PROPOSED ELECTRICITY SAFETY (CATHODIC PROTECTION) REGULATIONS

Regulatory Impact Statement

This Regulatory Impact Statement (RIS) has been prepared in accordance with the **Subordinate Legislation Act 1994** to facilitate public consultation on the proposed *Electricity Safety (Cathodic Protection) Regulation.* A copy of the proposed regulations is provided as an attachment to this RIS.

Public comments and submissions are invited on the proposed regulations. All submissions will be treated as public documents. Written comments and submissions should be forwarded by no later than **2 October 2009** to:

Mr. Anthony Bottegal
Legal Officer
Energy Safe Victoria
PO Box 262
Collins Street West VIC 8007

Frontispiece

This regulatory impact statement was prepared for Energy Safe Victoria by Tim Harding & Associates in association with Rivers Economic Consulting.

Foreword

The Electricity Safety (Stray Current Corrosion) Regulations 2009 were made on 31 March 2009 and revoked the Electricity Safety (Stray Current Corrosion) Regulations 1999. A Regulatory Impact Statement ('RIS') for those regulations was released for public consultation on 2 January 2009. While it is considered that the Electricity Safety (Stray Current Corrosion) Regulations 2009 were validly made, due to an administrative error, it is proposed that the Electricity Safety (Stray Current Corrosion) Regulations 2009 be revoked and remade by the proposed Electricity Safety (Cathodic Protection) Regulations 2009 ('the proposed Regulations').

No changes to the substantive content of the Electricity Safety (Stray Current Corrosion) Regulations 2009 are to be made by the proposed Regulations.

Since the release of the above mentioned RIS, there have been no changes in Victoria affecting the cost environment in relation to cathodic protection systems and no further data has been collected by Energy Safe Victoria that is relevant to the analysis in that RIS. Furthermore, there have been no changes in the regulation of cathodic protection systems in other jurisdictions.

Accordingly, the Regulatory Impact Statement ('RIS') that was prepared for the Electricity Safety (Stray Current Corrosion) Regulations 2009 and released for public consultation on 2 January 2009 has been revised and re-released with this foreword for the purposes of fulfilling the requirements under the **Subordinate Legislation Act 1994** in relation to the preparation of the proposed Regulations.

As the proposed Regulations make no changes to the substantive content of the Electricity Safety (Stray Current Corrosion) Regulations 2009, the RIS prepared for the Electricity Safety (Stray Current Corrosion) Regulations 2009 has been updated with minor and consequential updates to reflect the title of the proposed Regulations.

In this RIS, all references to the 'existing Regulations' are to be taken to be a reference to the Electricity Safety (Stray Current Corrosion) Regulations 1999. Those Regulations are referred to in this document as it continues to serve as a useful point of reference.

Summary

Introduction

Stray electrical currents travel along paths (in the earth) other than their intended path. They are attracted to metallic structures, such as gas, oil and water pipelines, and electricity and telecommunications cables; and cause electrical interference and corrosion damage to those structures. To remedy this, the current can be returned to its intended path by a drainage bond (mitigation) or, if generated by a cathodic protection system, by modifying the operation of the system that is causing the currents.

Cathodic protection is a technique used by industry and public authorities to protect metallic structures in contact with the ground from corrosion. It deliberately introduces electrical currents flowing between the metallic structures and anodes (see glossary), which are placed underground.

The owners of the metallic structures install the cathodic protection systems to protect their own assets**.** However, problems can arise when electrical currents, created by these cathodic protection systems, cause the corrosion of other nearby metallic structures in the ground that are not connected to the system and which belong to other owners. Additional risks can be created if the cathodic protection system is not installed or operated correctly and/or the owner of the nearby metallic structure is unaware of the installation of the cathodic protection systems.

In Victoria, cathodic protection systems and mitigation systems are regulated under the **Electricity Safety Act 1998** ('the Act'). The purpose of the Act is to make further provision relating to the safety of electricity supply and use, and the efficiency of electrical equipment.

Energy Safe Victoria (ESV) is Victoria's statutory independent electricity, gas and pipeline safety and technical regulator. ESV was created by the **Energy Safe Victoria Act 2005** through amalgamating the former Office of the Chief Electrical Inspector (OCEI) and the former Office of Gas Safety (OGS).

Amongst other things, the Act assigns ESV the objective of protecting underground and underwater structures from corrosion caused by stray electrical currents. The Act provides that the owner must not operate or allow another person to operate a cathodic protection system unless the system is registered by ESV in accordance with the regulations. Cathodic protection systems must be operated in accordance with the regulations; and any conditions to which the registration is subject.

Section 155 of the Act authorises the Governor in Council to make regulations with respect to various matters dealing with cathodic protection systems and systems for the mitigation of stray current corrosion. These matters include registration, standards, and the installation, use, maintenance, testing and modification of such systems. Section 157 of the Act authorises the Governor in Council to make regulations fixing fees and charges, including maximum or minimum fees and charges, for or with respect to any function or service carried out by ESV.

The broad aim of the regulatory proposal may be summarised as the protection of metallic structures from damage associated with stray current corrosion. This

includes interference from cathodic protection associated with other metallic structures in the vicinity.

The proposed regulations generally deal with a similar range of matters to the existing regulations but with additions and improvements to implement changes in legislation, policy and strategy that have occurred in recent years. These additions and improvements also draw on the operational experience of the existing regulations over the last decade, and take into account input from various stakeholders.

Nature and extent of the problems

The nature and extent of the problems are best identified by considering the likely consequences if there were no relevant regulations or effective alternatives in place by time the existing regulations expire on 28 April 2009. Several significant problems would be likely to arise, including:

- risks to public safety, the environment and property of third parties; and
- inadequate cost recovery, necessitating cross-subsidisation of owners of cathodic protection systems by taxpayers or others.

Policy objective

In relation to the proposed regulations and possible alternatives, the following overarching policy objective is identified:

> *To efficiently minimise risks to public safety, the environment and third party property from stray currents; and where appropriate, to equitably recover the costs of efficiently providing services under the Act.*

The main test for assessing the proposed regulations against the practicable alternatives is their relative net benefit in achieving this policy objective.

The options

The proposed regulations and practicable alternatives (collectively termed 'options') considered in the cost benefit assessment are:

Options relating to public safety, the environment and third party property damage

- Option A: encouragement of voluntary compliance with the relevant Australian standards (non-regulatory option); or
- Option B: the proposed regulations.

Options relating to fees

- Option A1: prescribed actual fees based upon full cost recovery, including law enforcement costs;
- Option B1: prescribed actual fees based upon full cost recovery excluding recovery of law enforcement costs; or
- Option C1: prescribed maximum fees, with ESV to set actual fees based on full cost recovery excluding recovery of law enforcement costs.

The preferred package of options will consist of one option from each of the above groups, that is, either Option A or Option B, plus either Option A1, B1 or C1.

Cost benefit assessment

For both Options A (voluntary compliance with the Australian standards) and Option B (the proposed regulations), the 10-year incremental cost of non-fee regulations would be equal to approximately $0.369m in 2008/09 present value dollars. However, Option B would lead to a greater reduction of risk to public safety and the environment, as well as reduced risk to third party assets from stray currents and interference (Criteria I) than under Option A.

Under the proposed fee regulations (Option B1) the fee schedule is shown in the table below (in dollars for ease of comprehension – the fees in the regulations have been converted to equivalent fees units). The total cost of these fees to owners of cathodic protection systems would be equal to approximately up to $0.95m over 10 years in 2008/09 present value dollars.

The cost of Option C1 (prescribed maximum rather than actual fees) would result in an amount possibly greater than $0.95m (up to between $0.95m and $1.09m) over 10 years in 2008/09 present value dollars. The exact cost of Option C1 would depend on where ESV sets its fees over the next 10 years, based on recovering its costs, which could possibly be higher than the CPI increments set by fee units.

Under Option A1 (full cost recovery including law enforcement costs), the cost of fees to owners of cathodic protection systems would be approximately up to $1.01m over 10 years in 2008/09 present value dollars. However Option A1 would result in less equity as compared to B1 or C1 in that, firstly, law enforcement costs represent a general government obligation to be met by society as a whole rather than from cathodic protection registration fees. Secondly, less equity would result from having law abiding registrants cross subsidising non-law abiding ones. For these reasons, ESV considers that law enforcement costs should not be recovered from the proposed fees for registration of cathodic protection systems.

Using a weighted decision criteria analysis, Options B and B1 (the proposed regulations) provide the highest weighted scores, with Options A, A1 and C1 having the lowest weighted scores. The proposed regulations have the greatest net benefits, and are therefore the preferred option.

Nature and effects of preferred option

A summary comparison of the substantive differences between the existing regulations and the proposed new regulations is given in Appendix 2 to this RIS. The more significant changes are in three main areas:

1. a transfer of obligations from operators to owners of cathodic protection systems, as a result of recent amendments to the Act;
2. the recalculation of fees in accordance with Government cost recovery guidelines, and
3. the omission of regulations requiring the registration of mitigation systems.

A comparison of the proposed fees with the existing fees is given in the following table:

Fee Category	Sunsetting fees	Proposed fees (Option B1)	% change (+/-)
Up to and including 250mA	$125	$99.51	-20.39%
> 250mA and up to 2Amps	$250	$249.06	-0.38%
> 2Amps	$500	$562.52	+12.50%

Note: While presented here in dollar terms for ease of comprehension and comparison, the proposed fees are prescribed in terms of fee units in the proposed regulations.

The proposed changes in the regulations would impose minimal administrative burdens on business and not for profit organisations, which would be less than the $250,000 per annum threshold required by Government guidelines for the measurement of change in administrative burden.

The overall burden of the proposed regulations is likely to be similar to equivalent regulations in Queensland, less onerous than in NSW, but more onerous than in other states and territories. The main reason for this difference is that Victoria has the most complex and concentrated urban train and tram systems, and the mitigation of stray currents from these systems could be frustrated by interference from cathodic protection systems.

National Competition Policy assessment

The costs imposed by the proposed regulations would constitute only a very small fraction of the annual turnover of each business. Therefore, they would not restrict competition by creating a barrier to the entry of new businesses and are unlikely to restrict competition.

Consultation

Preliminary consultation on the proposed regulations has been conducted using three processes:

- consultation with the Victorian Electrolysis Committee (VEC);
- consultation with the Technical Sub-committee of the VEC; and
- letters from ESV to key stakeholder organisations, advising them of the review of the existing regulations and inviting written comments.

Several suggestions were made for improvements to the existing regulations. All relevant comments were taken into account in drafting the proposed regulations.

At this stage, there are no known significant objections to the proposed regulations, although there has been no external consultation as yet on the specific levels of the proposed fee structure.

Comments from interested stakeholders are now invited on the proposed regulations, particularly with respect to the proposed fee structure and the changes from the existing regulations (refer to Part 5.2 of the RIS).

In summary, the RIS concludes that that the proposed regulations:

- **are expected to impose costs on owners of cathodic protection systems;**
- **are expected to confer benefits in terms of minimising risks to public safety and the environment;**
- **are expected to confer net benefits compared to the base case;**
- **are not inequitable in terms of the distribution of costs and benefits; and**
- **do not restrict competition.**

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Preliminary

This Regulatory Impact Statement (RIS) has been prepared to fulfil the requirements of the **Subordinate Legislation Act 1994** and to facilitate public comment on the proposed *Electricity Safety (Cathodic Protection) Regulations* ('the proposed regulations'). The RIS contains information on:

- the nature and extent of the problem to be addressed by the proposed regulations, including relevant research and investigations;
- the policy objectives of proposed solutions to the problem;
- public consultation to date;
- the case for Government intervention;
- the authorising legislation, objectives, nature and effects of the proposed regulations;
- alternatives to the proposed regulations;
- a cost-benefit analysis of the proposed regulations and alternative policy options;
- National Competition Policy tests; and
- an evaluation strategy.

Public comments and submissions are invited on the proposed regulations, in response to information provided in this RIS. All submissions will be treated as public documents. Written comments and submissions should be forwarded by no later than 5 pm on **2 October 2009** to:

Mr. Anthony Bottegal
Legal Officer
Energy Safe Victoria
PO Box 262
Collins Street West VIC 8007

1.0 Background

1.1. Introduction

Stray currents travel along paths (in the earth) other than their intended path. They are attracted to metallic structures, such as gas, oil and water pipelines, and electricity and telecommunications cables; and cause electrical interference and corrosion damage to those structures. To remedy this, the current can be returned to its intended path by a drainage bond (mitigation) or, if generated by a cathodic protection system, by modifying the operation of the system that is causing the currents.

Cathodic protection is a technique used by industry and public authorities to protect metallic structures in contact with the ground from corrosion. It deliberately introduces electrical currents flowing between the metallic structures and anodes (see glossary), which are placed underground.

The owners of the metallic structures install the cathodic protection systems to protect their own assets**.** However, problems can arise when electrical currents, created by these cathodic protection systems, cause the corrosion of other nearby metallic structures in the ground that are not connected to the system and which belong to other owners. This additional risk can be created if the cathodic protection system is not installed or operated correctly and the owner of the nearby metallic structure is unaware of the installation of the cathodic protection systems.

The *Electricity Safety (Stray Current Corrosion) Regulations 1999* ('the existing regulations'), manage the risks of stray current by requiring the registration and testing of CPSs together with prescribing operating standards, to ensure that CPSs are operated effectively and safely.

The existing regulations were made on 28 April 1999 by the Governor in Council under section 155 and 157 of the **Electricity Safety Act 1998**, and came into operation on 3 May 1999. The existing regulations were due to sunset 10 years after the day of making on 28 April 2009.[1] The existing regulations were replaced by the Electricity Safety (Stray Current Corrosion) Regulations 2009 which were made on 31 March 2009. Due to an administrative error, those regulations are proposed to be replaced with new regulations as soon as practicable.

The aim of the proposed regulations (see Appendix 5) may be summarised as the protection of metallic structures from damage associated with stray current corrosion and interference from cathodic protection associated with other metallic structures in the vicinity. This aim is intended to be achieved in the proposed regulations by—

- defining cathodic protection systems and mitigation systems for the purposes of the Act;
- prescribing standards for the operation of cathodic protection systems;
- providing procedures for the registration of cathodic protection systems; and
- prescribing application fees for the registration of cathodic protection systems.

The proposed regulations generally deal with a similar range of matters to the existing regulations but with additions and improvements to implement changes in legislation,

[1] Refer to section 5 of the **Subordinate Legislation Act 1994**.

policy and strategy that have occurred in recent years. These additions and improvements also draw on the operational experience of the existing regulations over the last decade, and take into account input from various stakeholders (refer to Part 1.3 of this RIS).

Under section 9(1)(a) of the **Subordinate Legislation Act 1994**, a regulatory impact statement (RIS) is required to be prepared for all proposed regulations (collectively known as 'statutory rules') unless 'the proposed statutory rule would not impose an appreciable economic or social burden on a sector of the public'.

This regulatory impact statement (RIS) has been prepared to fulfil this requirement. The cost-benefit assessment in Part 4.0 of the RIS identifies the appreciable economic or social burdens to be imposed by the proposed regulations.

To set the scene for this RIS, and to assist in identifying and describing the problem to be addressed by the proposed regulations, this Part provides some general background information about relevant legislation and policies regarding electricity safety in general, and the proposed regulations in particular. This information is provided solely to assist interested parties in better understanding the nature and effects of the proposed regulations within their legislative, economic and environmental context. It is important to emphasise, however, that the RIS is concerned only with the proposed regulations, and not with the Act or with other instruments made under the Act.

1.2 Relevant legislation, policies and guidelines

1.2.1 What is stray current corrosion?

Stray current corrosion has been associated with electrified rail traction systems, buried structures influenced by different cathodic protection systems, mining, manufacturing operations, shipping/boating, microelectronics and other systems.

An electric current consists of a flow of electrons (negatively charged sub-atomic particles) from one part of a metal to another. An *anode* is where a metal has a net loss of electrons, thus acquiring a positive charge. A *cathode* is where a metal has a net gain of electrons, thus becoming negatively charged.

The term *stray current* refers to current flowing through paths other than the intended circuit(s). *Stray current corrosion* refers to corrosion damage resulting from current flow other than in the intended circuit(s). For larger structures this term usually alludes to corrosion damage caused by extraneous current(s) flowing through soil and/or water.

Trams and railways are one of the most significant sources of stray currents. Trains positioned on a rail are fed by a power station through an overhead wire and return their current back to the power station via the rails. When these rails are poorly insulated from earth, considerable amounts of direct current (DC) currents leak into the soil and can be picked up by metal structures such as protected pipelines. This type of interference is referred to as DC traction interference.[2] It is controlled by the use of electrolysis drainage bonds and other *mitigation systems*.

