary comprehensive procedures in place to effectively manage safety.

The safety case approach was extended to the United Kingdom’s offshore oil and gas industry following the official inquiry by Lord Cullen into the Piper Alpha oil platform disaster in 1988. It was subsequently applied to offshore oil and gas production in Australia from 1996.

Victoria – and, indeed, one of ESV’s two predecessor agencies, the Office of Gas Safety – was an early adopter of the safety case approach. Safety cases were introduced as a statutory requirement for gas transmission and distribution networks in Victoria from late 1997.

The Royal Commission examining the 1998 Esso Longford Plant explosion found that the plant itself was subject to less stringent safety regulation than the safety case requirements in place both upstream and downstream of the plant. The Royal Commission recommended that the safety case approach be applied more broadly to all Major Hazard Facilities in Victoria.

Outcomes-based regulation and the capabilities required by an effective safety regulator

The safety case approach is an outcomes-based form of regulation. The overarching requirement is for regulated businesses to achieve safe *outcomes* by reducing risks as far as they can “reasonably practicably” be reduced.

Businesses must have systems and processes in place to achieve this objective. However, they retain flexibility, *provided that they can make a sufficiently compelling case to the regulator*, that the systems and processes will, in fact, reduce risks as far as reasonably practicable.

International experience has shown that the safety case approach does not provide a silver bullet. Everything depends on how well the safety case is prepared; how deeply it is embedded in the working arrangements and cultures within the organisation that is being regulated; how effectively it is implemented and updated; and how well it is regulated by the external regulator.

In a speech in June this year, Justice Haddon-Cave, who conducted a major inquiry for the British Government into the causes of a catastrophic mid-air loss of an RAF Nimrod aircraft in 2006, summarised this point clearly:

“Safety Cases and the Safety Case regime and methodology are invaluable tools in modern risk management. Safety Cases are here to stay. Properly used, they provide an invaluable intellectual and practical structure for analysing, anticipating and ameliorating risks. However, like so many ‘paper-based’ solutions, they are open to abuse and lassitude and can become a ‘comfort blanket’ to keep one warm from the chill of having to face the realities of multifarious risk.”

The approach of the regulator is fundamentally important, as highlighted by the Australian National University’s Professor Andrew Hopkins:

“Many jurisdictions around the world have fallen into the trap of thinking that all they need to do to institute a safety case regime is enact the necessary legislation. This is a serious error. Safety case regimes have only functioned well when there is a

competent, independent and well-resourced regulator. Importantly, the initial process of evaluating and accepting (or rejecting) a safety case requires a high level of expertise, if it is not to degenerate into a rubber stamp exercise.”

In Part C of this Interim Report, the key capabilities required by an effective safety regulator are identified, including:

- an appropriate degree of organisational independence – the capacity of the regulator to make objective, impartial, consistent and expert decisions without any perception of being influenced by conflict or bias, whether from regulated entities or government;
- strong analytical capabilities and reporting;
- technical expertise and understanding of the industry being regulated;
- effective tools and capabilities to achieve compliance and enforce regulatory obligations, including through rigorous audit and inspection programs;
- strong engagement with entities being regulated, including effective communication of regulatory requirements.

A substantial part of this Interim Report examines ESV's current capabilities and seeks to identify areas that require additional focus in order for ESV to be at the forefront of regulatory practice.

As outlined in further detail below, much of the work that needs to be done by ESV has been identified through ESV's own strategic planning and review processes over the past two years or so. The imperative now is to ensure that the necessary strengthening of ESV's systems and processes is implemented expeditiously and with high degrees of transparency to promote confidence in the safety framework.

The evolution of the safety framework in Victoria over the past two decades

The preparation and implementation of safety cases and associated safety management systems form the foundation of ESV's approach to network safety regulation. At the same time, the current electricity and gas network safety frameworks in Victoria also include extensive prescriptive statutory requirements, particularly in relation to electricity networks and bushfire risk.

The current *Electricity Safety Act 1998* and *Gas Safety Act 1997* were established almost exactly 20 years ago, at a time when Victoria embarked on the privatisation of electricity and gas assets. The *Gas Safety Act 1997* was passed in late 1997, and was presented to the Victorian Parliament at the time as a “light-handed” approach to regulation built around the new safety case system.

The *Electricity Safety Act 1998* was legislated in early 1998. It incorporated various prescriptive requirements, particularly relating to the management of bushfire risk through electric line clearance regulations. Consistent with the trend towards an outcomes-based approach, the Act also incorporated provision for Electricity Safety Management Schemes that could be adopted on a voluntary basis. If approved, network businesses with Electricity Safety Management Schemes would be exempt from some prescriptive requirements of the Act.

In any event, the *Electricity Safety Act 1998* has evolved through a series of amendments over the past two decades. Since 2009, Electricity Safety Management Schemes have been a compulsory requirement, operating in addition to other prescriptive requirements set out in the Act or in associated regulations under the Act.

The prescriptive elements that currently apply to the regulation of gas networks and regulation of electric networks include:

- the *Gas Safety (Gas Quality) Regulations 2007*, prescribing quality standards, requirements for gas odourisation, and requirements for testing gas quality;
- the *Electricity Safety (Electric Line Clearance) Regulations 2015*, specifying a code of practice for the management of vegetation near powerlines, and requiring electricity network businesses to submit a management plan to ESV relating to compliance with the code on an annual basis; and
- the *Electricity Safety (Bushfire Mitigation) Regulations 2013*, specifying content for bushfire mitigation plans submitted to ESV every five years for acceptance, and prescribing requirements for the inspection of overhead electric lines and supply networks and the achievement of other safety standards, including requiring the installation of fault suppression equipment in certain zone substations.

ESV's regulatory and corporate governance

The Review has considered two key aspects of governance:

- the structures and arrangements that apply to ESV's regulatory decision making – that is, its **regulatory governance framework**; and
- the structures and arrangements that apply to its organisational decision making – that is, its **corporate governance framework**.

ESV is established as an independent regulator. The *Energy Safe Victoria Act 2005* sets out the ways in which ESV is accountable to the responsible Minister – the Minister for Energy, Environment and Climate Change – and it provides mechanisms that allow the Minister to set expectations for ESV's performance and corporate direction.

The Act also provides a mechanism to allow the Minister to commission advice and inquiries into certain matters by ESV. However, the Act does not provide for the Minister to direct ESV in its regulatory decision making.

In many areas of regulation, including safety regulation, it is generally recognised that there are broad public benefits in having a regulator that operates independently, removed from political or commercial interests. The Review considers that ESV's independent status should be preserved, but that ESV's regulatory governance should be strengthened by formally constituting it as a three-person commission.

The intention is to broaden accountability for ESV's regulatory decisions and approach from a single decision maker, the Director of Energy Safety. This should promote consideration of a wider range of perspectives in regulatory decision making and lessen the pressure that may fall to one

individual when strong, independent decision making is required, free from commercial or political interests.

As a technical regulator requiring specialist skills, ESV relies on staff, including at senior decision making levels, who have previously been employed by the network companies that ESV regulates, or staff who may wish to join such companies as part of their future career development. The movement of staff has a number of benefits, including sharing knowledge to improve network safety. However, it also brings the risk of perceived and actual conflicts of interest in regulatory decision making. The Review proposes that ESV should develop stronger and more formal arrangements to manage this risk.

The Review also proposes that ESV continues to strengthen its internal governance and associated management processes and systems. External reviews commissioned by the Director of Energy Safety in late 2015 and 2016 highlighted several areas of weakness in ESV's systems and processes. Key issues requiring attention included:

- organisational drift, with ESV lacking a well-defined "organisational model";
- unbalanced spans of control;
- insufficient team based approaches;
- weaknesses in ESV's strategic foundations;
- insufficient analytical capacities; and
- a lack of a consistent basis for understanding and communicating risk within the organisation.