When mild steel is exposed to oxygen and water (as exists underwater and underground in most soils), it rusts rapidly – much faster than in dry air. This rusting

[2] <http://corrosion-doctors.org/Journal-2000/No5/No5-page4e.htm>

is an electrochemical reaction known as *wet corrosion*[3], or *electrochemical corrosion.* Wet corrosion is a combination of chemical reactions with an associated flow of electrical energy or corrosion current. Such corrosion results in progressive damage to the metal, which if left unchecked can cause the eventual failure of metal structures, with potentially dangerous and costly consequences. For example, a current of one amp over a 12 month period can remove 9kg of steel from a structure.[4]

Consider, for example, steel pipelines of which there are approximately 4,700km of onshore length in Victoria. These pipelines often carry energy products at high pressure, including hazardous and highly combustible gaseous and liquid products.[5] Because of the huge capital cost of these pipelines, their inaccessibility if buried, the disruption to energy supplies caused by renewal, and the potentially catastrophic consequences of undetected corrosion failure, it is obviously very important to ensure that these pipelines do not corrode. How is this done?[6]

1.2.1 What are cathodic protection systems?

One obvious way of protecting the pipeline is by covering it with some inert material to exclude the water and oxygen. However, such coverings rarely provide complete protection – even minor damage to the covering can expose the pipeline to corrosion.[7]

Buried pipelines are usually protected against corrosion damage by the combination of a protective coating system and cathodic protection. The coating is usually considered to represent the primary form of protection, while the cathodic protection system is designed to provide protection at coating discontinuities (defects) that are invariably present. As such, the cathodic protection system can be viewed as 'additional insurance' against the corrosion risk factor.[8]

In many practical situations where it is impossible to change the nature of the environment, corrosion may be prevented by employing cathodic protection on a buried or submerged structure. This is achieved by applying an appropriate direct current flowing in opposition to the original corrosion current, thus preventing the natural tendency of the metal to react with its environment.

To employ cathodic protection, a circuit is established by connecting a suitable source of direct current to the structure to be protected. Two types of cathodic protection systems are available, as follows:

(a) *Galvanic anode systems*, which employ metallic anodes that are consumed to provide the source of direct current for protection of the structure. The driving voltage for the protective current comes from the natural potential difference that exists between the structure and a second metal (the galvanic anode).

(b) *Impressed current systems*, in which the driving voltage for the protective current between the structure and the anode is supplied by an external direct current power source.[9]

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[3] Ashby and Jones, 1981.
[4] Victorian Electrolysis Committee, 2002.
[5] Tim Harding & Associates, 2006.
[6] Ashby and Jones, 1981.
[7] *Ibid.*
[8] <http://www.corrosion-club.com/sttheory.htm>
[9] Australian Standard AS 2832.

Figure A1 is a schematic diagram illustrating cathodic protection of a buried structure using a sacrificial galvanic anode system. Figure A2 is a schematic diagram illustrating cathodic protection of a buried structure using an impressed current system.

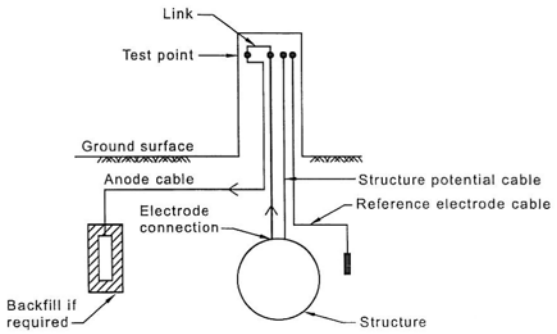

FIGURE A1 CATHODIC PROTECTION OF A BURIED STRUCTURE USING A SACRIFICIAL GALVANIC ANODE SYSTEM

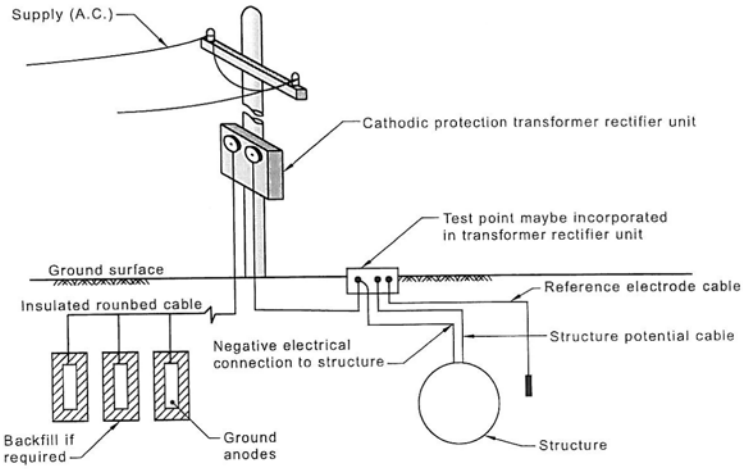

FIGURE A2 CATHODIC PROTECTION OF A BURIED STRUCTURE USING AN IMPRESSED CURRENT SYSTEM

The number of cathodic protection systems in Victoria is approximately 13,756. Table 1 sets out the current proportions of each type of cathodic protection system at different current levels.

Table 1 - Proportions of each type of cathodic protection system in Victoria

Current class	Type of cathodic protection system	
	% using galvanic anodes	% using impressed current
Under 250mA	81.3%	0.05%
Between 250mA & 2Amps	11.6%	1.46%
Over 2 Amps	0.34%	5.25%

Source: ESV

The total number of cathodic protection systems in Victoria has been steadily increasing with the economic growth and capital development of the State. This trend is likely to continue in future.

1.2.2 Relevant legislation

In Victoria, cathodic protection systems and mitigation systems are regulated under the **Electricity Safety Act 1998** ('the Act'). The purpose of the Act is to make further provision relating to the safety of electricity supply and use and the efficiency of electrical equipment.

Energy Safe Victoria (ESV) is Victoria's statutory independent electricity, gas and pipeline safety and technical regulator. ESV was created by the **Energy Safe Victoria Act 2005** through amalgamating the former Office of the Chief Electrical Inspector (OCEI) and the former Office of Gas Safety (OGS).

Amongst other things, the **Electricity Safety Act 1998** ('the Act') assigns ESV the objective of protecting underground and underwater structures from corrosion caused by stray electrical currents.

The Act also establishes the Victorian Electrolysis Committee (VEC) to provide advice to ESV on any matter related to electrolysis and the regulations relating to cathodic protection and the mitigation of stray current corrosion. This includes the establishment and maintenance of standards for systems for cathodic protection and for the mitigation of stray current corrosion. The VEC is composed of nominees from ESV and the traction, electricity, water, gas, telecommunications and oil industries.

Section 93 of the Act provides that the owner must not operate or allow another person to operate a cathodic protection system unless the system is registered by ESV in accordance with the regulations. Cathodic protection systems must be operated in accordance with the regulations; and any conditions to which the registration is subject.

Section 96 of the Act enables ESV to require a person who is the operator of a cathodic protection system or mitigation system to carry out such tests of the system and such modifications to or replacement of the system as ESV directs.

Section 155 of the Act authorises the Governor in Council to make regulations with respect to various matters dealing with cathodic protection systems and systems for the mitigation of stray current corrosion. These matters include registration, standards, and the installation, use, maintenance, testing and modification of such systems.

Section 157 of the Act authorises the Governor in Council to make regulations fixing fees and charges, including maximum or minimum fees and charges, for or with respect to any function or service carried out by ESV.

Sections 155 and 157 together are referred to as the 'authorising provisions' for both the existing and the proposed regulations. As discussed in Part 1.1, the existing regulations manage the risks of stray current by requiring the registration and testing of CPSs together with prescribing operating standards, to ensure that CPSs are operated effectively and safely.

There is no other legislation dealing with the problems identified in this RIS regarding cathodic protection systems or mitigation systems in Victoria.

There have been no significant changes in the relevant legislation or policy in the last 10 years, apart from minor amendments as discussed in Part 5.2 of this RIS.

1.3 Consultation to date

Preliminary consultation on the proposed regulations has been conducted using three processes:

- consultation with the VEC;[10]
- consultation with the Technical Sub-committee of the VEC; and
- letters from ESV to key stakeholder organisations, advising them of the review of the existing regulations and inviting written comments.

The VEC was first consulted in May 2006 and the proposed regulations have been an agenda item since that time (the VEC meets quarterly). The VEC maintains its support for the continued existence of the regulations as a mechanism to protect underground metallic structures from corrosion.

The letters and e-mails were sent to the major stakeholder organisations listed in Appendix 1 enclosing a copy of the existing regulations and inviting comments. Written responses were received from the following stakeholder companies:

- SP AusNet
- Alinta
- APA Group
- SEA Gas

Several suggestions were made for improvements to the existing regulations. All relevant comments were taken into account in drafting the proposed regulations.

The APA Group pointed out that the reference to the relevant Australian Standards in the existing regulations was outdated (of which the ESV was well aware); and that the legal obligation should be on the owner of the cathodic protection system rather than the operator.

SP Ausnet outlined its plan to install galvanic anode cathodic protection systems on each of its 4000 electricity transmission towers over the coming years. In light of the number of systems proposed, SP Ausnet was of the view that the proposed fee structure would impact unfairly on their business. Accordingly, SP Ausnet suggested

[10] Refer to Part 1.2.2 of this RIS.

that systems attached to electricity transmission towers be treated differently to that of other CP systems, recommending that registrations be granted on a 'line' or 'geographical' basis rather than on each individual system. In support of its recommendation, SP Ausnet submitted that the processing of individual applications for a number of towers in similar geographical locations would require the same effort as for a single tower. While it is true that such grouped systems may be simpler for ESV to process, the major costs in relation to the registration of cathodic protection systems are administrative and are incurred with respect to each individual site (tower). Regardless of the number of applications, each tower would still have to be assessed and audited on an individual basis. There is no policy reason to treat transmission towers any differently to an underground pipeline, which also can have a number of systems spaced along a line. This issue has been considered by the VEC in the past (in relation to pipelines) and it was recommended by the Committee that each site along a pipeline should hold a separate registration. Further, it would be inequitable to require the owners of other assets to subsidise a reduced fee for electricity transmission towers. Therefore, ESV has not adopted this suggestion.

At this stage, there are no known significant objections to the proposed regulations.

A further consultation period of 28 days will be held upon the publication of this RIS. During this period stakeholders will be invited to make further submissions on the proposed regulations. The RIS will be advertised in the Government Gazette and in a daily newspaper as required by the *Subordinate Legislation Act 1994*. In addition, it is proposed that the RIS will be advertised on the ESV website and copies will be sent to members of the Victorian Electrolysis Committee and associated committees.

2.0 The problem and the policy objective

2.1 The nature and extent of the problems

In accordance with Government guidelines,[11] a Regulatory Impact Statement (RIS) is required to identify and describe the problems to be addressed by the proposed regulations. *In other words, why are the regulations being proposed?*

The provisions of the Act indicate an intention by the Parliament that certain matters of detail in the overall legislative scheme would be prescribed by regulation rather than by the Act, in accordance with the guidelines issued under the **Subordinate Legislation Act 1994**. These guidelines state that—

> Primary legislation is usually drafted in general rather than specific terms with a view to avoiding the need to make frequent changes. Matters of detail liable to frequent change should, where possible, be dealt with by subordinate legislation rather than primary legislation. However, the rule is that matters of policy, general principle and the like should be reserved to primary legislation.

The guidelines further state that the following matters are more appropriately dealt with by subordinate legislation than by primary legislation-

(a) matters relating to detailed implementation of policy, general principles and standards (rather than the policy, principle or standard itself);

(b) prescribing fees to be paid for various services;

(c) prescribing forms (if it is necessary that they be prescribed) for use in connection with legislation; and

(d) times within which certain steps should be taken.[12]

The nature and extent of the problems are best identified by considering the likely consequences if there were no relevant regulations.

In summary, problems can arise when electrical currents, created by cathodic protection systems, cause the corrosion of other nearby metallic structures in the ground that are not connected to the system and which belong to other owners. Optimal cathodic protection of the assets of one owner could result in damage to underground assets owned by others. The earth is a 'shared resource' and the legislative scheme is aimed managing this shared resource.

Additional risks can be created if the cathodic protection system is not installed or operated correctly and/or the owner of the nearby metallic structure is unaware of the installation of the cathodic protection systems. Undiscovered and unchecked cathodic protection interference can result in the owner of the affected structure having to increase his own cathodic protection level. This in turn would cause further interference and electrical current levels would increase cumulatively in the area. An overuse of electrical current in the ground could lead to more interference and corrosion risk and, apart from risks to safety and the environment, lead to higher level maintenance and depreciation costs.

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[11] Government of Victoria, 2007.

[12] Guidelines under Section 26 **Subordinate Legislation Act 1994** (effective 17 January 2005) Guideline 1.09.

The market failure associated with these problems and possible common law solutions are discussed in Part 2.3 of this RIS.

Without the proposed legislative scheme (which seeks to ascertain the potential of a cathodic protection system for causing damage before it begins operating) a damage-causing system would only be identified after it has caused the damage. In other words, the risks to public safety and damage to third party property would occur before the damaging-causing system is identified and modified. Minor modification can prevent the damage occurring, but this requires the identification and registration of systems, so that their location and ownership is known.

In the absence of regulation or effective alternatives dealing with these problems, there would be significant gaps and inadequacies in the implementation of the Act with respect to cathodic protection and stray current corrosion. Some of these gaps can only be filled by regulation. Specifically, without the proposed regulations, several significant problems would be likely to arise as discussed below.

2.1.1 Risks to public safety, the environment and property of third parties

If there were no regulations, the following consequences to public safety, the environment and property of third parties would arise:

- no cathodic protection systems or mitigation systems would be prescribed for the purposes of the Act;
- no cathodic protection standards would be prescribed;
- there would be no power to require testing, modifications or annual audits, or to withdraw registration of cathodic protection systems;
- there would be no requirement to give notice of impending operation of impressed systems; and
- there would be no requirement for ESV to keep a register of cathodic protection systems.

Each of these consequences will now be discussed in order of likely severity.

2.1.1.1 No prescription of cathodic protection systems or mitigation systems

Under section 3 of the Act, a '*cathodic protection system'* is defined for the purposes of the Act as meaning 'a prescribed system designed to use direct electric current to protect metallic structures from corrosion'. Similarly, a '*mitigation system'* is defined for the purposes of the Act as meaning 'a prescribed system designed to reduce the effects on metallic structures of the leakage of stray electrical currents'.

If no systems were prescribed,[13] then the terms 'cathodic protection system' and 'mitigation system' as used in the Act would have no meaning or practical effect. This would mean that the whole of Part 9 of the Act would be largely inoperative. There would be no requirement to register cathodic protection systems under section 93 of the Act; nor would there be any requirement to operate such systems in accordance with the regulations or with any conditions of registration. ESV would have no power to issue directions in relation to mitigation systems or cathodic

[13] Meaning prescribed by regulations made under the Act.

protection systems under sections 95 or 96 of the Act, nor to recover the costs of actions in relation to a mitigation systems under section 97.

In other words, if neither 'cathodic protection systems' nor 'mitigation systems' were prescribed, then these systems would become largely unregulated and immune from public scrutiny. In particular, the owners of metallic structures would be unaware of the installation of nearby cathodic protection systems that could damage their assets if designed, installed or operated incorrectly.

2.1.1.2 No prescription of standards

There are obvious efficiencies in adopting national standards which set minimum requirements for major metallic structures such as pipelines, given that many pipelines cross borders into other states and territories. Unnecessary costs would be imposed if a pipeline owner were required to design install and operate cathodic protection systems to two or more sets of standards.

The Australian Standard for cathodic protection systems is AS 2832 '*Cathodic protection of metals'*. This Standard applies to the design, installation, testing, operation and maintenance of cathodic protection systems. The parts of the Standard relevant to the proposed regulations are:

- Part 1: Pipes and Cables;
- Part 2: Compact buried structures;
- Part 3: Fixed immersed structures; and
- Part 5: Steel in concrete structures.[14]

The aim of these standards is to provide the required protection with the minimum amount of current. This not only ensures the integrity of the structure coating system but also limits the amount of interference caused to adjacent metallic buried structures.

If no standards were prescribed by regulation, there would be no legal obligation for cathodic protection systems to comply with these standards. ESV advises that it would be rare for an owner to fail to comply with the proposed prescribed standards 1, 2, 3 and 5, as the systems that are installed are designed by professional cathodic protection engineers. According to ESV, design and installation compliance with the relevant Australian Standards is regarded as an indicator of professional competence. This is crucial with regards to the installation of cathodic protection systems in that cathodic protection engineers are represented by small market where reputation is crucial in securing future business. Therefore, incentive compatibility is generated between the need to secure ongoing business and the need to ensure professional competence through compliance with the prescribed standards. A further element which promotes compliance on the part of owners of the cathodic protection systems is the representation of major stakeholders (owners) on the Victorian Electrolysis Committee. In this committee, there is a high level of self- regulation and peer group influence to comply with the standards with respect to ongoing operation and maintenance matters.

[14] Part 4 of AS 2832 deals with systems designed to protect the internal surfaces of structures, which are not covered by the proposed regulations refer to Regulation 5(1)].

However, there is no guarantee that all cathodic protection systems would be operated and maintained in accordance with these standards. When considering the need for government intervention, both the risk of incidence of problems and the likely impacts if such problems do occur are relevant. Even if only a small proportion of systems do not comply with the standards, the impact of such non-compliance could be very high.

For example, about half of the reported incidents of pipeline damage in Victoria between 1985 and 2004 were caused by corrosion as a result of poor operation and maintenance procedures as listed in Table 2, (Stray current is a cause of corrosion, however no data is available that identifies which incidents of corrosion can be attributable to stray currents).

Table 2 – List of pipeline incidents in Victoria caused by corrosion 1985 - 2004

Year	Product in Pipeline	Quantity	Cause
1986	Liquid HC	3,000 litres	Corrosion
1987	Liquid HC	100,000 litres	Corrosion of most of the section of pipeline.
1988	Liquid HC	300 litres	Corrosion
1989	Petrol	10 litres	Corrosion
1989	Diesel	6,000 litres	Corrosion
1989	Diesel	300 litres	Corrosion
1990	Petrol	No leak	Corrosion
1991	Diesel	Minor leak	Corrosion
1991	Petrol	2,000 litres	Corrosion
2004	Liquid HC	No estimate done	Corrosion

Source: Department of Primary Industries (DPI)

In 1987, about 100,000 litres of liquid hydrocarbon leaked from an underground licensed pipeline due to corrosion damage and resulted in soil contamination. Subsequently the entire pipeline was replaced.

In December 2006, Mobil notified the authorities of a pipeline failure, as a result of corrosion damage, at Champion Road, Newport.[15] Thousands of litres of refined liquid hydrocarbon leaked into the soil and water table. The Victorian Environment Protection Authority (EPA) was contacted by the licensee to obtain an approval for the waste disposal. (Whenever soil is contaminated by any liquid spill from a licensed pipeline, the licensee is required by DPI to contact the EPA). This is a major problem and could take up to 10 years to fully clean up. The final cost of this leak cannot be estimated but is expected to be in the millions of dollars.[16] The EPA has expressed considerable concern about the contamination of soils and groundwater with toxic substances from leaking pipelines, which usually occurs as a result of corrosion.

[15] This particular corrosion damage is not linked to stray currents. However, it serves as an example of the impacts that corrosion damage in general can cause.

[16] <http://www.epa.vic.gov.au/land/newport_pipeline/newport_pipeline_leak.asp>

In June 2007, the underground pipe-work at the Mill Park Lakes School was seriously damaged by the stray current from a Melbourne Water impressed current system that had the ground-bed located adjacent to the school. All of the copper underground pipe-work (gas and water) had to be replaced. This damage occurred within approximately two months of the pipe-work being installed. The total cost of the damage was $600,000.

Fortunately, there have as yet been no reported deaths or injuries to members of the public[17] as a result of stray current corrosion incidents in Victoria. However, explosions caused by damaged fuel and gas pipes have caused significant losses of life and property in other parts of the world.[18]

Protection from corrosion damage caused by cathodic protection interference is provided to underground structures, which have a total value of the order of several thousand million dollars, throughout the State of Victoria. Even small percentage reductions in maintenance and depreciation costs would represent substantial savings. Failure of gas, oil and water pipelines and telecommunication and power cables involve interruption to essential services of energy, water, communication and transport and could result in extremely high costs to the community.[19]

2.1.1.3 No power to require testing, modifications or annual audits, or to withdraw registration

AS 2832 specifies that identification and testing of surrounding underground assets needs to be conducted before a cathodic protection system is installed. However, compliance with this standard is voluntary unless prescribed by regulation.

The power to require testing, modifications or annual audits, or to withdraw registration of cathodic protection systems are essential components of ESV enforcement systems. Without these, ESV would be severely inhibited in its ability to ensure compliance with the prescribed standards

2.1.1.4 No requirement to consult third parties regarding applications

Without regulations, there would be no requirement to consult third parties regarding applications for systems >250 milliamps. Owners of nearby metallic structures could be unaware of the proposed installation of the higher current cathodic protection systems, which if not designed, installed or operated correctly could damage their structures.

AS 2832 states that approval of local landowners should be sought and that liaison with other authorities should be undertaken. However, the standard does not detail how this is to be done, or what to do if there is disagreement. The proposed regulations provide these procedures and remove the need for individuals to liaise with public authorities and utility companies. This is done for them during the application process (which involves the relevant authorities and companies).

2.1.1.5 No requirement to give notice of impending operation of impressed systems

If there were no requirement for owners of impressed systems to give notice of impending operation, ESV would be prevented from monitoring and auditing the

[17] The risks of deaths and injuries to workers are minimised by separate occupational health and safety legislation.
[18] Tim Harding & Associates, 2006.
[19] Chief Electrical Inspector, 1998.

operation of the system, inhibiting its ability to ensure compliance with the prescribed standards.

2.1.1.6 No requirement for ESV to keep a register of cathodic protection systems.

If there were no requirement for ESV to keep a register of cathodic protection systems, there would be no public record of such systems. ESV and other agencies such as the EPA would be hindered in their investigations of corrosion or pollution incidents. Owners of nearby metallic structure would be unaware of the installation of the cathodic protection systems, which if not designed, installed or operated correctly could damage their structures.

Undiscovered and unchecked cathodic protection interference could result in the owner of the affected structure having to increase his own cathodic protection level. This in turn would cause further interference and further protection to increase cumulatively throughout the state. The result would be a higher than necessary level of electrical current in the ground with a much increased interference corrosion risk and actual corrosion damaged and a much increased cost of maintenance and corrosion protection to all structure owners.[20]

2.1.2 Inadequate cost recovery

A fee is generally defined as a charge levied in order to recover some or all of the cost of providing a private service. The power to set a fee generally does not authorise the recovery of revenue greater than the cost of the service provided. A tax, by contrast, is an impost levied on some or all members of the community by the Government in order to raise revenue for general expenditure purposes.

The basic justification for the charging of fees by government agencies such as ESV is to recover the costs of providing services to applicants for registration, either in full or in part. There is a user-pays principle involved whereby those who use the services should be obliged to pay the cost of such services, rather than the funding being provided by taxpayers.

When designed and implemented appropriately, the adoption of cost recovery has the potential to advance efficiency and equity objectives. *Allocative efficiency* is achieved when the value consumers place on a good or service equals the cost of resources used up in production. *Horizontal equity* refers to those who benefit from government activities, or those that contribute to the need for government regulation, having to pay the associated costs.[21]

The relevant Department of Treasury and Finance guidelines state that user charges should be set on a full cost recovery basis because it ensure that both efficiency and equity objectives are met. There are nevertheless situations where it may be desirable to recover at less than full cost, or not to recover costs at all. Examples of such situations include circumstances where:

- practical implementation issues make cost recovery infeasible;
- there are public goods or benefits to unrelated third parties (sometimes referred to as ‘positive externalities’) or merit goods concerns;

[20] Chief Electrical Inspector, 1998.
[21] Department of Treasury and Finance, 2007.

- social policy or vertical equity considerations are considered to outweigh the efficiency objectives associated with full cost recovery;
- the government is providing goods and services on a commercial basis in competition with the private sector; [22] or
- full cost-recovery might adversely affect the achievement of other government policy objectives.

If there were no regulations, no fees would be prescribed for services provided by ESV in relation to the registration of cathodic protection systems. This would mean that there would be no cost recovery for these services, resulting in 100% subsidisation of users of these services by non-users. As shown in Table 3[23], this would result in an estimated revenue shortfall of approximately ***$0.95m*** over 10 years in present value 2008/2009 dollars - to be funded from the public purse or other sources.

Table 3 - Cost of cathodic protection system registration activities by ESV 2008-09 to 2017/18 in present value 2008/09 dollars

Activity	10 year cost	10-year discounted[24] fee cost in present value 2008/2009 dollars
Processing applications for cathodic protection systems up to and including 250mA	$336,510.63	$287,240.14
Processing applications for cathodic protection systems > 250mA and up to 2Amps	$133,652.08	$114,083.30
Processing applications for cathodic protection systems > 2Amps	$643,046.14	$548,893.99
Total cost	***$1,113,208.85***	***$950,217.43***

An issue to be addressed in the RIS will be whether the full cost of services provided to applicants for registration should be recovered by means of fees, or whether there are circumstances where it may be desirable to recover at less than full cost, or not to recover costs at all. This issue is discussed in Part 3.0 of the RIS.

2.2 Policy objective

To address the problems identified in Part 2.1 of this RIS, the broad aim of the regulatory proposal may be summarised as the protection of metallic structures from damage associated with stray current corrosion. This includes interference from cathodic protection associated with other metallic structures in the vicinity. A successful outcome for the proposed regulations and possible alternatives would be an absence of corrosion damage in areas where cathodic protection systems are operating.

Having regard to purposes of the Act and the above discussion, the following overarching policy objective is therefore identified:

[22] The principles of competitive neutrality may be relevant here – there may be some net cost advantages arising from public ownership that need to be taken into account.
[23] See section A3.6 of Appendix 3 for source of Table.
[24] A discount factor of 3.5% is used for present value calculations.

To efficiently minimise risks to public safety, the environment and third party property from stray currents; and where appropriate, to equitably recover the costs of efficiently providing services under the Act.

The main test for assessing the proposed regulations against the practicable alternatives is their relative net benefit in achieving this policy objective.

While necessarily narrower in scope, this policy objective is consistent with the objects of ESV as set out in the Act, as discussed in Part 1.2.2 of this RIS.

2.3 Need for intervention

Having identified the nature and extent of the problems and the policy objective, the 'threshold' or preliminary question to be addressed in an RIS is: *Is there a sufficient case for further government intervention to assist in solving the problems?*

2.3.1 Possible common law solutions

Persons (including corporate persons) are subject to a duty of care under common law. The duty requires a person to take reasonable precautions against a risk of harm in cases where that risk of harm is foreseeable (that is, it is a risk that the person knew or ought to have known). A person who fails to take reasonable precautions against such risks is negligent.[25]

In the absence of the proposed regulations, it may be suggested that the duty discussed above would provide an incentive to the owners of cathodic protection systems to take positive steps not to damage underground assets belonging to other people. The rationale for this being that the fear of liability would compel owners of cathodic protection systems to (as a minimum) take the safety precautions that cost less than the accidents they prevent.[26]

The approach referred to above would fail to adequately address the problems that the proposed regulations seek to address. Because the earth is a shared resource, no single asset owner has the ability to manage or guard against the risks created by stray currents in the ground. The only way to adequately manage the risk of stray currents in the ground is through a collaborative and cooperative effort on the part of all underground asset owners. Also, one cannot take reasonable action against risks if those risks are unknown (as the case would be without proposed regulations).

The proposed regulations facilitate this collaborative process by providing a central repository for cathodic protection system records (which can be accessed by stakeholders), consultation and negotiation between affected asset owners including a 'one stop' forum of primary stakeholders (the VEC and its technical sub-committee) This streamlines consultation and ensures that all applications are comprehensively reviewed by affected stakeholders.

The law of negligence would not provide the necessary mechanisms to adequately manage the risks of stray currents. Further, without these regulations, any attempt by an individual asset owner to manage the risks associated with stray currents would be most likely to be difficult to achieve.

[25] Wrongs Act 1958 (Vic), Division 2 of Part 1.
[26] Abel, 1990.

2.3.2 Economic grounds for intervention

There is a clear economic case for government intervention in markets where some form of **market failure** is taking place. Government can justify this by saying that intervention is in the public interest. Basically, market failure occurs when markets fail to deliver an efficient allocation of resources (economic efficiency). The result is a loss of economic and social welfare. The relevant sources of market failure addressed by the proposed regulations are associated with those of **externalities** and **public goods,** including **information failure**. In other words, market forces alone would not be expected to address the problems identified in Part 2.1 of this RIS and intervention in the form of regulations or other effective alternatives is necessary.

Externalities arise where private decision makers do not incur all the costs or receive all the benefits of their decisions. Negative production externalities, arising from the use of cathodic protection, result from stray currents interfering with or damaging third party assets and lead to greater 'social costs'. As discussed in Part 2.1 of this RIS, stray currents can cause corrosion to metallic structures, including those owned by third parties and can interfere with other cathodic protection systems. The consequential interference with other cathodic protection systems and damage or failure of metallic structures, such as pipelines, includes both substantial risks to public safety and the environment, as well as increased maintenance and depreciation costs.

Corporate owners of cathodic protection systems are obliged under corporations law to act in the interests of the company's shareholders. It is acknowledged that shareholder interests have changed over time placing greater emphasis on corporate and social responsibility in order to meet more sophisticated consumer preferences. However such an emphasis remains voluntary and would not be expected to internalise all third party social costs.

Public safety, environment protection and law enforcement[27] are prime examples of **public goods.** Consumption of the benefits of such public goods by one individual does not reduce the amount of benefits available for consumption by others. A market solution will fail to provide/provide sufficient levels of the public good because of free riding. That is to say, there would be no way for the provider to keep those who do not pay for the public good from enjoying the benefits of that good. In this case, public safety and environment protection would be provided by markets to some extent because it is in the interests of owners of metallic structures to protect their capital assets from damage.[28] However, these interests are unlikely to be sufficient to protect public safety and environment as the damage to the public and environment as a result of major incident can often be far more than the damage to the metallic structure itself (refer to Part 2.1 of this RIS).

Information failure is a special kind of market failure. If individual owners of metallic structures act without knowing the levels and effects of other cathodic protection systems (used for other assets), they are likely to make decisions which are sub-optimal from the community's viewpoint. Having an awareness of the potential for interference to other cathodic protection systems and associated costs is not necessarily the same as acting in recognition of such costs. The market would fail to generate adequate investment in information and the quality of such information due

[27] Abelson, 2008 p.61.
[28] Tim Harding & Associates in association with Rivers Economic Consulting (2006)

to free riding. Therefore less than fully informed decisions would continue to be made with regard to cathodic protection activities.

Undiscovered and unchecked cathodic protection interference can result in the owner of the affected structure having to increase his own cathodic protection level. This in turn would cause further interference and further protection to increase cumulatively throughout the state, as discussed in Part 2.1 in this RIS. An overuse of electrical current in the ground, could lead to more interference and corrosion risk and, apart from risks to safety and the environment, lead to higher level maintenance and depreciation costs. Therefore regulations prescribing, requiring registration and placing conditions on the operation of cathodic protection systems may be necessary.

Whether market failure arises from externalities, public goods, or information failure the role of government intervention is to strike the socially optimal balance between economic activity resulting from the use of cathodic protection systems on the one hand, and risks to third party assets, on the other.

Because of the specific provisions of the Act, fees can only be set by regulation. For these reasons, intervention through some form of regulation is necessary in relation to fees.

2.4 Feasibility of intervention: compliance issues

The next preliminary question to be addressed is whether Government intervention is feasible, that is, *are regulations likely to be effective?*

A measure of the effectiveness of the proposed regulations is the likely level of compliance with them.

Where offences against the Act or the Regulations are detected, authorised officers are empowered to issue warnings or infringement notices, or to issue proceedings by summons, depending upon the circumstances and evidence in each case.

Energy Safe Victoria (ESV) aims to encourage compliance with the Act and regulations through education and co-operation. However, in some instances, it is necessary for ESV to take action to enforce compliance and ensure public safety.

In enforcing the requirements of the Acts and the associated regulations, ESV will be guided by the following principles:

- Enforcement will be undertaken in a fair, predictable and consistent manner;
- Enforcement will be applied consistently to individuals and companies (as far as practicable);
- Enforcement will be undertaken using lawful procedures ;
- The emphasis in administration and enforcement will be on ensuring public safety, equipment efficiency and compliance with the Act and Regulations.
- Within the limitations of available resources, ESV will use reasonable endeavours to investigate all suspected offences; and
- The primary purpose of enforcement measures is to stop activities that risk electrical or gas safety by making offenders accountable as a deterrent to those

involved and to others who may not be complying with the Acts and the regulations.[29]

In all cases, regardless of the offence(s), discretion to prosecute or take other enforcement action exists. Discretion is the free exercise of judgment to choose between possible causes of action or non-action, in situations not clearly requiring mandatory action by law, policy or directive. Appropriate considerations in exercising discretion include:

- the seriousness of the offence;
- the extent of injury to persons or damage to property;
- risk to public safety; and
- the past record of the offender.

Enforcement options considered by ESV may include the following:

- No action;
- Warnings;
- Directions - instructions to take certain action or provide information or materials;
- Infringement Notices - fines for selected offences;
- Prosecution - via the Court system; and/or
- Imposing of conditions [30]

Regulations for cathodic protection systems are enforced by random audit. ESV may, by notice, require the owner to test performance of the system to determine the extent of interference to other structures and report back on the results of the test. ESV may require design alterations, the installation of measures necessary to limit interference to acceptable agreed values or relocation, or cancellation of registration, if necessary to eliminate probable unacceptable interference to other structures. An owner must cease operation as soon as possible if the registration is withdrawn and there are penalties for failure to comply with the regulations.[31]

The existing regulations also require the operator of cathodic protection systems with an output of 250 milliamperes or more (that is, 1,716 systems) to audit the operating current annually, and to keep records of the results. (The proposed regulations have similar requirement except that the audit obligation is place on the owner rather than the operator).

Other instruments[32] require people to notify ESV of incidents. ESV also identifies problems through the targeted Area Testing Program. In addition, members of the VEC bring their concerns to the table during meetings. ESV investigates such incidents and problems where appropriate. However, without regulations, ESV would not have sufficient powers to conduct such investigations or to rectify problems, especially those that require the testing of systems.

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[29] ESV web site <http://www.esv.vic.gov.au/AboutESV/TheroleofESV/tabid/138/Default.aspx>
[30] ESV web site <http://www.esv.vic.gov.au/AboutESV/TheroleofESV/tabid/138/Default.aspx>
[31] Chief Electrical Inspector, 1998.
[32] For example, the *Gas Safety (Safety Case) Regulations 1999* and the *Pipelines Regulations 2007*

ESV advises that it would be rare for an owner to fail to comply with the proposed prescribed standards 1, 2, 3 and 5, as the systems that are installed are designed by professional cathodic protection engineers. Their aim is to provide the required protection with the minimum amount of current. This not only ensures the integrity of the structure coating system but also limits the amount of interference caused to adjacent metallic buried structures. However, without the proposed regulations, there is no guarantee that professionally installed systems would be operated and maintained in accordance with the standards.

The number of offences detected per year is small in comparison with the likely number of audits and investigations. There are two possible interpretations of this relatively small number of offences. One interpretation is that the number of offences against the regulations is so small that the regulations may be unnecessary. Against this interpretation is the fact that some of these offences could result in serious risks to public safety (see Part 2.1 of this RIS).

The alternative interpretation is that the existing regulations have been successful in deterring a higher number of offences. Even where warnings are issued, the existence of the regulations and the possibility of an infringement notice or court summons underpins the effectiveness of the warning. Warnings are generally useless unless there are legal consequences for failure to heed them.