Following these external reviews, the Director of Energy Safety and ESV's senior management team have initiated a significant organisational reform program. Reporting structures have been rationalised, investments made in new capabilities, including strengthened analytical capabilities, and a formal Executive Management Board has been established.

While much initial progress has been made, the senior leadership of ESV has indicated to the Review that it considers that the process of organisational reform is an "evolving and continuing work".

In a very real sense ESV has been on what its senior leadership described to the Review as an "organisational journey". The relative lack of maturity in formal corporate governance and management structures that seems evident in the conclusions of some relatively recent reports may, in part, reflect the fact that ESV was originally established from technical offices that had originally been located within much larger organisations.

In a series of roundtable discussions held with the Review, the Director of Energy Safety and ESV's senior leadership team engaged openly and constructively to identify key areas where further work was required to strengthen ESV's processes and capabilities. An open and transparent approach will greatly assist in boosting internal and external confidence in the steps being taken to improve the quality and maturity of ESV's corporate governance and management arrangements.

Summary of draft recommendations: ESV's governance

Draft recommendations proposed by the Review include:

- establishing ESV as a three-person commission, with a full-time chair and two part-time members (Draft Recommendation 1);
- the development of greater guidance and strengthened formal protocols around regulatory decision making by ESV in circumstances where there may be potential or perceived conflicts of interest, particularly in relation to staff who may previously have been employed by regulated network businesses (Draft Recommendation 3); and
- implementation of a workforce strategy to attract and retain high performing staff, and promote workforce diversity, including increased gender diversity (Draft Recommendation 5).

Strengthening ESV's network safety regulation capabilities

The Review has set out to evaluate ESV's capabilities as a leading safety regulator, recognising its established strengths and identifying areas that could be strengthened further.

It is perhaps inevitable that most focus is placed on those capabilities that the Review considers should be strengthened. However, the assessment should be viewed in the context of a regulator that has established a reputation as a national leader, and an organisation that is actively seeking to identify ways in which it can improve its effectiveness.

All the same, it is apparent that ESV has further work to do to before it can justifiably claim to be at the very forefront of regulatory practice.

ESV's most recent Corporate Plan, which was prepared during the course of the Review's initial work, sets out the objective of substantially strengthening its regulatory capabilities. If anything, the Review's examination of ESV's systems and processes has reinforced the importance of the work ESV has identified that it needs to do.

As noted earlier, when the safety case approach was first introduced through the *Gas Safety Act* in 1997 it was presented as a form of "light handed" regulation. Even though international practice over the past two decades has seen increasing adoption of the safety case approach, experience has demonstrated that a robust safety case system requires strong "hands on" engagement by the regulator. Rigorous and highly active audit and inspection programs sit at the very heart of an effective safety case system.

Consistent with the broad directions set out in ESV's most recent Corporate Plan, there needs to be a substantial increase in ESV's inspection and audit activity. More inspectors need to be out in the field and they need to be administering an expanded audit program that strongly implements the ESV goal to "test, challenge and expose".

Behind the scenes ESV needs to develop significantly stronger analytical capabilities. Good progress has recently been made in developing more robust approaches to collecting and managing data, but much more needs to be done.

The Victorian Bushfires Royal Commission (VBRC) highlighted the importance of ESV developing stronger analytical capacities to determine whether safety risks were improving or deteriorating. ESV still has more to do before it has the required capabilities in place. At this stage, ESV does not

have the data analysis capabilities to make statistically robust judgements around changes in the level of bushfire risk. Addressing this gap should be a high priority. Similarly, there needs to be investment in developing more mature, integrated surveillance systems to inform compliance activities and target audit and inspection programs.

ESV has established a broad reputation for working constructively with the businesses that it regulates. The Review sees this as a strength that should be maintained. However, in maintaining this strength, ESV has been less effective in developing a similar external reputation for being prepared to take stronger compliance actions.

In its most recent Corporate Plan, ESV has signalled an intention to refine its “responsive regulation approach” and adopt a more robust approach to “serious non-compliances”. The Review considers this to be a high priority – ESV needs to have the approach of a confident and independent regulator that is prepared to take strong action when required, grounded in law.

As part of this, ESV needs to maintain the capabilities necessary to successfully launch stronger actions, including prosecutions, if they become necessary. Maintaining such capabilities is a challenge for any small to medium-sized regulator like ESV, particularly when there may only be the occasional need for such action. Consequently, having standing arrangements in place to be able to effectively harness outside expertise and assistance is critical.

In 2015 and 2016, ESV commissioned external advice on its regulatory practices from the consulting firm Advisian. In addition to identifying the need for ESV to develop deeper analytical capabilities and an integrated surveillance approach, Advisian recommended the development of strengthened strategic regulatory capabilities more generally. It also recommended the greater adoption of well-developed formal guidance, both internally for ESV itself, and externally to assist businesses to better meet ESV's safety case requirements. It emphasised, moreover, the need for quality management systems to support team decision making.

The recommendations of the Advisian reports provide a useful reference point for the changes that ESV needs to make to strengthen its regulatory systems and approach.

The Review has also considered the regulatory tools that ESV has available to it under the relevant safety legislation. ESV currently has most of the tools necessary to facilitate a graduated approach to compliance and enforcement, allowing ESV to adopt “lighter touch” measures when this is appropriate, but to escalate to stronger interventions in the case of more serious noncompliance. However, the Review has identified that ESV does not have some tools that are available to similar regulators, including the capacity to enter into enforceable undertakings and secure adverse publicity orders and injunctions.

In addition, there would also be scope to further refine and improve ESV's regulatory tools, including making their application more consistent across electricity and gas networks, and removing unnecessary limitations on their use.

Finally, some of the penalties for serious breaches of safety responsibilities available to ESV are significantly lower than for other safety regulators. Penalties should be reviewed with a view to bringing them into greater alignment with the penalties applying under other leading safety frameworks.

Summary of draft recommendations: Compliance and enforcement

Draft recommendations proposed by the Review include:

- a substantial increase in ESV's audit and inspection resources and activity in accordance with the directions set out in ESV's *Corporate Plan 2017–2020*, and with strong and transparent reporting of ESV's performance (Draft Recommendation 6);
- the implementation by ESV of a more robust approach to compliance and enforcement and the preparation of an updated *Charter of Consultation and Regulatory Practice and Compliance and Enforcement Policy*, to reflect this change (Draft Recommendation 9);
- an expansion in the range of regulatory tools available to ESV, including a capacity to enter into enforceable undertakings and seek injunctions and adverse publicity orders (Draft Recommendation 12); and
- a review of penalties, with a view to increasing penalties to bring them into greater alignment with other leading safety regimes (Draft Recommendation 13).

Summary of draft recommendations: Strategic and analytical capabilities

Draft recommendations proposed by the Review include:

- the development by ESV of an action plan to strengthen its analytical capabilities and processes, including to support an integrated surveillance approach (Draft Recommendation 8); and
- a mature data analytics capability, including the data collection and management systems to support robust statistical analysis, should form a central component of ESV's integrated plan to strengthen its analytical capabilities. Consistent with the approach to the overall action plan, clear milestones should be developed to promote accountability (Draft Recommendation 14).

The balance between statutory prescription and outcomes-based regulation

The current electricity and gas network safety framework in Victoria could be best described as an outcomes-based system built around requirements for safety cases and safety management systems and augmented by extensive statutory prescriptive requirements, particularly in relation to bushfire risk associated with electricity networks. In short, it is a hybrid mix of outcomes-based and prescriptive regulation.