By using these methods, it has not yet been necessary to prosecute or issue any infringement notices for breaches of the existing regulations. In this way, the regulations provide an effective and necessary deterrent against non-compliance. The current high rate of compliance outcomes (that is, close to 100% after advice and warnings) is expected to be continued under the proposed regulations.

Given the high degree of public acceptance and compliance with the existing regulations, there is no reason to assume that the implementation of the proposed regulations is not feasible.

3.0 Identification of feasible options

The purpose of this part of the RIS is to identify practicable or feasible alternatives to the proposed regulations for comparative cost benefit assessment in Part 4.0 of the RIS. If alternatives are not practicable or feasible, then there is no point in considering them further in terms of costs and benefits.

The RIS is required to identify practicable alternatives to the proposed regulations and their relative costs and benefits compared to the proposed regulations (as quantitatively as possible, otherwise qualitatively). Conversely, the RIS is not required to identify alternatives which are not practicable, or which are beyond the scope of the existing Act. No alternatives are required to be identified, nor are costs and benefits required to be assessed where there is no appreciable cost burden imposed on any sector of the public.

The 'base case', that is, no regulations or other effective alternatives, while used for comparison purposes in Part 4.0 of this RIS, is not a practicable alternative because it would not contribute towards achievement of the policy objective (refer to Part 4.2 of this RIS).

Remaking the existing regulations without change is not a practicable alternative to the proposed regulations because the existing regulations no longer fit well with changes to the Act and other legislation made in the decade since the existing regulations were made,[33] and they do not meet current drafting methods and standards. In any case, the fees need to be recalculated in accordance with the latest cost recovery guidelines.[34]

3.1 Possible alternatives to non-fee regulations

Public education campaigns using television, radio and newspapers are sometimes a feasible alternative to regulations or codes of practice where the behaviour of a wide section of the community can be influenced by simple clear messages such as *'Don't smoke'*. However, such public education campaigns are not a practicable alternative where the messages are more complex and/or the target audience is more specific, as in the case of cathodic protection systems. There is only a small stakeholder group affected by the proposed regulations, namely the owners and operators of cathodic protection systems, consisting mainly of large multi-national companies. These stakeholders are already sufficiently well informed about the possible impact of their systems on third parties.

A **targeted education campaign** working alongside the Australian standards would not be sufficient for addressing the identified problems, because even full compliance with the standards would not be sufficient to address these problems, as discussed in Parts 2.1.1 and 2.1.2 of this RIS.

As discussed in Parts 2.1 and 2.3.2 of this RIS, the main areas of information failure relate to third party owners of metallic structures not knowing about the existence of nearby cathodic protection systems, which would not be remedied by education campaigns.

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[33] Refer to part 5.2 of this RIS.
[34] Department of Treasury and Finance, 2007.

As discussed in Part 5.1.2 of this RIS, there are sound technical reasons for the different categories of systems, that is, under 250mA, between 250mA and 2Amps and over 2 Amps. Variation of these thresholds would not be feasible alternatives.

A possible alternative, to vary the regulations by requiring owners of systems with an output greater than 250 milliamps to conduct audits of the operation of their systems on a less frequent basis than annually, was examined. This alternative was not considered feasible because the characteristics of the earth environment can change over time for a number of reasons, for example, a change in the operating output can indicate that there is something wrong in the area or that the system is not operating correctly. An audit is not an onerous activity; it involves checking that the system is operating at the correct current output (reading a meter on the unit and writing it down). Reducing the frequency of audits would thus not deliver material savings in administrative burden or other costs.

Some of the proposed regulations are **more prescriptive than performance-based**. Performance-based regulations are not suitable in all circumstances and are most suitable where flexibility and choice in solutions is desirable, to encourage innovation and efficiency. However, performance-based regulations can sometimes be more difficult to comprehend and can also be more difficult to enforce for evidentiary reasons. By their nature, performance-based regulations tend to focus on the resulting outcome of the activity in question, rather than taking action necessary to avoid or prevent such outcomes. As discussed in Part 2.1 of this RIS, the failure to take preventative action could have very serious and irreversible consequences, such as the loss of life or major property damage. An appropriate balance therefore needs to be struck between preferences for performance-based regulations, ease of comprehension and ease of enforcement.

As discussed in Part 2.1 of this RIS, there is no other legislation dealing with the identified problems relating to cathodic protection systems or mitigation systems. Thus there are no alternatives available involving the use of other legislation.

On the other hand, encouragement of voluntary compliance with the relevant Australian standards, instead of requiring compliance by regulation, could be a feasible option and this is listed below. The practical difference between voluntary and compulsory compliance with these standards is likely to be a reduction in the risk of non-compliance with the operation and maintenance aspects of the standards, rather than the design and installation aspects (refer to Part 2.1.1.2 of this RIS).

3.2 Possible alternatives to fee regulations

Although there is no alternative to setting fees by regulation, a practicable alternative could be possibly be to prescribe such fees based upon **partial cost recovery,** that is, at a level less than full cost recovery, if there are exceptional circumstances, in accordance with the relevant Treasury guidelines[35] (refer to Part 2.1.2 of this RIS).

One practical implementation issue considered, which would make cost recovery infeasible, is if the cost of fee collection were to exceed revenue collected. This would provide a justification for setting the fees at zero. However, the total cost of fee collection is estimated to be only $8,759[36] in 2008/09, which is estimated to be

[35] Department of Treasury and Finance, 2007.
[36] See Part A3.4 of Appendix 3 for source of estimate.

approximately 9% of annual revenue. The cost of fee collection is therefore not a ground for setting the fees at zero.

Full cost recovery is defined in the relevant Treasury guidelines as including the cost of law enforcement, notwithstanding that law enforcement is a public good (refer to Part 2.4 of this RIS). The recovery of law enforcement costs from registration fees is not infeasible, but requires consideration of its appropriateness and equity as an alternative to the proposed fees (refer to Option A1 below).

Apart from the question of law enforcement, the beneficiary of registration application services provided by ESV is, in every case, the applicant themselves. Also the sole beneficiary of a registered cathodic protection system is the owner of the system itself. Far from generating any social benefits, the use of cathodic protection systems has the potential to interfere with other assets (see discussion in Part 2.1.1.6 of this RIS). As there is no other 'public policy reason', or 'exceptional circumstance' for setting application fees at less than full cost recovery, there are no other practical alternatives to the proposed regulations on these grounds.

However, there are two different methods available under the Act for setting fees based on full cost recovery. The method adopted by the proposed regulations is to prescribe the actual fees in the regulations in terms of fee units, and to allow the annual increase in the fee units to keep pace with inflation. An alternative method allowed under the Act would be for the regulations to prescribe maximum fees, and for ESV to set the actual fees from time to time within the prescribed maximum levels. This alternative is one of the options listed below (refer to Option C1).

3.3 Feasible options

The proposed regulations and feasible alternatives (collectively termed 'options') to be considered for cost benefit assessment are:

Options relating to public safety, the environment and third party property damage

- **Option A:** encouragement of voluntary compliance with the relevant Australian standards (non-regulatory option); or
- **Option B**: the proposed regulations.

Options relating to fees

- **Option A1**: prescribed actual fees based upon full cost recovery, including law enforcement costs;
- **Option B1**: prescribed actual fees based upon full cost recovery excluding recovery of law enforcement costs; or
- **Option C1**: prescribed maximum fees, with ESV to set actual fees based on full cost recovery excluding recovery of law enforcement costs.

The preferred package of options will consist of one option from each of the above groups, that is, either Option A or Option B, plus either Option A1, B1 or Option C1.

4.0 Assessment of Costs and Benefits

4.1 Introduction

In this Part:

- the nature, incidence and distribution of costs and benefits associated with the proposed regulations are identified;
- the extent of costs and benefits of the proposed regulations are estimated in comparison with
    - the 'base case'; and
    - each of the options identified in Part 3.0 of this RIS; and
- the relative costs and benefits of each option are assessed against the policy objective identified in Part 2.2 of this RIS which is:

To facilitate the efficient and effective operation of the **Electricity Safety Act 1998**, *including ensuring:*

- *minimisation of risks to public safety, the environment and third party property from stray currents; and*
- *equitable recovery of the costs of efficiently providing services under the Act.*

The concept of 'fairness' or equity for the community and asset owners is implicit in these objectives.

The costs and benefits of the various non-fee options (A and B) are assessed by using the following criteria (**I + II**)[37] to compare the effectiveness of each non-fee option in achieving the relevant part of the policy objective:

I reducing risks to public safety, the environment and third party property; and

II non-fee compliance costs for asset owners and the community and enforcement costs to ESV.

The costs and benefits of the various fee options (A1 and B1) are assessed by using the following criteria (**III + IV**)[38] to compare the effectiveness of each fee option in achieving the policy objective

III compliance costs for asset owners in terms of fees; and

IV certainty for asset owners, equity for the community and flexibility for ESV.

A detailed discussion and estimation of costs and benefits is provided in Appendix 3 and 4 of the RIS.

4.2 The base case

The term 'base case' means the situation that would exist if the proposed regulations were not made. The base case provides the reference point for measuring the incremental costs and benefits of the proposed regulations and the other options. For

[37] These Roman numerals will be used to link the criteria to Tables 10 and 11 of this RIS.

this RIS, the base case is taken to be the situation of no regulations for cathodic protection.[38] Current regulations covering cathodic protection will be sunsetting on the 28th of April 2009.

Under the base case, the relevant regulations (including those which would normally prescribe cathodic protection systems and mitigation systems) would no longer exist. Therefore, there would be no way to facilitate the effective and efficient operation of sections 93, 96, 155 and 157 of the Act. The VEC (which is established by the Act) would continue to operate and endorse Australian Standards for cathodic protection systems and promote the reduction of stray current corrosion on a 'voluntary basis'. No cathodic protection systems would be registered and, therefore, no fees would be imposed or associated application or renewal costs would be incurred by ESV. Moreover there would be no other enforcement costs associated by ESV regarding cathodic protection.

For the purposes of this RIS, it is considered that although industry compliance with AS2832 (part 1, 2, 3 and 5) is likely to be very high,[39] under the 'base case'[40] the problems identified in Part 2.1 of the RIS would not be adequately addressed, namely there would be:

- inadequate protection of public safety and the environment and third party property; and
- no prescribed forms, notices or information requirements, preventing or inhibiting important applications being made and notices being issued under the Act.

4.3 Assessment of options

The following assessment of the costs and benefits of the proposed regulations and the other options is conducted by discussing each option in terms of its expected incidence and distribution of costs and benefits, relative to the base case. Some of the discussion of costs and benefits is by comparison with preceding options to avoid unnecessary repetition of text. The overall comparison of options and the selection of the preferred option is undertaken by using a weighted decision criteria analysis in Part 4.4 of the RIS.

4.3.1 Option A: The proposed non-fee regulations with a non-regulatory option regarding AS 2832 (Parts 1, 2, 3 and 5)

Option A consists of the proposed regulations as set out in Appendix 5 to this RIS – but without any regulation prescribing standards for the operation of cathodic protection systems under section 93(2) of the Act. That is to say *Regulation 16* under the proposed non-fee regulations would be removed and adherence to AS 2832 would become strictly voluntary.

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[38] Government of Victoria, 2007

[39] The assessment of a high rate of industry compliance with AS2832 is based upon advice from ESV and is discussed in detail under Section 2.1.1.2 in this RIS.

[40] The 'base case' is not an option in this RIS because it would not contribute towards the achievement of the policy objectives.

Quantifiable incremental cost of Option A (criterion II)

Under Option A, the 10-year[41] incremental net cost of non-fee regulations would be equal approximately ***$0.369m*** in 2008/09 present value dollars - as shown in the Table 4.

Table 4 – Summary of 10 year quantifiable costs of Option A in 2008/09 dollars[42]

Proposed regulation	Cost description	Cost imposed on	10-year cost	10-year PV cost
Reg.7,10 &15	Applying for cathodic protection system registration and renewals (time cost only)	Owners of cathodic protection systems	+$261,844.23	+$222,695.61
Reg.9	Providing additional information for new registrations for impressed current systems with an output greater than 2 Amps	Owners of new impressed current cathodic protection systems >2 Amps	+$1,774.08	+$1,508.84
Reg.13	Providing details of a change of name or address or of ownership	Owners of cathodic protection systems	+$246.40	+$209.56
Reg.17	Providing notice of operation for systems using impressed current	Owners of cathodic protection systems (using impressed current)	+$344.96	+$293.39
Reg.18(1)	One-off installation of time switch sockets for systems using impressed current	Owners of cathodic protection systems (10% of those who use impressed current and do not comply)	+$1,394.86[43]	+$1,394.86
Reg.18(2)	One-off installation of a short length of copper cable and test box – for systems using galvanic anodes	Owners of cathodic protection systems (1% of those who use galvanic anodes and who do not comply)	+$12,838.47[44]	+$12,838.47
Reg.19	Testing current and making records for a system >250mA	Owners of cathodic protection systems >250mA	+$152,570.88	+$129,760.30
Reg.20	Notification of modification or removal	Owners of cathodic protection systems	+$320.32	+$272.43
Net total 10-year cost			***$431,334.20***	***$368,973.46***

Unquantifiable incremental cost of Option A (criterion II)

Under *Regulation 11*, additional testing and/or modification costs would be incurred by owners of cathodic protection systems which could change the electric potential with respect to earth of other metallic structures, and who are refused registration. However this cost is unquantifiable, given that the incidence of testing and the physical dollar cost of modification remains highly variable and/or unpredictable.

[41] It should be noted that the life of regulations under Option A is limited to 10 years, by operation of section 5(1) of the **Subordinate Legislation Act 1994**.
[42] See Table A4.12 of Appendix 4 for source of estimates (less the cost of fees).
[43] One-off cost in 2008/09
[44] One-off cost in 2008/09

Unquantifiable incremental benefits of Option A (criteria I and II)

Option A would result in reduced risk to public safety and the environment, as well as, reduced risk to third party assets from stray currents and interference (Criteria I) in terms of:

- *Regulation 5(1)* and *5(2)* which prescribe cathodic protection systems and mitigation systems, respectively;
- *Regulations 7, 9, 10, 11, 12, 13, 14* and *15* which set out procedural requirements for registration of cathodic protection systems; and
- *Regulations 17, 18, 19,* and *20,* which deal with the notice of operation, provision of testing, audit by the owner, and notification of modification or removal of cathodic protection systems, respectively.

However, given that the operation of cathodic protection systems would not be regulated under Option A, and that owners of systems would be left to comply with AS 2832 only in a voluntary capacity[45] – any incremental benefits would be limited. Corporate owners of cathodic protection systems would be obligated under corporations law to act in the interest of shareholders. Given the choice between a lower return to capital (with more adherence to AS 2832) and a higher return to capital (with less adherence to AS 2832) – corporate owners would be legally obligated to pursue the latter.

Also, as discussed in Part 2.1.1.2 of this RIS, installed systems are designed by professional cathodic protection engineers. Design and installation compliance with the relevant Australian Standards is regarded as an indicator of professional competence. However, there is no guarantee that all cathodic protection systems would be operated and maintained in accordance with these standards on a voluntary basis.

The exemption of metallic structures that have internal cathodic protection under *Regulation 5(1)* (that is, tanks, internal surfaces of pipelines, domestic hot water services, and internal surfaces of ship hulls and metallic building structures) would save owners of such assets various fee and administrative costs[46] (Criteria II). While the number of structures with internal cathodic protection remains unknown, the level of cost savings would be in millions of dollars per annum[47].

Furthermore, *Regulation 8*, which exempts applications in terms of maps, drawings, consultation reports and fees, would result in an additional benefits (however unlikely) of anywhere up to ***$0.22m***[48] over 10 years in 2008/09 dollars (Criteria II). However the extent of administrative cost savings for owners of cathodic protection systems would be highly dependent on the extent of exemption over the next 10 years which remains unknown and unpredictable.

4.3.2 Option B: The proposed non-fee regulations

This Option consists of the proposed regulations as set out in Appendix 5 to this RIS.

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[45] Notwithstanding a high level of current compliance with AS 2832

[46] Costs of providing additional information; change of details; notice of operation; provision for testing; audits and reports; and notification of modification and removal of asset.

[47] According to ESV there are well over 1 million hot water service units alone in Victoria

[48] $222,695.61 (administrative costs (see Table A4.4)

Quantifiable incremental cost of Option B (criterion II)

As with Option A, under Option B the 10-year[49] the incremental net cost of non-fee regulations would equal approximately ***$0.369m*** in 2008/09 present value dollars - as shown in the Table 4.

Unquantifiable incremental cost of Option B (criterion II)

Option B is expected to result in a higher level of incremental unquantifiable modification costs under *Regulation 16*, as compared to Option A. Specifically, *Regulation 16* could result in additional modification costs for cathodic protection systems failing to comply with Parts 1, 2, 3, or 5 of AS 2832. However, the proportion of systems requiring such modification is expected to be low. As discussed in Section 2.1.1.2 in this RIS, the reasons provided for why compliance with AS 2832 is likely to be very high by both cathodic protection engineers (installers) and owners – are the same reasons why the proportion of systems requiring modification is expected to be low.