In reviewing a safety regulatory framework that incorporates prescriptive statutory elements within an outcomes-based safety case framework it is natural to ask whether there should be more

statutory prescription or less statutory prescription. Submissions to the Review have presented mixed views on this question.

At a very broad level, and at the risk of overgeneralising, major network operators have argued in favour of less prescription, while submissions from the Electrical Trades Union and the South East Community Forum have suggested there should be more prescription and greater policing by the regulator, ESV.

The case for less prescription revolves around its greater flexibility, including its greater capacity to adapt in the face of changing technology. If operators are given greater freedom to find the most efficient way of reducing risk, the argument goes, it could be expected that they will do so. And, all other things being equal, energy consumers – the Victorian community – would benefit from lower energy prices, or smaller increases in energy prices. Evidence has been presented to the Review of cases where prescriptive requirements introduced in response to recommendations of the Victorian Bushfires Royal Commission (most notably, some aspects of the requirements around the use of vibration dampeners on electricity lines) have led to greater network costs without a material improvement in safety.

On the other hand, the case for maintaining, or even raising, the existing degree of prescription rests on concerns that economic incentives alone will not be sufficient for network operators to achieve the level of safety desired by the Victorian community. Following this line of reasoning, it may be argued that there needs to be clear and unambiguous standards set by the government and these should be strongly enforced by the safety regulator.

Carefully weighing up the competing arguments, and informed by the broader literature on safety regulation, the Review considers that a longer-term aspiration to reduce the level of statutory prescription, and place greater reliance on the safety case approach, would be in the best interests of Victorian energy consumers.

However, the Review does not propose that there should be a significant change in the broad balance of prescriptive statutory requirements at this time.

This is because a major shift towards a greater reliance on the outcomes-based safety case approach should only occur when there can be deep confidence in the capabilities and capacity of the regulator to strongly enforce such a system. International experience has clearly shown that such a system relies on a highly active and engaged regulator implementing a visible, and rigorous, program of audits and inspections.

In addition, network businesses would need to demonstrate a sustained track record of producing rigorous safety cases. Strong safety cases and safety management systems must be based on strong technical standards and disciplined internal operating procedures. There may be less external prescription set out in legislation or legislative instruments, but if anything, there is likely to be a need for *more* internal prescription within network businesses.

From the Review's engagement with other network safety regulators in Australia, it is clear that ESV enjoys a reputation as a leading network safety regulator in Australia, perhaps as the leading regulator. Even so, there is much scope for ESV to strengthen its systems, processes, and governance.

This process needs to be completed before consideration should be given to significantly changing the degree of prescription set out in current legislation. Network businesses, similarly, need to build deep confidence in the quality of their systems. Strong leadership, and deep engagement, from the board and chief executive levels down, is essential.

Engagement with other regulators and government agencies

There are extensive areas of interaction between the network safety responsibilities of ESV and the responsibilities of other national and state regulators. Confronting such an extensive web of regulatory relationships it could be asked whether there may be a case to substantially rationalise roles and responsibilities.

Proper consideration of the question of whether safety regulation across several Victorian regulatory agencies should be brought together under a single organisation or communities of practice would require a broader review. However, there could be benefits in such an approach, particularly in reaping the benefits of greater scale and fostering the development of deeper capabilities in key dimensions, such as legal and analytical functions.

Within the scope of this current review of electricity and gas network safety, the central issues relate to effectiveness of the arrangements ESV has in place to manage functions that overlap or interact closely with other regulators or other government departments and agencies.

ESV has endeavoured to place its key regulatory and operational relationships on solid foundations through a system of formal Memoranda of Understanding (MOU). It has a number of MOUs or similar agreements in place, spanning other Victorian regulators, national energy regulators, emergency services and Victorian government departments.

The arrangements that ESV has implemented are generally working effectively. ESV has a reputation for working well with other agencies and it is respected for its expertise in electricity and gas safety. Nevertheless, strong institutional relationships always benefit from regular ongoing maintenance and review. The Review proposes that ESV should implement a more formal process of review to ensure that its various MOUs and similar agreements are up-to-date and working relationships remain sound. Several of ESV's current MOUs are out of date or have technically expired, and there are some gaps that should be addressed.

Relationship between ESV and DELWP

The relationship that ESV has with the Department of Environment, Land, Water and Planning (DELWP) is particularly important. Several submissions to the Review have expressed some concern around a perceived lack of clarity in the respective responsibilities of the department and ESV.

The relationship between the ESV and DELWP goes beyond the traditional policy department–regulatory agency dichotomy. This is because DELWP has specific regulatory responsibilities that overlap with ESV, particularly in relation to planning involving gas transmission pipelines. In addition, DELWP has been very actively involved in delivering bushfire safety programs and developing further regulatory interventions in recent years, and this may have contributed to external perceptions of a blurring of responsibilities between the department and ESV.

Irrespective of the causes, the Review proposes that DELWP and ESV should develop a Memorandum of Understanding that sets out their respective roles and responsibilities in the areas of electricity and gas safety. ESV maintains an MOU on its website that covers matters relating to the regulation of gas transmission pipelines. However, the MOU is with the former Department of Primary Industries and dates back to 2007.

At a broad level, a newly developed MOU should recognise:

- DELWP's role in developing policy and advising the Minister for Energy, Environment and Climate Change on energy policy matters;
- ESV's role as the regulator of electricity and gas safety;
- DELWP's roles in relation to planning and environmental regulation.

The arrangements should recognise, and help preserve, ESV's independence in regulatory decision making, and the department's role as the principal source of policy advice to the Minister for Energy, Environment and Climate Change.

Relationship between ESV and the Essential Services Commission

As part of the licensing regime for the energy network businesses, the Essential Services Commission (ESC) administers and enforces both the *Electricity Distribution Code* and *Gas Distribution Code*. These codes regulate how electricity and gas distributors operate their networks in a safe, efficient and reliable manner. They include prescribed obligations regarding the quality and reliability of electricity and gas supply, both of which have safety implications for consumers and the community more generally.

Several submissions to the Review have raised concerns around inconsistencies between new safety regulatory obligations applying to electricity distribution businesses, administered by ESV, and obligations under the distribution code administered by ESC. There are also some general concerns around ESC's limited technical capabilities in the area of network operations.

Any potential or actual inconsistencies in the regulatory requirements applying to distribution companies should be addressed as a matter of high priority. The planned review of the *Electricity Distribution Code's* voltage standards should be completed by ESC as soon as practicable.

The ESC has indicated that it will be reviewing the distribution codes more broadly. In its review, the ESC should consider a number of options relating to the technical components within the codes. In particular, a review of the codes should clearly define the technical elements of the electricity and gas distribution codes, and consider the role that ESV could play in the compliance and enforcement of the technical elements.

Relationship with emergency services agencies

ESV has particularly important responsibilities in the event of emergencies that might be caused by, or might affect, electricity and gas networks. Strong protocols are necessary to ensure that operational responsibilities are well understood and that emergency services can access the information they require as quickly and efficiently as possible. ESV has critical roles to play in assisting emergency services agencies to plan for major incidents, as well as to respond to incidents when they occur.

ESV's current emergency services handbook relates to electricity hazards and safety only and it was last updated in 2008. Having been in place for almost a decade, it would now be timely for ESV to review the handbook in consultation with the relevant emergency services agencies to ensure that it is current and meets the needs of emergency services.

The Review is also proposing that ESV should develop a similar hazards and safety handbook for the gas networks that it regulates.