Unquantifiable incremental benefits of Option B (criteria I and II)

Option B would lead to a greater reduction of risk to public safety and the environment, as well as reduced risk to third party assets from stray currents and interference (criterion I) than under Option A. Under Option B, AS 2832 would be prescribed by *Regulation 16* and would relate to the operation of all cathodic protection systems relating to:

- buried or submerged metallic pipes or cables (Part 1);
- external surfaces of a compact buried structure (Part 2) or a fixed immersed structure (Part 3); and
- the protection of steel in concrete (Part 5)

Therefore, unlike Option A, Option B would ensure greater compliance with standards and further address the problems as discussed in Part 2.1 of this RIS. While it is acknowledged that there is a high degree of compliance with AS 2832, Option B would ensure that such compliance is enforced by regulation. The significance of enforcing compliance of standards by regulation deals at the very heart of the problem that a reduction in compliance by just 1% could potentially have very serious consequences (see more detailed discussion in section 2.1.1.2 of this RIS)

Finally, identical to Option A, further unquantifiable benefits would be obtained by owners of metallic structures with internal cathodic protection under *Regulation 5(1)* and by owners of cathodic protection systems which are given exemptions under *Regulation 8* (criterion II).

4.3.3 Option A1: Full cost recovery fees including law enforcement costs

Under the proposed fee regulations: (*Regulation 7 (fee for new applications); Regulation 10 (which sets a requirement for renewal of registration and associated*

[49] It should be noted that the life of regulations under Option A is limited to 10 years, by operation of section 5(1) of the **Subordinate Legislation Act 1994**.

fees after 10 years); and *Regulation 15 (fee for renewals)*) the following fee schedule would apply – as shown in Table 5, based on full cost recovery.

Table 5 – Schedule of registration/renewal fees under Option A1 (full cost recovery fees including law enforcement costs) – 2008/09[50]

Fee Category	Full cost recovery fees – 2008/09
Cathodic systems up to and including 250mA	**$115.94**
Cathodic protection systems > 250mA and up to 2Amps	**$265.49**
Cathodic protection systems > 2Amps	**$578.95**

Quantifiable incremental cost of fees under Option A1 (criterion III)

The cost of Regulations 7, 10 and 15, in terms of fees would be equal to approximately up to ***$1.01m***[51] over 10 years in 2008/09 present value dollars – as shown in Table 6.

Table 6 - Incremental 10-year cost of fees to owners of cathodic protection systems 2008-09 to 2017/18 in present value 2008/09 dollars[52]

Activity	10 year cost	10-year discounted[53] fee cost in present value 2008/2009 dollars
Cathodic protection systems up to and including 250mA	$396,074.89	$338,083.25
Cathodic protection systems > 250mA and up to 2Amps	$143,046.44	$122,102.18
Cathodic protection systems > 2Amps	$644,196.85	$551,517.59
Total fee cost	***Up to $1,183,318.18***	***Up to $1,011,703.02***

Equity, certainty and flexibility under Option A1 (criterion IV)

Option A1 would provide certainty for asset owners applying for new or renewed registration, as fees would only be increased according to movements in inflation (estimated to be an average of 3% per annum over the next 10 years).

However, holding law enforcement costs constant, where other costs of managing ESV cathodic protection registration activities increase by more than the average rate of inflation in a particular year, then ESV would recover its costs through 'other'

[50] For source of figures see Table A3.10 of Appendix 3

[51] Note that ESV may exempt fees under regulation 8 however the extent of exemptions over the next 10 years remains unknown. Exemption from fees relates to circumstances where cathodic protection systems are in geographic close proximity and protect a common structure (e.g. a single steel tank). Under such circumstances, scale economies exist in identifying the risk of such systems on the common structure in question. Therefore owners would pay a fee representing a 'group' of systems – as opposed to a fee for each system in proximity to a common structure being protected.

[52] For source of figures see Table A3.11 of Appendix 3

[53] A discount factor of 3.5% is used for present value calculations

means including *'industry levies' or 'other fees or charges'*[54]. Therefore, fee setting under Option A1 would not have any negative consequences regarding the financial viability of ESV operations. However Option A1 would, nonetheless, restrict the flexibility of fee setting and, putting law enforcement cost issues aside, could result in contributors to industry levies or 'other fees and charges' cross-subsidising owners of cathodic protection systems. This would potentially lead to diminished equity.

Even if the cost of managing ESV cathodic registration activities did not increase by more than the average rate of inflation, the recovery of law enforcement costs under Option A1 would lead to diminished equity given the public goods[55] nature of benefits of law enforcement from society's perspective. Under ideal conditions, an appropriate recovery of law enforcement costs amounting to approximately $7,500 per annum[56] would be from general taxation (i.e. consolidated revenue). However since ESV activities are not funded by consolidated revenue, law enforcement costs would have to be funded by either:

- broader 'industry levies' or 'other fees and charges'; or
- cathodic protection system registration fees

The recovery of law enforcement costs from cathodic protection system registration fees rather than broader sources of funding would result in the cross-subsidisation of a public good by applicants for registration. Such cross-subsidisation would be inequitable and inappropriate, as the beneficiaries of law enforcement are not the applicants for registration, but the wider community.

A further source of inequity in recovering law enforcement costs from cathodic registration fees, would involve the cross subsidisation of non-law abiding cathodic protection system owners by law abiding ones. This is because law enforcement cost would be recovered indiscriminately from all applicants for new and renewed registration.

4.3.4 Option B1: The proposed fees - full cost recovery (excluding law enforcement costs)

Under the proposed fee regulations: (*Regulation 7 (fee for new applications); Regulation 10 (which sets a requirement for renewal of registration and associated fees after 10 years);* and *Regulation 15 (fee for renewals)*) the following fee schedule would apply – as shown in Table 7, based on full cost recovery.

Table 7 – Schedule of registration/renewal fees under Option B1 (proposed fees) – 2008/09[57]

Fee Category	Proposed fee – 2008/09
Cathodic systems up to and including 250mA	**$99.51**
Cathodic protection systems > 250mA and up to 2Amps	**$249.06**
Cathodic protection systems > 2Amps	**$562.52**

Note: While presented here in dollar terms for ease of comprehension and comparison, the proposed fees are prescribed in terms of fee units in the proposed regulations.

[54] These relate to of other ESV services (not including cathodic registration services)
[55] See Part 2.3.2 and the glossary for definition of 'public goods'
[56] For source of estimate See Table A3.5 of Appendix 3
[57] For source of figures see Table A3.9 of Appendix 3

Quantifiable incremental cost of fees under Option B1 (criterion III)

The cost of Regulations 7, 10 and 15, in terms of fees would be equal to approximately up to ***$0.95m***[58] over 10 years in 2008/09 present value dollars – as shown in Table 8.

Table 8 - Incremental 10-year cost of fees[59] to owners of cathodic protection systems 2008-09 to 2017/18 in present value 2008/09 dollars – Option B1 (proposed fees)

Activity	10 year cost	10-year discounted[60] fee cost in present value 2008/2009 dollars
Cathodic protection systems up to and including 250mA	$339,943.32	$290,170.23
Cathodic protection systems > 250mA and up to 2Amps	$134,193.48	$114,545.43
Cathodic protection systems > 2Amps	$644,196.85	$549,876.22
Total fee cost	***Up to $1,118,333.65***	***Up to $954,591.88***

Equity, certainty and flexibility under Option B1 (criterion IV)

As with Option A1, Option B1 would provide certainty for asset owners applying for new or renewed registration, as fees would only be increased according to movements in inflation. However where costs[61] of managing ESV cathodic protection registration activities increase by more than the average rate of inflation in a particular year, then ESV would have to recover its costs through 'other' means including industry levies and other fees and charges (not including cathodic registration fees). Therefore, fee setting under Option B1 would not have any negative consequences regarding the financial viability of ESV operations. However Option B1 would, nonetheless, restrict the flexibility of fee setting and could result in members of the general energy industry cross subsidising owners of cathodic protection systems. This would potentially lead to diminished equity.

Option B1 would be more equitable than Option A1 in that law enforcement costs would not be recovered from registration fees, given the public goods nature of law enforcement as discussed in Part 4.3.3 of this RIS. Under ideal conditions, an appropriate recovery of law enforcement costs amounting to approximately $7,500 per annum would be from general taxation (i.e. consolidated revenue). However since ESV activities are not funded by consolidated revenue, law enforcement costs would have to be funded broader 'industry levies' or 'other fees and charges'.

4.3.5 Option C1: Full cost recovery (excluding law enforcement costs) with prescribed maximum fees

Under Option C1, application and renewal fees would be set at the maximum level of anticipated costs for ESV in 2017/18. ESV would annually set the maximum fees

[58] Note that ESV may exempt fees under regulation 8 however the extent of exemptions over the next 10 years remains unknown.
[59] For source of figures see Table A3.11 of Appendix 3 in this RIS.
[60] A discount factor of 3.5% is used for present value calculations.
[61] Excluding the cost of law enforcement

within this maximum level. Based on an increment of costs of 3%[62] over 10 years the maximum fees for new applications and renewals in 2017/18 including the cost of fee collection is summarised in Table 9. (This option is also based on full cost recovery excluding law enforcement costs).

Table 9 - Schedule of maximum application and renewal fees under Option C1 based on full recovery of costs (excluding law enforcement costs) in 2017/18

Fee Category	Max fee[63]
Cathodic systems up to and including 250mA	**$129.84**
Cathodic protection systems > 250mA and up to 2Amps	**$318.20**
Cathodic protection systems > 2Amps	**$733.20**

Quantifiable incremental cost of fees under Option C1 (Criteria III)

The cost of Option C1 would result in an amount up to between ***$0.95m*** and ***$1.09m***[64] over 10 years in 2008/09 present value dollars (see Table A3.13). The exact cost would depend on where ESV sets its fees over the next 10 years. Unlike the proposed fees in Option B1, a maximum fee option could result in ESV charging higher fees in any given year, than otherwise would be the case. That is to say if costs were to increase above 3% per annum then ESV would be likely to pass this on to applicants for efficiency and funding reasons. It is expected that costs over the next 10 years could, at times, exceed the average medium term inflation rate target of 3%.

Equity, certainty and flexibility under Option C1 (Criteria IV)

Option C1 would provide more flexibility for ESV because registration and renewal fees could be increased according to unforseen changes in ESV costs up to a maximum (see Table 7). Conversely, Option C1 would provide for less certainty for asset owners as fees could be set higher or lower than those under Option B1 depending on costs in a particular year.

Importantly, if the rate of inflation increase were greater on average than 3% per annum – then being 'locked into' a maximum fee[65] would jeopardise ESV's ability to recover all of its 10-year costs in relation to registration activities. Notwithstanding Reserve Bank policy with regards to inflation (that is, maintaining an average medium term rate under 3%[66]) – it is unknown how and to what extent existing policy on inflation might change over the next 10 years. If inflation were to rise above 3% then ESV would be 'locked into' the aforementioned maximum fees for 10 years and would have to recover any shortfall through other means including consolidated revenue from taxpayers. That is to say, if inflation were to rise faster than 3% per annum, particularly towards the end of the 10-year regulatory cycle, then ESV would not have the ability to increase fees more than the pre-determined maximum. Again, fee setting under Option C1 would not have any negative consequences regarding the

[62] This is assumed to be the average expected rate of inflation over the next 10 years.
[63] For source of fees see Part 3.8 of Appendix 3 in this RIS.
[64] The upper range of cost assumes that ESV would charge the maximum fee (as shown in Table 9) from the first year of the 10 year regulatory period.
[65] Derived on a basis of an increase in inflation of 3% per annum
[66] Reserve Bank (1996) '*Statement of Conduct of Monetary Policy*' states that the medium term average CPI inflation target would be between 2 to 3%.

financial viability of ESV operations. However Option C1 would be constrained by maximum fees and this could result in contributors to industry levies or 'other fees and charges', cross subsidising owners of cathodic protection systems. This would potentially lead to diminished equity.

4.4 Identification of preferred option

The purpose of this part of the RIS is to select a preferred option, on the basis of the preceding assessment of the various options in Part 4.3, by ranking the costs and benefits of the options, so as to identify the optimum combination of costs and benefits.

While the significant costs of the options can largely be quantified, some of the benefits, particularly in relation to Criteria I, cannot. However, both the costs and the benefits of the various options can be ranked against each other. Tables 10 and 11 rank the various options (non fees and fees options, respectively) in terms of both costs and benefits using a weighted decision criteria analysis. This is an accepted technique for ranking options and selecting a preferred option in an RIS.

The two evaluation criteria used in this analysis for non-fee options are:

I reducing risks to public safety, the environment and third party property; and

II non-fee compliance costs for asset owners and the community and enforcement costs to ESV.

The relative weightings of these two criteria are 60%, and 40% respectively, reflecting their relative importance in the decision-making process.

The two evaluation criteria used in this analysis for fee options are:

III compliance costs for asset owners in terms of fees; and

IV certainty for asset owners, equity for the community and flexibility for ESV.

The relative weightings of these criteria are 70% and 30% respectively, reflecting their relative importance in the decision-making process.

The rationale for the different scores in Tables 10 and 11 may be summarised as follows. For each of the criteria above, scores are assigned to each option on an ordinal scale of -3 to +3, based on the assessments of costs, benefits and equity given in the preceding Part 4.3 of the RIS, relative to the 'base case'. The 'base case' is assigned a score of zero for each of the criteria. If the option has been assessed as superior to the 'base case' for a particular criterion, it is assigned a positive score, and if it has been assessed as inferior to the base case, it is assigned a negative score. It is emphasised that the different scores are assigned on an ordinal rather than a linear scale, as the purpose of the exercise is simply to rank the options. In other words, an option with a score of +3 is not necessarily 3 times superior to an option with a score of +1. The method simply means that an option with a score of +3 is superior to an option with a score of +2, which in turn is superior to one with a score of +1.

For example, the option that would be likely to provide the highest level of public safety, environment and third party protection (Criterion I) relative to the 'base case' (Option B – the proposed regulations) is assigned a score of +3. As Option A (the

proposed regulations without prescribed standards) would be likely to provide lower levels of benefits it is assigned a lower score accordingly.

Option A receives a higher score under Criterion II (-1) because it results in lower net costs. Option B receives a score of only -2 because there are additional, although unquantifiable, modification costs associated with the inclusion of *regulation 16.*

The assigned scores are then multiplied by the relevant weightings for each criterion, as discussed above, to calculate the weighted score for each option.

Table 10 - Weighted criteria decision analysis – non fee options

Criteria	Type of score	Reduced risks to public safety, the environment and third party property damage Criterion I	Costs of compliance for asset owners, the community and enforcement costs for ESV Criterion II[67]	Total score
Weighting	**%**	60	40	**100**
Base case	*Score*	0	0	**0**
Options relating to public safety, the environment and third party property damage				
Option A	Assigned score[68]	+1	-1	+0
	Weighted score	***+0.6***	***-0.4***	***+0.2***
Option B	Assigned score	+3	-2	+1
	Weighted score	***+1.8***	***-0.8***	***+1***

Based on Table 10 (the non fee options), Options A and B (the proposed regulations) provide weighted scores of **+0.2** and **+1,** respectively. **The proposed non-fees regulations (Option B) have the greatest net benefits, and are therefore the preferred option.**

Amongst the fees options in Table 11 – Option B1 would result in a lower level of fee costs over 10 years for asset owners and is assigned a score of -1. Option A1 would result in a slightly higher level of fee costs over 10 years for asset owners and is assigned a score of -2. Option C1 is likely to result in a highest level of fee costs (as fees would potentially be set higher in any given year as compared to Option B1 or A1) and is therefore assigned a score of -3. Options A1 and B1 provide for more certainty for asset owners but provides less flexibility for ESV. Conversely, Option C1 provides for more flexibility for ESV but less certainty for asset owners. Options A1, B1 and C1 would both result in similar potential for additional funding by the energy industry, in general, in the event that unexpected changes in costs or inflation were to occur (not withstanding law enforcement costs). However A1 would result in reduced equity as compared to B1 or C1 due to the need to recovery law enforcement costs from cathodic protection registration fees and due to the result of having law abiding registrants cross subsidising non-law abiding ones. Subsequently, given the importance of stability and certainty in the business environment, Option B1 is given

[67] (-) cost / (+)cost savings.
[68] (-3 to +3).

a higher score of +2 with Option C1 given a score of +1, whilst A1 is given the lowest score of -1.

Table 11 - Weighted criteria decision analysis – fees options

Criteria	Type of score	Costs of compliance for asset owners Criterion III[69]	Certainty for asset owners, equity for the community and flexibility for ESV Criterion IV	Total score
Weighting	**%**	70	30	**100**
Base case	*Score*	0	0	**0**
Options relating to fees				
Option A1	Assigned score	-2	-1	-3
	Weighted score	***-1.4***	***-0.3***	***-1.7***
Option B1	Assigned score	-1	+2	+1
	Weighted score	***-0.7***	***+0.6***	***-0.1***
Option C1	Assigned score	-3	+1	-1
	Weighted score	***-2.1***	***+0.3***	***-1.8***

Based on Table 11, Options A1 (full cost recovery including law enforcement costs) B1 (full cost recover excluding law enforcement costs - the proposed regulations) and C1 (full cost recover excluding law enforcement costs and maximum fees) provide weighted scores of **-1.7, -0.1** and **-1.1,** respectively. **The proposed regulations, B1, have the lowest net cost, and are therefore the preferred option.**

[69] (-) cost / (+)cost savings.

5.0 Nature and effects of preferred option

5.1. Explanation of proposed regulations

This Part of the RIS describes the nature and likely effects of the proposed regulations. Changes from the existing regulations are discussed in Part 5.2

5.1.1 Part 1—Preliminary

Part 1 states the formal objectives of the proposed regulations, which are—

> (a) to prescribe cathodic protection systems and mitigation systems for the purposes of the Act; and
>
> (b) to prescribe standards for the operation of cathodic protection systems; and
>
> (c) to provide procedures for the registration of cathodic protection systems; and
>
> (d) to protect metallic structures from damage associated with stray current corrosion and interference from cathodic protection associated with other metallic structures in the vicinity; and
>
> (e) to make a related consequential amendment to the Electricity Safety (Infringements) Regulations 2000.