Summary of draft recommendations: Engagement with other regulators and government agencies

Draft recommendations proposed by the Review include:

- ESV's memoranda of understanding with other regulators and government departments and agencies should be reviewed annually to ensure they remain current and fit-for-purpose (Draft Recommendation 16);
- the ESC should complete its review of the voltage variation standards under the *Electricity Distribution Code* as soon as practicable. A broader review by the ESC of the *Electricity Distribution Code* and the *Gas Distribution Code* should consider the role of ESV in promoting and enforcing compliance with technical standards under the codes (Draft Recommendation 18);
- ESV and DELWP should jointly develop an MOU to help manage their respective responsibilities, with:
 - the MOU recognising DELWP's role in planning and environmental matters and as the principal source of policy advice to the Minister; and
 - with the MOU recognising and facilitating ESV's independence in regulatory decision making. (Draft Recommendation 17)
- the *Electricity Hazards & Safety Handbook for Emergency Service Personnel* should be updated and a new Gas Hazards and Safety Handbook should be prepared for emergency services. Formal MOUs should be developed by ESV with each of the relevant emergency services agencies (Draft Recommendation 19).

Integrating safety regulation with economic regulation

The Terms of Reference for the Review require consideration of the relationship between the economic and safety regulatory regimes. These two systems overlap significantly, but have different points of focus. In very broad terms:

- the economic regulatory system seeks to ensure that energy is distributed as efficiently as possible at the lowest possible cost to consumers; and
- the safety regulatory system seeks to ensure that energy is distributed safely with risks to the community reduced to as low as reasonably practicable.

There will always be the potential for tension between the two systems. If economic regulation attempts to reduce revenues too zealously, the community may be exposed to excessive risk. At the same time, if safety regulation is not carefully designed it may result in excessive costs to consumers.

Within current frameworks, the key to resolving these tensions productively is an effective relationship between the Australian Energy Regulator (AER) and ESV, as the Victorian network safety regulator.

The *National Electricity Rules* and *National Gas Rules* require the AER to take safety requirements into account in its pricing determinations. To be able to do this effectively, ESV needs to be equipped to act as an authoritative advisor to the AER, having the capacity to advise on safety requirements while also maintaining an appreciation of the need for efficiency and cost effectiveness.

Several submissions to the Review have indicated that the relationship between AER and ESV is generally working well, although some submissions suggested that ESV could play a more active role in facilitating the AER's consideration of safety-related funding needs.

The Review is proposing two draft recommendations that relate to the relationship between ESV and the AER. The first recommendation is intended to ensure that the relationship between the two regulators is periodically evaluated, and this is done in a structured way that is transparent. The Review considers that the relationship between the two regulators is of such importance that an annual review is warranted, including to ensure that any concerns or weaknesses that may emerge are identified and addressed expeditiously.

It is evident from submissions to the Review that there remains confusion among some stakeholders around how safety is factored into economic regulatory decisions by the AER. This is compounded by concerns that the safety-related programs that are factored into the AER's decision making processes may not be delivered in a timely fashion by regulated businesses, or, in some cases, may not be delivered at all. When this occurs, questions may naturally arise as to whether Victorian energy consumers have, in effect, been required to pay higher prices without promised safety benefits being delivered.

The Review is not proposing fundamental changes to the system of economic regulation, which, in any case, would raise complex issues beyond the Terms of Reference. Nevertheless, the Review is proposing that the integration of the economic and safety systems should be reinforced through greater transparency and accountability around the delivery of safety-related programs. Ultimately, the regulatory responsibility for ensuring that safety commitments are satisfactorily met by regulated businesses should rest with ESV as the safety regulator.

In relation to gas supply specifically, the Review is also proposing draft recommendations aimed at strengthening coordinated planning and the development of a clear reliability standard. This responds in part to concerns expressed by the Australian Energy Market Operator that the economic regulatory system is not sufficiently facilitating new investments in gas pipeline infrastructure. Without timely investments, there may be a deterioration in the reliability of supply to gas consumers.

Summary of draft recommendations: Integrating safety regulation with economic regulation

Draft recommendations proposed by the Review include:

- strengthening the working arrangements between ESV and the AER (Draft Recommendation 20);
- the development of better protocols to facilitate more effective engagement between ESV and regulated network businesses as an input into pricing review processes conducted by the AER (Draft Recommendation 21);
- strengthened transparency around the implementation of safety programs by network operators that have been accepted by the AER in its pricing decisions, including through progress reporting by ESV in its annual network safety performance reports (Draft Recommendation 22); and
- improved arrangements to plan for future expansion in gas networks and to ensure that necessary investments to maintain reliability are recognised in economic regulatory decision making (Draft Recommendations 23 and 24).

Engaging the workforce

Organisations that are at the forefront of safety management make sure that safety is deeply embedded in their organisational cultures. It becomes part of what they “live and breathe” each day.

Strong workforce engagement is an important part of achieving this culture. Employees need to embrace a safety-first approach and they must be actively engaged in identifying and resolving safety risks.

From a regulatory perspective, the regulator’s task is to ensure that regulated businesses have the systems and processes – and the engagement mechanisms – to promote a strong safety culture. The regulator may also be able to use its “convening power” to bring together different groups to develop and share best practice models.

Frontline workers maintaining gas and electricity networks can be a valuable source of advice on risks, including the broader risks to the community. They are working on the networks every day and can see where problems are emerging.

There are some examples of effective workforce engagement to promote safety, including the non-profit *Step Change in Safety Organisation* that operates in the United Kingdom to promote safety in the offshore oil industry. This initiative brings together operators, contractors, trade unions, regulators and the workforce, all working together to promote safety. The United Kingdom regulator, Health and Safety Executive (HSE) is actively engaged.

There are also several examples of industry-led initiatives to promote safety cultures in other sectors, and states, including the *Safer Together* initiative in the natural gas sector in Queensland.

None of the many workforce engagement models adopted in other countries or industries may be precisely appropriate for electricity and gas networks in Victoria. Nevertheless, each may offer some approaches that, suitably adapted, could be adopted in Victoria.

The Review considers that ESV should take a leadership role in promoting active workforce engagement in network safety. As a first step, a formal committee should be established under Section 8 of the *Energy Safe Victoria Act 2005* to provide advice to ESV and to contribute to the development of a broader workforce engagement agenda.

Summary of draft recommendations: Workforce engagement

The Review proposes that ESV should establish a consultative committee under Section 8 of the *Energy Safe Victoria Act 2005* (Draft Recommendation 25). This committee should:

- provide advice to ESV to assist in its consideration of workforce engagement issues;
- contribute to the development of broader workforce engagement strategies, including the sharing of best practices; and
- be comprised of representatives from network operators, major contractors, trade unions, WorkSafe Victoria and the workforce.

Programs to reduce bushfire risk in Victoria

A major focus for the Victorian electricity network safety framework in recent years has been the implementation of measures in response to the recommendations of the VBRC. This has included investments in research and development, infrastructure replacement programs, and the introduction of new regulations.

The VBRC recommended a suite of measures designed to reduce bushfire risk. Recommendation 27 proposed that the government amend the regulations under the *Electricity Safety Act 1998* to progressively replace all single wire earth return (SWER) and 22 kV powerlines with new technologies to reduce bushfire risk. The VBRC also recommended that an expert taskforce be established to advise on the best means of achieving the intent of this recommendation.

The subsequent Powerline Bushfire Safety Taskforce (the Taskforce) reported in September 2011. The Taskforce was comprised of an independent chair, Mr Tim Orton, and a panel of expert members. The Taskforce recommended that the risk of powerlines starting bushfires could be reduced by:

- installing fault suppression equipment known as Rapid Earth Fault Current Limiters (REFCLs) on select 22 kV powerlines to reduce the risk of polyphase powerlines starting fires by automatically reducing the electric current in some types of powerline faults;

- installing remotely controlled Automatic Circuit Reclosers (ACRs) on SWER lines to reduce the risk of SWER lines starting fires by enabling the devices to be set remotely so that they turn off those powerlines quickly when faults occur; and
- putting powerlines underground or insulating conductors in the areas of highest bushfire risk.