It also cites the provision of the Act that authorises the making of the proposed regulations (see Part 1.2.4.2 of this RIS). As it is intended that the proposed regulations will replace the Electricity Safety (Stray Current Corrosion) Regulations 2009, it is also necessary for this Part to revoke those regulations.

This Part defines various specific terms used in the proposed regulations.[70] In particular, new definitions are needed to include additional parts of AS2832 and to define the term 'registered cathodic protection system'.

Proposed regulation 5 in effect defines cathodic protection systems and mitigation systems for the purposes of the Act.

The definition of a cathodic protection system clarifies a 'system' as a connection to a single point, which aligns with current practice. An exemption is made for structures that would have internal surface cathodic protection (including things like domestic hot water heaters etc) that would have been otherwise been included in 5(1) and would have imposed an enormous cost in terms of needing to be registered.

The internal surfaces of metallic containers that require cathodic protection to the internal surfaces of the structure effectively contain the effects of the cathodic protection to within the structure. As the affects of the cathodic protection are contained within the structure the cathodic protection will not affect other parties or structures. This is quite different to cathodic protection installed to protect the outer surfaces of a metallic structure. Metallic structures that have internal cathodic protection include but are not limited to the following examples:

- metallic tanks (including domestic water tanks to large multi mega litre storage tanks);

[70] It should also be noted that definitions specified in the Act apply to regulations made under the Act.

- internal surfaces of pipelines (including the Latrobe Valley waste water fallout and the cooling water pipelines for Newport Power station);
- domestic hot water services (both gas and electric); and
- internal surfaces of ship hulls and metallic building structures.

The number of these types of structures is enormous, with well over 1 million hot water units alone in operation within Victoria.

Proposed regulation 6 saves the registration of existing CPSs >2A for 10 years or until withdrawn under proposed regulation 14. Other CPSs are registered until withdrawn under proposed regulation 14. Higher current systems require review after 10 years.

5.1.2 Part 2—Registration of cathodic protection systems

This part of the proposed regulations specifies the requirements for applications to register CPSs. The relevant registration fee must accompany the application.

The information required for such applications would be already available to applicants, except for systems with a total output greater than 250 milliamps[71] which are required to include a report on all consultations carried out between the applicant and owners of metallic structures. The proposed regulations enable ESV to waive the requirement to submit maps and drawings, for example, if ESV already has them; or the requirement to consult, for example, if the system is in a remote area. ESV may require further information from the applicant where necessary.

For systems with an output greater than 2 amperes,[72] registration is for ten years or until withdrawn under regulation 14. This allows more powerful systems to be reviewed every ten years, and less powerful systems to be registered indefinitely, provided that the registrant complies with the Act and Regulations.

Registration may be refused until testing or modifications are carried out to the satisfaction of ESV.

ESV is required to keep a register of certificates and details of any changes to registration.

Registrations may be renewed by application to ESV at any time before the registration is due to expire. Applications for renewal are treated as new registrations in terms of the information required.

Current owners of cathodic protection systems are informed by three different methods when a new system is going to be installed and the location of that system. For systems operating at greater than 2 amps, they are notified by the applicant. Owners of other systems may search ESVs register. Owners are involved in Area Testing and are informed of the results.

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[71] Systems with outputs less than 250 milliamps tend to use galvanic anodes. Above this threshold, impressed current systems tend to be used, which can be varied during operation and therefore require consultation.

[72] The 2 ampere threshold was selected as the point where systems begin to require closer monitoring and scrutiny because the damage which can potentially be caused by these powerful systems is much greater. Conversely, it is also undesirable to over-regulate the systems which cause potentially less damage.

5.1.3 Part 3—Operation of cathodic protection systems

The proposed regulations prescribe the following standards:

- AS 2832 Cathodic protection of metals Part 1: Pipes and Cables;
- AS 2832 Cathodic protection of metals Part 2: Compact buried structures;
- AS 2832 Cathodic protection of metals Part 3: Fixed immersed structures; and
- AS 2832 Cathodic protection of metals Part 5: Steel in concrete structures.

The existing regulations prescribe only Part 1 (Pipes and Cables) of this Australian Standard for all structures, which is clearly inappropriate. The existing regulations have essentially failed to keep pace with the development of new standards.

The effect of the proposed regulations is that the above standards must be complied with, except where the registrant applies for and is granted a modification to the standards by ESV. The costs of testing are negligible as the applicants (together with the affected asset owners) should be conducting these tests anyway. Modifications are generally minor and involve adjusting the settings on the impressed current system or installing a bond between underground structures.

The owner of a registered cathodic protection system that uses impressed current must give ESV at least five business days notice of intention to commence operation of the system. This is to enable ESV to test the operation of the system, should it wish to do so. Owners are required to install specified mechanisms to enable such testing.

Owners of systems with an output greater than 250 milliamps are required to conduct an annual audit of the operation of their systems, to record the results and to make such records available to ESV or other persons likely to be affected.

Modifications or removals of systems with a total output of more than 250 miliamperes must be notified to ESV.

5.1.4 Part 4—Infringement notices

This part of the regulations in effect revokes the relevant parts of the of *Electricity Safety (Infringements) Regulations 2000* And defines provisions of the proposed regulations for which infringements may be served. It also includes a new infringement offence for a breach of regulation 13(1).

It needs to be kept in mind that the fixing of an infringement penalty does not impose any obligation on the defendant. It is merely an option given to the defendant. The defendant can choose to pay the lesser fine set out on the infringement notice, or the defendant can choose to defend the matter in court and take the risk of a more severe penalty if he or she loses the case. If there were no infringement notices, all offences against the regulations would have to be prosecuted in the courts. This would deny opportunities for significant savings of time and expense to defendants, the prosecution, witnesses and the court system generally.

5.2. Changes from existing regulations

Although the base case for the evaluation of the proposed regulations is to have no regulations, the following comparisons with the existing regulations may be of assistance to interested stakeholders.

A summary comparison of the substantive differences (other than wording and changes of penalty) between the existing regulations and the proposed new regulations is given in Appendix 2 to this RIS. The more significant changes are in three main areas:

1. a transfer of obligations from operators to owners of cathodic protection systems,
2. the recalculation of fees, and
3. the omission of regulations requiring the registration of mitigation systems.

5.2.1 Transfer of obligations from operators to owners

The transfer of obligations from operators to owners of cathodic protection systems derives from recent amendments to section 93 of the Act.[73] The current Act commenced at a time when the owner and the operator of cathodic protection systems on government owned utilities were almost always one and the same (that is, the government). Since restructuring of Government-owned utilities, there has been in many instances a separation between the owners of particular cathodic protection systems and those who maintain and operate those systems. Therefore, in some cases the operator and the owner will be the same person, but in many cases, the operator and the owner will be two different entities (that is, there is a division between the owner and the operator). The use of external contractors for the operation of cathodic protection systems on privately-owned underground structures (for example petroleum industry pipelines) has been common for many years.

Given that in many cases the operator is separate from the owner, the following issues arise:

- the operator, who is prohibited from operating a cathodic protection system unless it is registered, has no way of knowing at any given time whether or not the system is in fact registered (as the certificate is issued to the owner);
- as any conditions are recorded on the certificate of registration, the operator must rely on the owner to inform them of what the operating conditions are (if any);
- as the maintenance of the registration is the responsibility of the owner, the operator will have to rely on the owner to inform them if the registration has either lapsed, or been withdrawn.

Even though these issues have been successfully managed through the cooperation of all parties to date, from the viewpoint of liability for the offences in section 93 the above problems need to be adequately addressed in the legislation. It is not desirable

[73] Refer to section 6 of the **Energy and Resources Legislation Amendment Act 2008**.

that an operator's liability depend on the action or inaction of another person, i.e. the owner.[74]

5.2.2 Recalculation of fees

The proposed fees are compared with existing fees regulations in Table 12.[75] (These fees are in dollars for ease of comprehension – the fees in the regulations have been converted to equivalent fees units).

Table 12 – Comparison of proposed registration/renewal fees under Option B1 with fees under sunsetting regulations

Fee Category	Sunsetting fees	Proposed fees (Option B1)	% change (+/-)
Up to and including 250mA	**$125**	**$99.51**	**-20.39%**
> 250mA and up to 2Amps	**$250**	**$249.06**	**-0.38%**
> 2Amps	**$500**	**$562.52**	**+12.50%**

5.2.3 Registration of mitigation systems

When the existing regulations were proposed in 1999, there was concern that the hitherto existing voluntary scheme in relation to mitigation systems might break down as the various underground structure owners change from public to private ownership and become more competitive. Provision was therefore made in the existing regulations for the registration of mitigation systems. However, the breakdown of the voluntary scheme has not eventuated and Part 3 of the existing regulations is now redundant. It is considered that the powers contained in the Act offer enough protection should any problems arise. In addition, a registration scheme to ensure that stakeholders are notified of the installation of a new system is not particularly appropriate for mitigation systems and, if implemented, could be considered to be overkill. This is because:

- the need for a new mitigation system is almost always identified during the area tests co-ordinated by the Technical Sub-Committee of the VEC (TSC),
- installation of new mitigation systems are co-ordinated by the TSC,
- the physical installation of the new mitigation systems directly involves the immediately affected asset owners, and
- any indirectly affected asset owners are represented on the TSC and the VEC.

5.3. Impact on small business

Where the costs of compliance with regulations comprise a significant proportion of business costs, small businesses[76] may be affected disproportionately by such costs compared to large businesses.

However, in this case, the proposed regulations primarily impose costs on large businesses rather than on small businesses. Some small business may be required to register cathodic protection systems, for example, independent or franchised petrol stations. No information is available on the proportion of registrants that are small

[74] Energy Safe Victoria, 2007b
[75] Refer to Appendix 3 for fee calculations.
[76] The Australian Bureau of Statistics (ABS) definition of a small business is one that has less than 20 full-time employees.

businesses. In any case, the costs imposed by the proposed regulations, including fees, are unlikely to comprise a significant proportion of business costs (refer to Part 4.3 of this RIS).

5.4. Impact on administration burden

The proposed changes in the regulations would impose minimal administrative burdens on business and not for profit organisations, which is less than the $250,000 per annum threshold required by Government guidelines for the measurement of change in administrative burden.[77]

The following 'increases/reductions' in administrative burden have been identified in comparing the proposed regulations with the existing regulations.

1. Under proposed regulation 7(3)(e)(iii) when applying for registration of a cathodic protection system over 250mA, the applicant must also include the names, addresses and telephone numbers of the metallic structure owners consulted as well as the dates each of the metallic structure owners were consulted. That is, this applies to metallic structures owners who are likely to be affected by stray current from that system. As applicants are required to consult these owners as part of the application process (both under the existing and proposed regulations), this information should already be available. Consequently, this specific change in regulation will have minimal/negligible additional costs to business.

   For the additional burden for business to exceed $250,000 this change would necessitate each of the annual 147 new applicants/renewals spend an average of $1,700 to meet this requirement – an unrealistic amount. Moreover, it is highly unlikely that such information would not already be included in the consultation report as required by both the existing and proposed regulations.

   If the time cost of including the aforementioned items were up to 5 minutes per registration/renewal then the total administrative burden for all applicants for the year to include the aforementioned information would be up to only $594.25 (or $4.05 per applicant):

   5 minutes/60 minutes x $48.51[78] x 147 (applications) = $594.25

2. The final significant change in regulation is the removal of regulations relating to mitigation systems under Part 3 of the existing regulations. To the extent that the removal of this set of regulations has reduced the burden to business, this will subsequently offset any additional burden costs to business. The number of new mitigation systems is approximately eight per year. However, this number can be boosted by the construction of new train/tram lines or the electrification of an existing line. Therefore, the 'actual' number of new mitigation systems in any one year can vary and remains unquantifiable. The costs involved with the electrolysis infrastructure for these stray current mitigation systems are covered by the project, and therefore create no cost to the underground structure owners/business.

3. The existing regulations refer to 'a person applying to the Office[79] for

[77] State Government of Victoria, 2007

[78] See section A4.2 of Appendix 4 in the RIS for source of estimate.

[79] The Office of the Chief Electrical Inspector was the predecessor of ESV for the purpose of the existing regulations.

registration of a mitigation system' and then the Office 'granting a Certificate of Registration' to each person whose metallic structure is to be connected to the system. This does not happen in practice, as the VEC (via the TSC) ratifies all new mitigation systems and the records relating to these systems are kept by ESV. Consequently, there is little impact on business from the removal of these regulations.

Finally, it is concluded that there will be no substantial burden imposed by increased population figures as these have remained unchanged over the period and are expected to remain stable. For these reasons, it is our contention that the burden to business as a result of the proposed changes to regulation will not exceed $250,000.

5.5. Comparison with other jurisdictions

A comparison of the burden of the proposed Victorian regulations with equivalent regulations in other Australian states and territories is as follows.

New South Wales

The *Electricity Safety (Corrosion Protection) Regulation 2008* applies to all corrosion protection systems, except those with an output of less than 150 milliamps, or to marine vessels and to the internal surfaces of water storage tanks, reservoirs or other similar structures for storing water.

The operation of corrosion protection systems requires government approval, and the requirements for applications are broadly similar to those in Victoria, including consultation requirements. Approvals are subject to conditions imposed by the regulator, which could include compliance with the relevant Australian Standards, although these standards are not expressly referred to in the regulations. Fees are set by the regulator, rather than by regulation.

Approvals may be suspended or cancelled on similar grounds as in Victoria. Systems are subject to testing and notification is required for the sale or removal of systems.

Queensland

The *Electrical Safety Regulation 2002* (Part 11) applies to all cathodic protection systems except those installed on--

(a) a floating mobile structure; or

(b) fishing equipment; or

(c) a fixed off shore structure not connected with land above sea level; or

(d) an internal surface of an apparatus, structure or item of equipment to which AS 2832.4 (Cathodic protection of metals--Internal surfaces) applies.

The owner of a cathodic protection system must not operate the system unless -

(a) the system has been tested in accordance with prescribed testing requirements; and

(b) each foreign structure owner for the system has stated either that interference mitigation is satisfactory or that it is not required; and

(c) the system is operated in accordance with the requirements of AS/NZS 2832.1 (Cathodic protection of metals--Pipes and cables); and

(d) if the system is a registrable system - the system is currently registered, and is operated in accordance with the requirements of the conditions of its registration.

Impressed current cathodic protection systems with an output greater than 0.25A are required to be registered. Other systems are required to comply with various technical conditions specified in the regulations.

The requirements for applications for registration are similar to those in Victoria, except that no consultation of third parties is required. The period of registration is for five years, unless it is earlier cancelled. Registrations may be cancelled for non-compliance with the regulations. Registration fees are $233.30 for all systems, which approximates the proposed Victorian fee of $248.05 for a medium output system.

South Australia

The *Electricity (General) Regulations 1997* (Part 5) do not apply to a cathodic protection system—

(a) installed on any floating mobile structure, fishing equipment, fixed off shore structure (not connected with land above sea level) or internal surface of any apparatus, equipment or structure; or

(b) using only galvanic anodes.

The owner or operator of a cathodic protection system must ensure that it does not adversely affect the integrity or safety of any electricity infrastructure or supply system through corrosion. The owner or operator of a system that has an anode immersed in water or a marine environment must perform tests before operation to ensure that the potential difference between any two accessible points spaced one metre apart in the water or marine environment is not more than 3V when the system is energised.

As there is no registration or approval of cathodic protection systems in South Australia, no fees are payable.

Tasmania

Under S71 of the **Electricity Industry Safety and Administration Act 1997,** if an authorised officer finds that a cathodic protection system or the operation of a cathodic protection system does not comply with the general safety requirements of the Act, the authorised officer may take reasonable action, or require the person in charge of the system to take reasonable action, to make the system inoperable.

There are no equivalent regulations in Tasmania. As there is no registration or approval of cathodic protection systems, no fees are payable.

Northern Territory

The *Electricity Reform (Safety & Technical) Regulations* (Part 10) apply to all cathodic protection systems, except those -

(a) installed on any floating mobile structure, fishing equipment, fixed off shore structure (not connected with land above sea level) or internal surface of any apparatus, equipment or structure; or

(b) using only galvanic anodes.

The owner or operator of a cathodic protection system must ensure that it does not adversely affect the integrity or safety of any electrical installation or supply system through corrosion. The owner or operator of a cathodic protection system that has an anode immersed in water or a marine environment must before starting to operate the system, perform tests to ensure that the potential difference between any two accessible points spaced one metre apart in the water or marine environment is not more than 3V when the system is energised.

As there is no registration or approval of cathodic protection systems in the Northern Territory, no fees are payable.

Western Australia and the Australian Capital Territory

There are no equivalent regulations in either Western Australia or the Australian Capital Territory. Western Australia has a few electrified suburban railway lines; however, they operate on alternating (AC) current which does not cause damage to the same severity as DC current. The ACT has no electrified traction systems.

Comparison

The burden of the proposed Victorian regulations is similar to that of the equivalent Queensland regulations.

The burden is potentially less onerous than the equivalent New South Wales regulations. NSW fees and approval conditions are determined by the regulator, rather than prescribed by regulation. The NSW fees may not be based on cost recovery, and the approval conditions imposed by the regulator are potentially more onerous than those in Victoria. For example, while NSW excludes some galvanic systems that operate at 150 milliamps or less, NSW requires all systems that operate above 150 milliamps to re-register every seven years. In contrast, the proposed Victorian regulations do not require any system operating below 2 amperes to re-register and in the case of systems operating at more than two amperes, these systems are only required to re-register every ten years. (The higher the output the higher the potential for damage and the larger the damage would be. New South Wales and Victoria have conducted their own risk assessments, and have decided to manage the risks in slightly different ways).