The Taskforce also indicated the need for further research and development – noting that REFCLs had not previously been used for bushfire suppression.

In December 2011, the Victorian Government accepted the Taskforce's recommendations, and established the Powerline Bushfire Safety Program (PBSP) to implement the response to the recommendations.

The Program is now overseen by DELWP and is on track to achieve its key objectives:

- powerline replacement works are now well advanced – over 500 kilometres of bare-wire powerlines have been replaced with safer alternatives in high bushfire risk areas and all works are scheduled to be completed, ahead of time, by the end of 2019;
- several key regulatory initiatives have been implemented – around 1,600 ACRs have been installed on single wire earth return lines to minimise fire risk on Total Fire Ban days; REFCL fault detection and suppression capabilities are being deployed; and
- the \$10 million research and development program has been largely delivered, with the final projects scheduled for completion over the next two years.

The most complex element of the PBSP involves implementing fault detection and suppression technology on polyphase 22 kV powerlines. The Victorian Government has mandated new standards that will require this new equipment to be installed in 45 zone substations that distribute electricity in high bushfire risk parts of the state.

In practice, the only equipment that will currently allow the standards to be met is a REFCL system currently supplied by a single company based in Sweden. This equipment rapidly limits the energy released when an electrical fault occurs on a powerline. A REFCL can reduce the fault current to very low levels within a few hundredths of a second on an affected circuit while, at the same time, maintaining supply by increasing voltage on the unaffected circuits.

The use of REFCL technology to reduce bushfire risk is being adopted for the first time in Victoria following successful field trials in partnership with distribution businesses, funded through the PBSP's research and development program. Although REFCLs have been used in Europe since the early 1990s to improve supply reliability, they have never previously been used for fire safety measures.

The REFCL program is technically challenging and considerable works are required to support the implementation of units in zone substations. This includes extensive "network hardening" to manage voltage rises that can occur when REFCLs are triggered, and re-engineering of network operations.

A regulatory impact assessment was prepared before the new fault suppression standards that effectively require REFCLs to be mandated through the *Electricity Safety (Bushfire Mitigation)*

Regulations 2013. This assessment was prepared by the consulting firm, ACIL Allen, and incorporated a detailed cost-benefit analysis indicating that the estimated costs of deploying REFCLs would be more than outweighed by the reliability and bushfire risk reduction benefits.

More recent experience has shown that the costs of deploying REFCLs will be considerably higher than originally estimated by distribution businesses. The best currently available information on these costs comes from the Australian Energy Regulator's decision on project funding determinations for the initial phase of REFCL installations by AusNet Services and Powercor. Extrapolating the current estimated costs, the deployment of REFCLs would now have higher estimated costs than estimated benefits, assuming no changes in any of the other elements of the ACIL Allen methodology. A more complete analysis would be required to fully determine the best estimated cost-benefit ratio at this time.

Given the best information currently available indicates that the deployment of REFCLs would have substantially higher estimated costs, the Review's judgement is that a measured approach should be adopted – allowing policy settings to be carefully considered with the benefit of greater experience and information.

In particular, the Review proposes that the deployment of REFCL technology to satisfy the *Electricity Safety Act 1998* and the *Electricity Safety (Bushfire Mitigation) Regulations 2013* be subject to review prior to each tranche by an independent expert panel appointed by the Minister, with the first report to be provided once further experience has been gathered with the roll-out of the first tranche. The panel should draw on advice and input from the Powerline Bushfire Safety Committee that has been established by ESV.

The panel should report to the Minister for Energy, Environment and Climate Change. The evaluation reports should help inform ongoing consideration of policy settings, allowing any changes that may be considered necessary to be made on the basis of comprehensive information from further experience.

It will also be important that ESV continues to work closely with distribution businesses, and with the assistance of the Powerline Bushfire Safety Committee, to provide timely advice to the Minister for Energy, Environment and Climate Change on the need for any exemptions from the *Electricity Safety (Bushfire Mitigation) Regulations 2013*.

In the meantime, there is an urgent need for the *Electricity Distribution Code* that applies to electricity distribution businesses to be reviewed. A number of submissions to the Review raised concerns that the requirements of the *Electricity Safety (Bushfire Mitigation) Regulations 2013*, which effectively mandate the adoption of REFCLs, will cause them to breach some of the provisions of the *Electricity Distribution Code*.

The potential inconsistency between the regulatory requirements arises because the operation of a REFCL following a single-phase fault leads to an increase in voltage levels at the point of supply to high voltage customers, which exceeds the permissible level as currently specified in Clause 4.2.2 of the *Electricity Distribution Code*. The Essential Service Commission has committed to a review of the relevant parts of the Code to ensure it is compliant with the bushfire mitigation regulations.

Future research and development

The \$10 million in funding for research and development provided through the PBSP has helped drive innovations that have placed Victoria at the forefront of new approaches to the management of bushfire risk. With this Program now largely complete, it is timely to ask whether there is a case for continued research and development funding by the Victorian Government.

There are several relevant considerations to take into account, including:

- Is there scope for further technological innovation to address bushfire risk?
- Would further research and development have a sufficient public good component to warrant government funding?
- What arrangements should be considered to maximise involvement from distribution businesses?

The information that has been provided to the Review indicates that the potential for technical innovation to achieve greater safety has not been exhausted. Moreover, research in this area is likely to involve clear public good dimensions that would justify government funding.

It is, however, very difficult to be definitive in any way as to how much funding might be justified, at least given the available information. As a broad judgement, the Review would suggest a modest program of around \$1 million per annum may be sufficient to continue focused areas of research, including through university researchers. If such a program were to be maintained, it should be undertaken jointly with distribution companies, and on the basis that government funding would be more than matched by contributions from distribution companies. This research and development fund should be technology neutral to allow the entry of emergent technologies in the future or to facilitate improvements to existing technologies.

Summary of draft recommendations: Bushfire safety programs

Draft recommendations proposed by the Review include:

- the deployment of REFCL technology to satisfy the *Electricity Safety (Bushfire Mitigation) Regulations 2013* should be subject to evaluation and review by an independent expert panel appointed by Minister for Energy, Environment and Climate Change (Draft Recommendation 27);
- ESV should continue to work closely with distribution businesses, and with the assistance of the Powerline Bushfire Safety Committee, provide timely advice to the Minister for Energy, Environment and Climate Change on the need for any exemptions from the performance standards contained in the *Electricity Safety (Bushfire Mitigation) Regulations 2013* (Draft Recommendation 28); and
- the Victorian Government should consider providing ongoing funding for further research and development into new technology to manage the bushfire risk from electric lines, with:
 - any government funding to be contingent on being at least matched by contributions

from distribution companies; and

- the research and development program being managed jointly with distribution companies. (Draft Recommendation 29)

Regulating underground assets

The Review has given particular consideration to the issues around the safety regulation of underground assets, both electricity lines and gas transmission and distribution pipelines.

There are several questions of interest, including:

- Do network companies have strong systems in place to make sure their underground assets are properly designated (for instance, through clear signage) to minimise the risk of accidental contact being made by third parties (for example, contractors undertaking excavation works) and does ESV provide effective regulation?
- Does the planning system effectively minimise potential sensitive use developments around high-risk underground assets, particularly high pressure gas transmission lines?