However, the burden of the proposed Victorian regulations is likely to be more onerous than in South Australia, Tasmania, Northern Territory, Western Australia and the Australian Capital Territory. The main reason for this difference is that the primary source of stray currents is DC traction systems. The chief reason for installing a cathodic protection system (which also can generate stray currents) is to protect an underground asset from the stray currents generated by the DC traction systems.

While NSW does have a DC traction system, it does not compare in concentration and complexity to that of Victoria. Victoria has approximately 617 km of electrified lines (train and tram) while NSW has approximately 1,700 km of electrified lines (train only). Victoria's network is densely concentrated with 16 train lines and 28 tram routes mostly within 30 km of the CBD, and often intersecting with each other. The NSW network consists of 12 train lines, some of which are 90 to 100 or more km away from the CBD. Clearly, the characteristics of the two DC traction systems differ. Due to the complexity of the Victorian network and its close proximity to the densest concentration of underground assets, the earth under Melbourne's CBD is crowded and requires close attention and careful solutions in order to prevent damage.

Any attempt to mitigate the stray currents from traction systems could be frustrated by cathodic protection systems, if they are unknown and not taken in to account when devising mitigation solutions.

6.0 National Competition Policy tests

6.1 Competition principles and guidelines

At the Council of Australian Governments (COAG) meeting in April 1995 (reaffirmed in April 2007), all Australian governments agreed to implement the National Competition Policy (NCP). As part of the *Competition Principles Agreement*, all governments, including Victoria, agreed to review all legislation containing restrictions on competition under the following principle:

> The guiding principle is that legislation (including Acts, enactments, Ordinances or regulations) should not restrict competition unless it can be demonstrated that:
>
> (a) the benefits of the restriction to the community as a whole outweigh the costs; and
>
> (b) the objectives of the legislation can only be achieved by restricting competition.[80]

To successfully pass the competition and cost-benefit tests, for each proposed regulation it is necessary to:

- Step 1: Identify the restriction on competition, if any;
- Step 2: Show that the restriction, if any exists, is necessary to achieve the objective;
- Step 3: Assess the costs to the community caused by the restriction;
- Step 4: Assess the community benefits; and
- Step 5: Assess whether benefits outweigh the costs.

If no restriction on competition is found in the course of Step 1, it is not necessary to complete the remaining steps (that is, Steps 2 to 5). Issues to be discussed in the NCP assessment relate to whether or not the proposed regulations restrict competition in the relevant market by one or more of various means such as:

- allowing only one company or person to supply a good or service (monopoly);
- requiring producers to sell to a single company or person (monopsony);
- limiting the number of producers of goods and services to less than four (duopoly or oligopoly);
- limiting the output of an industry or individual producers; or
- limiting the number of persons engaged in an occupation.[81]

6.2 NCP assessment

The relevant markets affected by the proposed regulations are in essence those where owner/businesses utilise cathodic protection for metallic structures (that is, for their capital assets). There are currently 658[82] owners of cathodic protection systems in Victoria operating in various markets including gas, water, electricity, golfing, supermarket retail, telecommunication, tyres, tertiary education, baked goods, nurseries, health, ice-cream, vehicles, paint, petrol – to name just a few. For some

[80] COAG, 2007
[81] State Government of Victoria, 2005.
[82] Based on advice from ESV.

'public' organisations which have registered cathodic protection systems such as the Department of Defence (Army), Victoria Police, VicRoads and various councils – competition is not a relevant issue.

All businesses utilising cathodic protection systems (of equal type) would be equally affected by the same regulatory environment. The proposed regulations would impose the following costs:

- the administrative and fee costs for cathodic protection system applications both new and renewals (*regulations 7, 10* and *15*). For applications under 250mA the administrative cost of applications would only be ***$24.25***[83]. For applications over 250mA the administrative cost of applications (including consultation) would be ***$96.94***. The fee cost would be ***$98.50*** (up to and including 250mA); ***$248.05*** (>250mAand up to 2 Amps); or ***$561.52*** (>2 Amps).
- the administrative cost of providing further information for impressed current systems with an output greater than 2 Amps (***$145.53***) (*regulation 9*);
- the cost of testing and modification of cathodic protection systems in the event that ESV refuses registration (*regulation 11*). This cost is unquantifiable as the frequency and extent of testing and modification remains unknown (see next page). However this is not expected to limit competition;
- the administrative cost of providing details of change of a cathodic protection system (***approximately $5***) (*regulation 13*);
- modification costs to applicants of cathodic protection system registration that fail to meet AS 2832 (*regulation 16*); This cost is unquantifiable as the frequency and extent of modification remains unknown however it is noted that there are very few applications for approval of modified structures which are unsuccessful. However this is not expected to limit competition;
- the administrative cost of providing notice of operation for use of impressed current systems (***approximately $4***) (*regulation 17*);
- the cost of testing systems using impressed current (***$15***) (*regulation 18(1)* and galvanised nodes (***$100***) (*regulation 18(2)*);
- audit cost of systems greater than 250mA and costs of making records available to ESV (***$72.77***) (*regulation 19*); and
- the administrative cost of notification of modification or removal of a cathodic protection system (***approximately $4***) (*regulation 20*);

The aforementioned quantifiable costs arising from *regulations 7, 10, 15, 9, 13, 17, 18(1), 18(2), 19 and 20* would constitute only a very small fraction of the annual turnover of each business. Therefore, they would not restrict competition by creating a barrier to the entry of new businesses and are unlikely to restrict competition.

With regards to *regulation 11* and *regulation 16* - the costs remain unquantifiable. However the frequency of costs arising from *regulation 16* is expected to be very low given the fact that there are very few unsuccessful applicants for systems which do

[83] All costs in Part 6.2 of this RIS are discussed per individual protection system and for 2008/09.

not meet AS 2832. *Regulation 11* (which involves testing and modification costs) only relates to registrations which are refused by ESV, and, again, are expected to be not significant in number. There are approximately 17 registrations refused per annum (that is, approximately 50% of the impressed current applications over 250mA).[84] However refusal of registration itself would not constitute a barrier so long as a proponent would be willing and able to engage in testing and modification and in doing so meet the requirements for registration. Therefore it is the cost of testing and modification in the event of refusal which would be the real imposition of cost and could potentially constitute a barrier to entry. However, in this case, the incremental costs of testing are negligible as the applicants (together with the affected asset owners) should be conducting these tests anyway. No data is available on the costs incurred by owners of cathodic protection systems in the modification of systems. However, the required modifications are generally minor and involve adjusting the settings on the system or installing a bond between underground structures.[85]

Consequently it can be said that the proposed regulations would not constitute a barrier to entry in any markets where businesses use cathodic protection. The proposed regulations are therefore unlikely to restrict competition.

Given that the ESV is the only organisation which can undertake cathodic protection system registration activities in Victoria - the competitive neutrality principle that is, the need for fair competition with other private sector businesses in the same market, does not apply.

[84] Based on advice from ESV
[85] Based on advice from ESV

7.0 Evaluation strategy

The proposed regulations represent a continuation, with limited amendments, of a regulatory framework that has been in place in the corrosion industry in Victoria for more than a decade. Consequently, ESV (together with the VEC and its sub-committees) has developed substantial experience in the implementation of these regulatory arrangements. Moreover, the participation of stakeholders as members of the VEC and its sub-committees provides the basis for a systematic evaluation of this experience.

In this context, it is considered unlikely that substantial evaluation efforts in respect of the proposed regulations are or will be required in the short to medium term. However, ESV expects to continue to adopt a collaborative and interactive approach in its relations with stakeholders and to use these relationships to identify any emerging regulatory issues and evaluate the ongoing performance of the regulations.

The effectiveness of the proposed regulations in achieving the policy objective (refer to Part 2.2) and any unintended consequences will be evaluated over time using the following indicators:

- incidence and severity of safety problems;
- level of compliance with regulations; and
- maintenance of stakeholder acceptance of regulations.

8.0 Conclusions

A summary of the main findings and conclusions of the RIS is as follows:

1. If there were no relevant regulations or effective alternatives to regulations, several significant problems would be likely to arise, including:
    - Risks to public safety, the environment and property of third parties;
    - Efficiency problems, including a lack of exemptions from registration requirements;
    - Inadequate cost recovery, necessitating cross-subsidisation of owners of cathodic protection systems by taxpayers or others.
2. To address these problems, the following overarching policy objective is identified:

    To efficiently minimise risks to public safety, the environment and third party property from stray currents; and where appropriate, to equitably recover the costs of efficiently providing services under the Act.
3. The options considered in the cost benefit assessment were:

    Options relating to public safety, the environment and third party property damage

    - Option A: encouragement of voluntary compliance with the relevant Australian standards (non-regulatory option); or
    - Option B: the proposed regulations.

    Options relating to fees

    - Option A1: prescribed actual fees based upon full cost recovery, including law enforcement costs;
    - Option B1: prescribed actual fees based upon full cost recovery excluding recovery of law enforcement costs; or
    - Option C1: prescribed maximum fees, with ESV to set actual fees based on full cost recovery excluding recovery of law enforcement costs.
4. For both Options A (voluntary compliance with the Australian standards) and Option B (the proposed regulations), the 10-year incremental net costs of non-fee regulations would be equal approximately $0.369m in 2008/09 present value dollars. However, Option B would lead to a greater reduction of risk to public safety and the environment, as well as reduced risk to third party assets from stray currents and interference (Criteria I) than under Option A.
5. The total cost of these fees to owners of cathodic protection systems would be equal to approximately up to $0.95m over 10 years in 2008/09 present value dollars. The cost of Option C1 (prescribed maximum rather than actual fees) would result in an amount possibly greater than $0.95m (that is, up to between $0.95m and $1.09m) over 10 years in 2008/09 present value dollars. The exact cost would depend on where ESV sets its fees over the next 10 years,

based on recovering its costs, which could possibly be higher than the CPI increments set by fee units.

6. Using a weighted decision criteria analysis, Options B and B1 (the proposed regulations) provide the highest weighted scores, with Options A, A1 and C1 having the lowest weighted scores. The proposed regulations have the greatest net benefits (in terms of non-fee regulations) and the lowest net cost (in terms of fees regulations); and are therefore the preferred option.
7. The proposed changes in the regulations would impose minimal administrative burdens on business and not for profit organisations, which is less than the $250,000 per annum threshold required by Government guidelines for the measurement of change in administrative burden.
8. The overall burden of the proposed regulations is likely to be similar to equivalent regulations in Queensland, less onerous than in NSW, but more onerous than in other states and territories. The main reason for this difference is that Victoria has the largest and most complex urban train and tram systems, and the mitigation of stray currents from these systems could be frustrated by interference from cathodic protection systems.
9. The costs imposed by the proposed regulations would constitute only a very small fraction of the annual turnover of each business. Therefore, they would not restrict competition by creating a barrier to the entry of new businesses and are unlikely to restrict competition.

In summary, the RIS concludes that that the proposed regulations:

- **are expected to impose costs on owners of cathodic protection systems;**
- **are expected to confer benefits in terms of minimising risks to public safety and the environment;**
- **are expected to confer net benefits compared to the base case;**
- **are not inequitable in terms of the distribution of costs and benefits; and**
- **do not restrict competition.**

Glossary of terms and acronyms

Act, the:	the **Electricity Safety Act 1998.**
anode:	the positive pole of a battery or other source of direct current.
competition:	the process of rivalry between independent firms or individuals in business. Competition occurs within a market.
common good:	a good that is non-excludable but rival. In other words, everybody has a right of access to common goods, but there is some competition for their use.
cathode:	the negative pole of a battery or other source of direct current (opposed to *anode*).
cathodic protection system:	means a prescribed system designed to use direct electric current to protect metallic structures from corrosion.
cost recovery:	the recuperation of the costs of government-provided or funded products or services that, at least in part, provide private benefits to individuals, entities or groups, or reflect the costs their actions impose.
ESV:	Energy Safe Victoria.
economic efficiency:	when an output of goods and services is produced making the most efficient use of scarce resources and when that output best meets the needs and wants of consumers and is priced at a price that fairly reflects the value of resources used up in production.
electrolysis:	the effect of stray electrical currents on buried metallic structures.
equity:	in general, the term 'equity' reflects concepts of fairness or justice. In a public finance context, 'horizontal equity' refers to treating people in similar situations in similar ways. 'Vertical equity' refers to those with greater means contributing proportionately more than those with lesser means.
enforcement officer:	means a person appointed as an enforcement officer under Part 11 of the Act.
existing regulations, the:	the *Electricity Safety (Stray Current Corrosion) Regulations 1999*
externality:	the cost or benefit related to a good or service that accrues to persons other than the buyer or the seller of that good or service.
fee:	a charge levied in order to recover some or all of the cost of providing a specific service.
fixed costs:	costs that do not vary with the volume of business.

galvanic anode:	means an electrode used to protect a structure by galvanic action.
impressed current:	direct current supplied by an external power source.
impressed current cathodic protection system:	comprises a ground bed and direct current power supply connected at a single point to a primary structure.
market:	an area of close competition between firms, or the field of rivalry in which firms operate.
market failure:	the situation which occurs when freely functioning markets, operating without government intervention, fail to deliver an efficient or optimal allocation of resources.
mitigation system:	means a prescribed system designed to reduce the effects on metallic structures of stray electrical currents.
monopoly:	a market structure such that only one firm supplies the entire market.
NCP:	National Competition Policy.
negative externality:	the situation that occurs when production and/or consumption impose external costs on third parties outside of the market for which no appropriate compensation is paid.
positive externality:	benefits relating to a good or service that fall on others besides buyers and sellers of that particular good or service. Also known as positive spill-overs and neighbourhood effects.
prescribed:	prescribed by an Act or subordinate legislation.
public good:	a good or service that is non-excludable and non-rival. Although a public good is not diminished by other users, it will not be produced in private markets because there is no way for the producer to keep those who do not pay for the good or service from using it.
restriction of competition:	something that prevents firms in a market or potential entrants to a market from undertaking the process of economic rivalry.
rival goods:	goods whose consumption by one consumer prevents simultaneous consumption by other consumers.
RIS:	Regulatory Impact Statement.
stakeholder:	an individual or group that has a vested interest in, or may be affected by, a project or process.
statutory rules:	regulations made by the Governor in Council and other instruments of a legislative character deemed by an Act or prescribed to be statutory rules.

stray current:	electrical current flowing through paths other than an intended circuit.
stray current corrosion:	corrosion damage resulting from current flow other than in the intended circuit(s).
tax:	an impost to raise government revenue.
TSC:	the Technical Sub-Committee of the VEC.
underground structures:	metallic objects buried underground, such as water or gas pipes, telecommunication or power cables, metal tanks, etc.
variable costs:	costs that vary with the volume of business.
VEC	Victorian Electrolysis Committee

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Appendices

1. ***List of organisations consulted***
2. ***Summary of material changes from existing regulations***
3. ***Fee calculations***
4. ***Basis of other quantified cost or benefit estimates***
5. ***Draft regulations***

Appendix 1 - List of organisations consulted

- South East Australia Gas Pty Ltd
- Santos Ltd
- Origin Energy Asset Management
- Origin Energy Resources (Bass Gas)
- International Power Mitsui
- GasNet Australia
- Gas Pipelines Victoria
- Alinta Network Services
- Envestra Limited
- SPI Networks (Gas) Pty Ltd
- Mt Hotham Alpine Resort Management Board
- Indigo Shire Council
- Elgas Limited Victoria
- APA Group

Appendix 2 – Summary of material changes[86] from existing regulations

Proposed Regulation	Subject	Existing Regulation	Reason for change
1	Objectives	1	Better reflects full scope of regulations.
2	Authorising provisions	2	No change.
3	Revocation	4	Existing regulations need to be revoked, if proposed regulations are to commence before the existing regulations expire.
4	Definitions	5	Some new definitions needed to include additional parts of AS2832 and to define the term 'registered cathodic protection system'.
5(1)	Prescribed systems – definition CPS	6(1)	Need to clarify 'system' as a connection to a single point, which aligns with current practice.
5(2)	Prescribed systems – mitigation systems	6(2)	No change.
6	Existing cathodic protection systems	7	Saves registration of existing CPSs >2A for 10 years or until withdrawn under regulations. For other CPSs until withdrawn under regulations. Higher current systems require review after 10 years.
7	Applications for registration of CPS	10, 12	• applications made by CPS owners only • consultation requirements (>250mA) less prescriptive.
8	Exemption from requirements	20	ESV can also exempt payment of fees, or the requirement to submit maps, drawings or a consultation report.
9	Further information may be required	13	No change.
10	Registration	14	Registration of existing CPSs >2A for 10 years or until withdrawn under regulations. For other CPSs until withdrawn under regulations. Higher current systems require review after 10 years.
11	Refusal of registration	15	No change (rewording only).
12	Register of certificates	16	Clarifies the meaning of 'particulars of each system'.
N/A	Mitigation systems	Part 3	Omitted from proposed regulations because the system of registration of mitigation systems was found to be unnecessary and therefore never implemented.
13	Details of change	28	Notification of change of ownership involves new certificate.

[86] That is, material changes in meaning, other than drafting changes.