It is evident from the submissions to the Review that gas network companies see third party interference as a significant source of risk. An important part of the system for managing this risk is the *Dial Before You Dig* service. This “one-call” service allows individuals and businesses that might be planning excavation works to receive information about the underground assets that may be in the vicinity of their proposed activity.

The *Dial Before You Dig* service operates on a voluntary basis in Victoria. However, use of the service has been a mandatory legal obligation in New South Wales since 2010. Several submissions have advocated that Victoria should adopt a similar approach.

Given the continuing level of third party damage to underground assets, the Review supports this approach, contingent on a positive regulation impact assessment confirming that the expected benefits of the approach would outweigh the additional costs.

In addition, the Review supports consideration of initiatives to strengthen planning processes around future developments that might be proposed in close vicinity to high pressure gas pipelines. In its submission, AEMO has raised concerns about developments that have been allowed close to high pressure pipelines and the longer-term risks that may be involved.

The final report of the Major Hazard Facility Advisory Committee established in 2015 included recommendations to review land use around high pressure pipelines, to provide a vehicle for the management of the emerging risks within the planning system. This would include establishing a formal advisory committee under the *Planning and Environment Act 1987*, providing a more formal status to the current *Land Development Around Pipelines Working Group*.

Summary of draft recommendations: Regulating underground assets

Draft recommendations proposed by the Review include:

- formalising membership and operation of the *Land Development Around Pipelines Working Group* and tasking the working group with providing advice to government to improve planning around high pressure gas pipelines (Draft Recommendation 30); and
- *Dial Before You Dig* should be made mandatory in Victoria following the approach that has been adopted in New South Wales, subject to the completion of a positive regulation impact assessment (Draft Recommendation 31).

Regulating the networks of the future

Energy networks in Victoria are facing transformational change over coming decades with new forms of generation, storage and distribution. Indeed, the transformation of networks has already commenced, particularly with the widespread adoption of smaller-scale solar electricity generation, including roof-top solar, and the increasing use of battery storage.

The transition to a new energy future will raise new safety risks that need to be managed. At a very broad level, there are two key challenges for the network safety framework:

- firstly, that new emerging safety risks are not properly identified and managed through appropriate regulatory responses; and
- secondly, the adoption of new technology is delayed, or unnecessary costs are added, because the regulatory system has failed to identify emerging risks and efficient regulatory responses sufficiently early.

In both case, ESV and network businesses need to stay “ahead of the curve”, working together closely to identify emerging issues and develop effective responses.

The energy network industry is already highly engaged in preparing for change, and has been active in mapping out the emerging challenges and opportunities, including through *Gas Vision 2050* and the *Electricity Network Transformation Roadmap* developed by Energy Networks Australia and CSIRO.

At the same time, ESV has been active in horizon-scanning and identifying emerging issues and challenges as they relate to network safety specifically, including through a major commissioned report in 2016, *Potential Impacts of New Energy*. This report identified a number of emerging risks, including:

- increased risks of shocks to linesmen due to back energisation of the grid from residential-based solar PV systems;
- voltage regulation and control pressures, requiring changes to current practices to avoid over or under-voltage conditions that could present potential hazards to personnel and equipment;
- potential degradation in power quality arising from the increased number of inverters on the network, potentially leading to equipment malfunctions, failures and fires;

- risks arising from poor installation practices, with some poor quality installations already causing safety problems in solar PV installations; and
- risks arising from poor maintenance practices – new technologies are likely to require maintenance activities that householders are often not equipped to identify and undertake.

To assist in developing effective regulatory responses, the Review proposes that ESV should establish a formal advisory committee under Section 8 of the *Energy Safe Victoria Act 2005*. The committee would comprise members with relevant experience and expertise in energy networks and renewable energy generation, and an understanding of the future challenges arising from a changing energy sector.

The development of a roadmap that clearly sets out what actions ESV needs to undertake to effectively respond to the emergence of new networks and the introduction of new technologies, would also assist ESV to be ready to meet the likely challenges. Regular reporting would also help inform stakeholders, including potential new entrants to the energy market, about emerging issues and the regulatory responses that may be required.

ESV should also maintain a national leadership role in considering regulatory responses to new technologies and network structures through the relevant national bodies, the Electrical Regulatory Authorities Council and the Gas Technical Regulators Committee.

Summary of draft recommendations: Regulating the networks of the future

The Review proposes two draft recommendations:

- establishment of an expert advisory committee under Section 8 of the *Energy Safe Victoria Act 2005*, including members with expertise in energy networks and renewable energy (Draft Recommendation 32); and
- development of a roadmap by ESV that identifies emerging issues from new technologies and network structures and proposed actions in response, with annual reporting on progress (Draft Recommendation 33).

Strengthening the foundations for the future

The electricity and gas safety framework has evolved over the past 20 years. The advent of privatisation saw dedicated regulators established for the two sectors, each operating under sector-specific safety legislation.

In 2005 the Office of the Chief Electrical Inspector was merged with the Office of Gas Safety to create ESV under a dedicated *Energy Safe Victoria Act 2005*. ESV has subsequently become the largest electricity and gas safety regulator in Australia.

As noted earlier, ESV has embarked on a program of internal reform over the past two years or so, and its most recent Corporate Plan, published a few months ago, sets out a blueprint to strengthen its capabilities and its approach to regulation. It is critical that the vision of ESV operating as a confident, well-resourced, and strongly independent regulator is realised.

The Review has proposed draft recommendations that would provide strong foundations for the evolution of ESV as a leading network safety regulator and to allow Victoria to better manage the transition to new energy systems.

A further aspiration is to create a pathway that would allow greater emphasis on safety case based regulation, focused on achieving strong safety outcomes for the Victorian community, with less reliance on the statutory prescription of rules and standards. This approach would help foster the most cost-effective approaches to achieving high safety standards, reducing cost pressures on consumers over time.

At the heart of the Review's draft recommendations are proposed measures to strengthen ESV's regulatory and corporate governance.

The Director of Energy Safety and ESV's senior leadership team have, as noted earlier, made important recent progress in establishing a formal Executive Management Board and bringing greater collective approaches to the administration of ESV's network safety regulation. This direction should be consolidated by establishing ESV as a multi-person commission operating under consolidated energy safety legislation. The Review proposes that the *Energy Safe Victoria Act 2005*, the *Electricity Safety Act 1998*, the *Gas Safety Act 1997* and the safety elements of the *Pipelines Act 2005* should be consolidated and the provisions applying to the electricity and gas sectors be aligned as far as possible. The consolidated Act should provide the foundations of a strong safety case based approach to network regulation.

The existing statutory prescriptive requirements should be maintained under the new consolidated Act. This includes the regulations relating to electric line clearance and bushfire mitigation plans.

Following the establishment of ESV as a commission, the capacity of the Minister under recently introduced civil penalty provisions to commence proceedings should be removed. The current legislation allows civil penalty proceedings to be initiated by either ESV or the Minister. This means that there are now potentially two regulatory decision makers: ESV itself and the Minister, supported by departmental advice. This arrangement has the potential to blur regulatory accountabilities over time. Establishing ESV as a commission, with the additional more formal regulatory governance that this model entails, should provide the necessary confidence for the enforcement of the civil penalties regime to be fully assigned to ESV as the independent regulator.

Looking further ahead, the prescriptive elements established under current regulations administered by ESV should be subject to a future review, with a view to identifying areas where the current degree of statutory prescription could be reduced. This should occur only after the new Act has been in operation for some time.

It is not possible to be definitive on a precise timeframe, but roughly four to five years would seem appropriate. As a basic condition, ESV and the network operators it is regulating would need to demonstrate the strong management of safety risk under an outcomes-based safety case framework. This would allow policy makers to consider any changes to the prescriptive degree of statutory regulation, confident in the knowledge that safety of the Victorian community was properly assured.

As an immediate priority, ESV should develop and implement a far more active audit and inspections program as outlined in its *Corporate Plan 2017–2020*. A rigorous program of audit and inspections should be supported by substantially strengthened analytical and integrated

intelligence capabilities. ESV should ensure that it has the capabilities to effectively implement the more robust approach addressing serious non-compliance foreshadowed in its *Corporate Plan 2017–2020*.

Finally, the Review proposes that the new consolidated safety Act should include a provision for ESV to be reviewed by an independent expert panel every five years. A similar provision applies to the national offshore safety regulator, NOPSEMA. The safety of Victorians depends on the quality of the network safety framework, and periodic reviews would help ensure that Victoria is at the forefront of effective regulation.

Summary of draft recommendations: Establishing strong foundations for future network safety regulation

Draft recommendations proposed by the Review include:

- all energy safety legislation should be consolidated in a single new energy safety Act (Draft Recommendation 34);
- general safety duties within the new consolidated energy safety legislation should be based around a consistent application of the principle that risks should be reduced as far as “reasonably practicable” aligning with the precaution-based approach under the *Occupational Health and Safety Act 2004* (Draft Recommendation 35);
- the full responsibility for administering the civil penalty provisions applying to electricity network businesses should be assigned to ESV when it is established as a commission under the new consolidated safety legislation (Draft Recommendation 39);
- the consolidated safety legislation should provide consistent foundations for the safety case regime in the regulation of electricity and gas network safety (Draft Recommendation 37); and
- further improvements should be made to ensure the effective operation of safety cases, including stronger guidance from ESV to assist businesses in the preparation of safety cases (Draft Recommendation 42).

Recommendations

ESV's Regulatory and Corporate Governance

Draft Recommendation 1

Energy Safe Victoria should be established as a commission with three commissioners. One commissioner should serve as a full-time chair, with reserve powers in the event of emergencies. The remaining two commissioners should be appointed on a part-time basis. The commissioners should each have equal voting rights, with decisions being made by consensus, or by a simple majority if a consensus cannot be achieved. Commissioners should be appointed for five year terms, with the ability for these terms to be renewed once only.

Draft Recommendation 2

The Chair of the Energy Safe Victoria Commission should also serve as Chief Executive of ESV and should have responsibility for the corporate leadership of ESV, advised by an Executive Management Board comprising the commission members and no more than five executive managers.

Draft Recommendation 3

Building on its existing *Conflict of Interest Policy*, ESV should develop documented protocols and additional guidance to ensure that perceived and potential conflicts of interest are addressed in its regulatory decision making, particularly in cases where regulatory staff have previously been employed by network businesses or undertaken previous consulting engagements with network businesses.

Draft Recommendation 4

The Executive Management Board of ESV should develop an overarching organisational reform roadmap that details key actions that have already been taken to strengthen ESV's corporate governance and management structures and processes, and the actions that have yet to be completed.

This roadmap should take account of actions in response to the recommendations of this Review of Victoria's Electricity and Gas Network Safety Framework and in response to the findings of previous reviews commissioned by the Director of Energy Safety. The roadmap should be reported publicly on ESV's website and updated quarterly until all key actions have been completed.

Draft Recommendation 5

ESV should develop and implement a formal workforce strategy to support the attraction and retention of high performing staff. This strategy should include a specific focus on broadening the diversity of ESV's workforce over time, including gender diversity.

Regulatory Approach and Capabilities

Draft Recommendation 6

ESV should substantially increase its audit and inspection resources and activity compared to recent years, in accordance with the directions set out in its *Corporate Plan 2017-2020*. Performance against this plan should be reported publicly, including summary information that clearly explains, at a “plain English” level, what ESV has achieved and what more remains to be done to fully deliver its more intensive audit program. This should be supported by detailed information on the audits conducted each year, including: the number of audits, the sites and distribution businesses covered, the focus of the audits and the results of those audits. This should build on and extend existing safety performance reporting by ESV.

Draft Recommendation 7

ESV should conduct an internal review of its expanded audit and inspections program in 2020 to determine whether a further change in the resourcing of these functions is required.

Draft Recommendation 8

ESV should develop an integrated plan of action to strengthen its analytical capabilities and processes to support effective risk-based regulation. This action plan should build on the initiatives outlined in ESV’s *Corporate Plan 2017-2020*. To promote accountability, it should include clear actionable milestones. Progress against the action plan should be reported annually until all planned milestones have been completed.

Draft Recommendation 9

ESV should implement the more robust approach to regulatory compliance and enforcement outlined in its *Corporate Plan 2017-2020*, and prepare an updated *Charter of Consultation and Regulatory Practice* and an updated *Compliance and Enforcement Policy*, to reflect this amended approach.

Draft Recommendation 10

ESV should maintain a sufficient capability to initiate strong enforcement actions, including legal prosecution, when justified on public interest grounds. This should include standing arrangements to ensure it can effectively draw on specialist external resources if and when required. ESV’s capabilities to support strong enforcement actions should be reviewed by ESV’s Executive Management Board annually.

Draft Recommendation 11

ESV should continue to strengthen its internal systems and processes to facilitate robust and consistent compliance and enforcement decision making. This should include the continued operation of the recently re-established Compliance and Enforcement Panel, and any necessary improvements in the internal guidance to ESV officers in compliance and enforcement related roles to ensure timely and consistent decision making.

Draft Recommendation 12

The range of compliance and enforcement tools provided in legislation should be expanded, including provision for injunctions and adverse publicity orders, and giving ESV the capacity to enter into enforceable undertakings. In addition, existing regulatory tools available to ESV should be reviewed to:

- remove unnecessary limitations on what the tools can be used for, including expanding the scope for infringement and improvement notices to be used;
- better align them between electricity and gas sectors; and
- identify any further improvements that may be required.

Draft Recommendation 13

The penalty levels for offences related to electricity and gas networks should be reviewed with a view to increasing them to levels that apply in other leading safety regimes in Australia. As part of this process, the penalties for similar offences applying to pipelines, gas and electricity networks should be aligned.

Draft Recommendation 14

The development of a mature data analytics capability, including the data collection and management systems to support robust statistical analysis, should form a central component of ESV's integrated action plan to strengthen its analytical capabilities. Clear milestones should be developed to promote accountability.

Draft Recommendation 15

ESV should consider and respond to all recommendations of the report *Assessment and Analysis of Incident Data Held by Energy Safe Victoria* as part of strengthening and expanding its Data Management Analytical Strategy.

Engagement Across Regulatory and Interagency Boundaries

Draft Recommendation 16

ESV should review each existing MOU with other regulators and government departments and agencies annually to ensure they remain current and fit-for-purpose.

Draft Recommendation 17

ESV and DELWP should jointly develop an MOU to help manage their respective responsibilities. This should replace the MOU with the former Department of Primary Industries and update the arrangements to reflect the current allocation of responsibilities between ESV and the department. The MOU should recognise and facilitate ESV's independence in regulatory decision making, and the department's role as the principal source of policy advice to the Minister for Energy, Environment and Climate Change.

Draft Recommendation 18

The ESC should complete its review of the voltage variation standards under Clause 4.2.2 of the *Electricity Distribution Code* as soon as practicable. The planned broader reviews by the ESC of the *Electricity Distribution Code* and the *Gas Distribution Code* should ensure technical standards are clearly defined and consider the role of ESV in promoting and enforcing compliance with these standards.

Draft Recommendation 19

ESV should review, and update where necessary, the *Electricity Hazards & Safety Handbook for Emergency Service Personnel* in consultation with DELWP, network businesses and the relevant emergency services agencies. This review should consider any areas in which current operational responsibilities require clarification. In addition, ESV should prepare a Gas Hazards and Safety Handbook in consultation with DELWP, the industry and the relevant emergency services agencies.

Integrating Safety Regulation with Economic Regulation

Draft Recommendation 20

In consultation with the AER, ESV should annually evaluate the operation of its Memorandum of Understanding with the AER. A summary of each evaluation should be published in ESV's Annual Report.

Draft Recommendation 21

In consultation with the AER, ESV should prepare public guidance that sets out clear protocols to facilitate effective engagement between ESV and regulated network businesses as an input into price review processes conducted by the AER.

Draft Recommendation 22

ESV should, in consultation with regulated network operators and the AER, evaluate its requirements for safety cases to ensure that all safety-related elements that have been factored into AER determinations, are identified and supported by clear implementation plans.

ESV should report on the progress made by regulated network operators in its annual network safety performance reports. The reporting should be sufficient to ensure that there is a high degree of transparency to the Victorian community about the progress in the implementation of safety programs.

Draft Recommendation 23

The Victorian Government should request the Australian Energy Market Commission, in close consultation with stakeholders, to develop a clear reliability standard for gas supply to support consideration of a robust, economically justified level of investment for reliable and secure gas supply.

Draft Recommendation 24

The Victorian Government should request the Australian Energy Market Commission, in close consultation with stakeholders, to develop a coordinated planning process to enable overall system planning and to improve the assurance of reliable supply of gas to all declared transmission system and distribution network gas customers in an economically efficient manner.

Promoting Workforce Engagement

Draft Recommendation 25

ESV should establish a consultative committee under Section 8 of the *Energy Safe Victoria Act 2005*. This committee should:

- provide advice to ESV to assist in its consideration of workforce engagement issues;
- contribute to the development of broader workforce engagement strategies, including the sharing of best practices; and
- be comprised of representatives from network businesses, major contractors, trade unions, Worksafe Victoria and the workforce.

Programs to Address Bushfire Risk in Victoria

Draft Recommendation 26

DELWP should develop a transition plan that outlines a clear pathway for the closure of its program components of the Powerline Bushfire Safety Program and handover arrangements for residual components to ensure the learning gained through the program is maintained into the future.

Draft Recommendation 27

The deployment of REFCL technology to satisfy the *Electricity Safety (Bushfire Mitigation) Regulations 2013* should be subject to review prior to each further tranche by an independent expert panel appointed by the Minister for Energy, Environment and Climate Change, with the first report to be provided once further experience has been gathered with the deployment of the first tranche. The panel should draw on advice and input from the Powerline Bushfire Safety Committee that has been established by ESV.

Draft Recommendation 28

ESV should continue to work closely with distribution businesses, and with the assistance of the Powerline Bushfire Safety Committee, to provide timely advice to the Minister for Energy, Environment and Climate Change on the need for any exemptions from the performance standards contained in the *Electricity Safety (Bushfire Mitigation) Regulations 2013*.

Draft Recommendation 29

The Victorian Government should provide ongoing funding for further research and development into new technology to manage the bushfire risk from electric lines. Any funding should be contingent on being at least matched by contributions from distribution companies. The ongoing program should be managed jointly with distribution companies and involve input from university researchers. It should be subject to evaluation at least every four years, with the continued provision of public funding to be contingent on satisfactory research performance.

Regulating Underground Energy Assets

Draft Recommendation 30

The Victorian Government should note the Review's support for the Major Hazard Facilities Advisory Committee's recommendations to formalise the membership and operation of the *Land Development Around Pipelines Working Group* and to task the working group with providing advice to government to improve planning around high pressure gas pipelines.

Draft Recommendation 31

Subject to the completion of a positive regulation impact assessment, *Dial Before You Dig* should be made mandatory in Victoria following the approach that has been adopted in New South Wales.

Regulating the Networks of the Future

Draft Recommendation 32

ESV should establish an expert advisory committee under Section 8 of the *Energy Safe Victoria Act 2005* to advise on emerging trends in electricity and gas networks and possible changes to regulatory settings that might be considered necessary to manage new sources of safety risk.

Draft Recommendation 33

ESV should develop a roadmap of emerging issues and proposed actions to ensure the safety risks arising from new technologies and network structures are identified early and managed effectively. Progress against the roadmap should be reported annually in ESV's Annual Report and network safety performance reports.

Strengthening the Foundations for Future Network Safety Regulation

Draft Recommendation 34

All energy safety legislation should be consolidated in a single new energy safety Act, replacing the *Gas Safety Act 1997*, *Electricity Safety Act 1998*, those elements of the *Pipelines Act 2005* that relate to safety, and the *Energy Safe Victoria Act 2005*.

Draft Recommendation 35

The general safety duties within the new consolidated energy safety legislation should be based around a consistent application of the principle that risks should be reduced as far as “reasonably practicable” aligning with the definition adopted in the *Occupational Health and Safety Act 2004*.

Draft Recommendation 36

The general safety duties within the new consolidated energy safety legislation should be presented clearly, with the aim that they:

- are aligned, but retain necessary sector-specific differences;
- cover a range of circumstances in energy network safety;
- do not easily become outdated and can cover emerging risks and industry changes;
- are clearly expressed as to the obligations imposed and classes of duty holders;
- are enforceable in practice;
- function effectively with safety case provisions under the Act, including enabling the regulator to take compliance and enforcement action in response to unacceptable risk; and
- remain outcomes-based allowing flexibility in compliance arrangements.

Draft Recommendation 37

The consolidated energy safety legislation should provide consistent foundations for the safety case regime in the regulation of electricity and gas network safety. The legislation should make it clear that safety case based regulation must be supported by detailed systems and prescribed standards applied within network businesses. It should also be clear from ESV’s objectives, functions, and business’ safety duties that long-term asset integrity and sustainability are encompassed within the safety case regime and ESV’s regulatory remit.

Draft Recommendation 38

In developing new consolidated energy safety legislation, consideration should be given to improving the structure and operation of regulations under the Act, including, for example, integrating the Code of Practice for Electric Line Clearance into the *Electricity Safety (Electric Line Clearance) Regulations 2015* and setting the expiry period to ten years rather than five.

Draft Recommendation 39

The full responsibility for administering the civil penalty provisions applying to electricity network businesses should be assigned to ESV when it is established as a commission under the new consolidated safety legislation. Any decision to exempt a business from the application of the requirements subject to civil penalties should remain with the responsible Minister.

Draft Recommendation 40

The safety case provisions in the consolidated energy safety legislation should facilitate effective regulation by ESV including:

- providing broad discretion for ESV to request changes;
- providing the capacity for ESV to accept changes or request revisions without it requiring a full revision resetting the five-year revision period;

- providing the capacity for ESV to require a full revision of a safety case resetting the five-year revision period, under circumstances where there has been a material change warranting a full revision; and
- incorporating effective provisions to ensure network businesses have adequate safety cases in place.

Draft Recommendation 41

As part of the consolidated safety legislation, ESV should be given sufficiently wide powers across sectors for requesting information to assist ESV in performing its functions. This should be informed by the powers available to the AER under the *National Electricity Law*.

Draft Recommendation 42

ESV should, in consultation with network businesses, further develop internal and external guidance on its expectations for safety cases, and its approach to evaluating safety cases for acceptance. This should include its approach and expectations for:

- safety case components being clear, measurable and targeted to safety obligations;
- how a precaution-based approach is applied to managing safety risk; and
- safety case submission and revision processes.

Draft Recommendation 43

The consolidated safety legislation should provide for the review of ESV by an independent expert panel appointed by the responsible Minister every five years.