14	Withdrawal of registration	29	Reference to section 95 removed (related to Part 3).
15	Renewal of registration	N/A	New regulation giving registered owners the right to apply for renewal of registration before expiry, even if the system is currently registered in the name of the operator.
16	Operation of cathodic protection systems	9	Need to include reference to additional parts of AS2832. Also to allow ESV to modify standards on application from registered owners of CPSs, where compliance with part of a standard is inappropriate.
17	Notice of operation	17	Change from operator to owner.
18(1)	Provision for testing CPS using impressed current	18(1)	No change.
18(2)	Provision for testing CPS using galvanised anodes	18(2)	No change.
19	Audit by the owner	19	Change from operator to owner.
20	Notification of modification or removal	30	Applies only to CPS, not mitigation systems. Change from 'a person' to owner of system.
21	Infringement notices	N/A	New regulation consequent on revocation of Reg 5(g) of *Electricity Safety (Infringements) Regulations 2000*. Also new infringement offence 13(1).
Schedule	Fees for cathodic protection systems	Schedule	Fees recalculated (refer to Part 4.0 of RIS)

Appendix 3 – Calculation of registration fees, fee collection costs and feasible alternatives for fees (Options A1, B1, and C1)

The purpose of Appendix 3 is twofold. Firstly, it establishes the cost of providing cathodic protection registration services by ESV. This is discussed in sections A3.1 to A3.5. Secondly, Appendix 3 illustrates three fee Options, A1, B1 and C1 in sections A3.6, A3.7 and A3.8, respectively. Section A3.6 (that is, Option A1) looks at a schedule of annual fees based on full recovery of costs in the respective year. Section A3.7 (that is, Option B1) looks at a schedule of annual fees based on full recovery of costs (excluding law enforcement costs) in the respective year. Section A3.8 (i.e. Option C1) introduces a maximum fee based on full cost recovery (excluding law enforcement costs) and set according to maximum annual costs in 2017/18.

A3.1 Discussion of tables A3.4 to A3.9

Table A3.4 establishes the cost of fee collection per application for registration or renewal of registration of cathodic protection systems. Table A3.5 establishes the hypothetical cost of law enforcement by ESV. Tables A3.6 to A3.8 illustrate the calculation of total cost of administering the applications of three particular current classes of cathodic protection systems:

- up to and including 250 milliamps (mA);
- over 250 milliamps (mA) and up to and including 2 amperes (Amps); and
- over 2 amperes (Amps).

The essential information required in Tables A3.4 to A3.8 includes the salary level, hourly charge out rate[87], the mean hours spent by the relevant staff on a particular activity and the number of applications. The estimate for the number of applications (both new and renewals) per class of protection system is derived in section A3.2. To calculate the charge out rates for particular salary levels, a mark-up factor is applied to annual salaries, as discussed in section A3.3.

A3.2 Estimate for the number of applications per annum per protection system class

A3.2.1 Estimate for the number of new applications per annum by protection system class

The number of new applications and registrations is a large driver of cost. The number of new applications for cathodic protection systems is assumed to be fairly constant[88] for the years 2008/09 to 2017/18. The estimate for the number of new applications per annum is derived by first establishing the number of new registration certificates issued per annum. The number of new certificates over 6 years in Table A3.1 has been provided on advice from ESV as no records regarding the number of certificates issued are available before 2001. As shown in Table A3.1, and apart from 2005/06 and 2006/07, there is no identifiable upward trend in the number of new certificates issued per annum. For example there is no increase of registrations after 2003 as the number of certificates issued in 2004/05 is in fact lower than in 2001/02. There happened to be marginally higher numbers in 2005//06 as compared with

[87] The hourly charge out rate represents the full recovery of all associated direct and indirect costs of registration processing by ESV.
[88] Based on advice from ESV.

2002/03 (4.2% more registrations). Moreover in 2006/07 there were a slightly higher than typical number of certificates issued. Therefore a 6 year mean is chosen as a reflection of the number of certificates to be issued in the next 10 year rather than relying on numbers in any particular year.

Table A3.1 - Number of new certificates issued per annum

Number of new certificates/annum							
2001/02		2002/03	2003/04	2004/05	2005/06	2006/07	Mean
Total[89]	347	376	335	343	392	415	**368**

The proportion of new applications by ESV for each of the three classes of protection systems over the last 2 years is provided by Table A3.2.

Table A3.2 - Breakdown of the number of new applications for the past two years (2006/07 - 2007/08)

Year	Up to and including 250mA	>250mA and < 2Amps	> 2 Amps
2006/07	272	44	22
2007/08	228	34	17
Mean annual number of applications	**250**	**39**	**19.5**
Proportion of total mean annual applications[90]	***81.04%***	***12.64%***	***6.32%***

Taking the proportion of total mean annual applications per current class (as shown in the last row of Table A3.2) and multiplying these proportions by the mean number of new certificates over 6 years taken from Table A3.1 – provides the following estimates for the number of new registrations per annum for each current class:

- Up to and including 250mA = 368 mean new certificates per annum x 81.04% = ***298 new registrations***[91]***/annum***
- Over 250mA and up to and including 2 Amps = 368 mean new certificates per annum x 12.64% = ***47 new registrations/annum***
- Over 2 Amps = 368 new certificates per annum x 6.32% = ***23 new registrations/annum***

A3.2.2 Estimate for the number of annual registration renewals for existing cathodic protection systems over 2Amps

There are currently 13,756[92] cathodic protection systems registered with ESV. Furthermore under proposed *regulation 15*, the registration of existing systems over 2Amps (that is, 5.59% of all systems[93]) would have to be renewed every 10 years. It is assumed that the occurrence of renewals would be approximately at a rate of 10% per annum over the next 10 years. Therefore the estimated number of annual renewals is calculated in the following way:

Total number of systems x proportion of systems > 2 Amps x rate of renewal/annum
=

[89] Totals in Table A.1 have been provided by ESV.
[90] Total mean annual applications is 308.5.
[91] All estimates have been rounded to the nearest whole dollar.
[92] Data provided by ESV.
[93] Proportion provided by ESV.

13,756 x 5.59% x 10% = ***87 registration renewals/annum***

A3.3 Calculation of markup factor and hourly charge out rates

The hourly charge out rates are calculated using a mark-up factor. Electrolysis group comprises 6.3% of all ESV staff; or 9.2 % of all ESV staff excluding indirect staff (e.g. I.T. payroll etc). It is important to note that the costs in Table A3.3 are only used as a reference to determine the on-cost and overhead cost multiplier. Such costs are not indicative of the amount of costs that need to be recovered from fees. That is to say, activities pertaining to cathodic protection relate to only a proportion of the total costs, shown in Table A3.3. The exact proportion of the costs of the electrolysis section pertaining to cathodic protection is unknown. It is for this reason a bottom up approach using a hours of work involved per activity per category of cathodic protection and a mark up representing on-costs and overhead costs, is utilised instead, The mark-up factor of 174.95% (as shown in Table A3.3) is derived as *total non-salary costs* expressed as a percentage of *total salary costs*:

$$\text{Mark up factor} = \frac{\text{total non - salary costs}}{\text{total salary costs}} \times 100$$

where *total non-salary costs* includes:

- Salary- related costs: long service/sick, annual leave, superannuation, WorkCover premiums etc; *plus*
- 'Other' non-salary costs including: 9.8% of ESV vehicle costs[94]; 3% of ESV IT costs[95]; and 2% of ESV accommodation costs[96].

Table A3.3 - Estimate of total costs for ESV electrolysis section and calculation of mark up factor 2008/09

Year	Total salary cost (a)	Salary related cost (b)	Other non-salary costs (c)			Mark up factor (d) = [(b)+(c)]/(a)*100
			Vehicle	IT	Accommodation	
2008/09	531,866	771,587	118,491	22,807	17,638	174.95%

This mark-up factor in Table A3.3 is used to calculate the hourly charge out rates. The hourly charge out rate for salary level X,[97] for example, which is $103.93, is calculated by first taking the annual salary, which is $X. This annual salary is then divided by 1,718 hours (approximately 215 working days per annum) and marked up by the relevant mark-up factor for that year.

$$\frac{\$X \times (1 + (\text{markup factor})/100)}{1{,}718\text{hrs}} = \$103.93$$

In turn, these hourly charge out rates are instrumental for determining the cost of particular activities involved in cathodic protection registration services for the particular current class. The cost of activities are used to establish the cost of

[94] 5 vehicles out of ESV total of 51.
[95] Less than staff pro-rata share due to low IT demand.
[96] Staff in location with lower rent than head office.
[97] Actual salary levels omitted for privacy reasons.

collecting fees (Table A3.4) and establish the appropriate registration fees for the three classes of protection systems (Tables A3.5 to A3.7) based on ***full cost recovery***.

According to Treasury cost recovery guidelines, costs to be considered for recovery, relevant for cathodic protection activities include specifically those:

- associated with the provision of services relating to cathodic protection registration; and
- incurred by government administering stray current regulation (*including law enforcement activities in relation to stray current corrosion).*

The relevant charge out rates are multiplied by the relevant number of hours spent by a staff member which gives the total cost of a particular staff class in a particular activity. The relevant staff classes are then added up to give the total cost of fee collection (in the case of Table A3.4), the cost of law enforcement (in the case of Table A3.5) or the total cost of registering a particular class of cathodic protection systems (in the case of Tables A3.7 to A3.9).

A3.4 Calculation of cost of fee collection for registration of all new cathodic protection systems plus renewals – 2008/09

Table A3.4 below, establishes the average cost of collecting fees per application. It is assumed that the average number of applications (new and renewals) per year will be constant over 10 years[98].

Table A3.4 - Calculation of total cost of fee collection per registration (new and renewals) – 2008/09

Related Activity (Fee collection for all applications new and renewed)	Hourly charge-out rate	Total time (hours)/ Annum (n)	Cost of activity (o) = (n)*(g)
Banking cheques	$139.93	26	$3,638.28
Invoicing/Reconciliation of registration fees	$89.39	62.4	$5,577.97
Total cost of fee collection			**$9,216.25**
Time take for all collections		**88.4hrs**	
Time taken per collection		**0.194hrs**	
Total number of registration applications per annum (new and renewals)			**455**
Total cost of fee collection per registration (new and renewals)			***$20.26***

A3.5 Calculation[99] of total law enforcement costs in relation to stray current corrosion for all three classes of cathodic protection systems 2008/09

Table A3.5 considers the 'hypothetical' cost of law enforcement activities with respect to stray current corrosion. Such activities involve both investigations, issuing of infringement notices and prosecutions. This cost calculation assumes that 3 infringement notices are issued and 1 prosecution is conducted per annum. To date there has been a lack of prosecution/enforcement history with respect to stray current corrosion – however consideration is made in relation to the 'potential' for such costs to be incurred by ESV in the future. Whilst investigation costs associated with prosecutions is included for recovery, legal costs of prosecutions are not as these are

[98] On advice from ESV.

[99] All calculations in this RIS have been undertaken via use of a spreadsheet and estimates may be subject to rounding error for ease of presentation.

recuperated from the defendant (i.e. the actual party responsible for the infringement). Legal costs to be recovered from the defendant include: receiving brief; drafting and settling charges; production and copying of a Magistrates Court "Brief of Evidence"; issuing and arranging for service; travel; and appearing in court.

Table A3.5 - Calculation of 'hypothetical' estimated total cost of law enforcement activities in relation to stray current corrosion– 2008/09

Related Activity (hypothetical law enforcement)	Hourly charge-out rate	Total time (hours)/ Annum (n1)	Cost of activity (o1) = (n1)*(g)
Investigation time (prosecution and non-prosecution related) including the following items: Receipt and initial evaluation of a complaint (1hr) On site investigation (2hrs) Travel to site (1hr) Take statement from a witness (1hr) Travel to obtain statement (1 hr) Prepare for interview (2 hrs) Conduct interview of 2 individuals (1hr) = 9hrs	$157.39	9hrs x 4	$5,666.04
Issuing an infringement notice	$157.39	0.5hrs x 3	$236.08
Prosecution related costs only (one prosecution per annum)			
Investigation time related to prosecution exclusively Preparing brief of evidence (3hrs) Discussion with prosecutor (1hr) Read and sign charge & summons (1hr) Court appearance (4 hrs) Travel to court (1hr) = 10hrs	$157.39	10hrs x 1	$1,573.90
Total cost of hypothetical law enforcement activities			**$7,476.02**
Time take for all hypothetical law enforcement		**47.5hrs**	
Time taken per application		**0.159hrs**	
Total number of registration applications per annum (new and renewals)			**455**
Total cost of hypothetical law enforcement to be recovered per registration (new and renewals)			***$16.43***

A3.6 Calculation[100] of registration fees for the three classes of cathodic protection systems 2008/09

Time estimates per activity (not including fee collection) vary according to the type of related activity associated with the relevant voltage system and whether or not there are scale economies associated with the process of registration. For example for systems over 2 Amps (as shown in Table A3.7) there are additional activities required for registration and fewer registrations (fewer scale economies (that is, only 100 activities) therefore more time required for each activity at an average of 3.68hrs. On the other hand for systems over 250mA and up to and including 2 Amps there are the same type of activities involved as with systems up to and including 250mA but there are fewer scale economies. For those >250mA and up to and including 2 Amps (see Table A3.7) there are only 47 activities and an average time per activity of 1.43hrs. However for systems up to and including 250mA there are 298 activities (see Table A3.6) and average time per activity of 0.48hrs due to greater scale economies. In

[100] All calculations in this RIS have been undertaken via use of a spreadsheet and estimates may be subject to rounding error for ease of presentation.

activities like *'Follow-ups, printing & mailing of the certificates after each meeting'* it takes 0.12hrs per activity in Table A3.5 where there are 298 applications whereas in Table A3.7 it takes 0.74hrs per activity where there are only 47 activities.

Table A3.6 - Calculation of registration fees for cathodic protection systems up to and including 250mA

Related Activity (For Applications up to and including 250mA)	Hourly charge-out rate	Total time (hours)/ Annum (h)	Cost of activity (i) = (h)*(g)
Entering CP applications for the previous month in the CP register.[101]	$169.26	70	$11,847.99
Printing and collating of the list of applications for presentation at meeting.	$169.26	9	$1,523.31
The administration activity within the meeting for CP applications involves both the manager and the network safety manager, Electrolysis.	$169.26	9	$1,523.31
Follow-ups, printing & mailing of the certificates after each meeting.	$169.26	35	$5,924.00
Request from organisation external to VEC to review the CP database to verify the existence or not of CP systems at a particular site.	$139.93	20	$2,798.68
Total cost of registration not including cost of fee collection			**$23,617.29**
Total time taken for all registrations (not including collection)		**143hrs**	
Total time taken per registration (not including collection)		**0.48hrs**	
Total number of expected registration applications per annum			**298**
Total cost of fee collection per application[102]			***$20.26***
Total cost of law enforcement recovered from each application[103]			***$16.43***
Total fee per registration (up to and including 250mA)[104]			***$115.94***

Table A3.7 - Calculation of registration fees for cathodic protection systems over 250mA and up to and including 2 Amps

Related Activity (For Applications over 250mA and up to and including 2 Amps)	Hourly charge-out rate	Total time (hours)/ Annum (j)	Cost of activity (k) = (j)*(g)
Entering CP applications for the previous month in the CP register.	$169.26	9	$1,523.31
Printing and collating of the list of applications for presentation at meeting.	$169.26	1	$169.26

[101] One officer conducts all activities in relation to each application. The small size of the work unit does not allow specialisation of activities.
[102] This figure is taken from Table A3.4.
[103] This figure is taken from Table A3.5.
[104] These figures are obtained by taking the total cost of registration (not including collection) divided by the total number of expected applications and then adding the total cost of fee collection per application.

Related Activity (For Applications over 250mA and up to and including 2 Amps)	Hourly charge-out rate	Total time (hours)/ Annum (j)	Cost of activity (k) = (j)*(g)
The administration activity within the meeting for CP applications involves both the manager and the network safety manager, Electrolysis.	$169.26	2	$338.51
Follow-ups, printing & mailing of the certificates after each meeting.	$169.26	35	$5,924.00
Request from organisation external to VEC to review the CP database to verify the existence or not of CP systems at a particular site.	$139.93	20	$2,798.68
Total cost of registration not including cost of fee collection			**$10,753.76**
Total time taken for all registrations (not including collection)		**67hrs**	
Total time take per registration (not including collection)		**1.43hrs**	
Total number of expected registration applications per annum			**47**
Total cost of fee collection per application[105]			***$20.26***
Total cost of law enforcement recovered from each application[106]			***$16.43***
Total fee per registration (>250mA and up to 2Amps)[107]			***$265.49***

Table A3.8 - Calculation of registration fees for cathodic protection systems over 2 Amps

Related Activity (For Applications over 2 Amps)	Hourly charge-out rate	Total time (hours)/ Annum[108] (l)	Cost of activity (m) = (l)*(g)
Entering CP applications for the previous month in the CP register.	$169.26	30.1	$5,092.90
Printing and collating of the list of applications for presentation at meeting.	$169.26	30.1	$5,092.90
The administration activity within the meeting for CP applications involves both the manager and the network safety manager, Electrolysis.	$169.26	30.1	$5,092.90
Follow-ups, printing & mailing of the certificates after each meeting.	$169.26	117.0	$19,805.73
The database is researched to determine CP systems over 2 Amps that will be within or adjacent to the Area Test.	$103.72	20.1	$2,084.77
Field work associated with testing the Area Test (i.e. organising the switching, evaluating the results etc).	$103.72	73.6	$7,644.14
Request from organisation external to	$139.93	66.9	$9,356.84

[105] This figure is taken from Table A3.4.
[106] This figure is taken from Table A3.5.
[107] These figures are obtained by taking the total cost of registration (not including collection) divided by the total number of expected applications and then adding the total cost of fee collection per application.
[108] These figures have been rounded to one decimal place.

Related Activity (For Applications over 2 Amps)	Hourly charge-out rate	Total time (hours)/ Annum[108] (l)	Cost of activity (m) = (l)*(g)
VEC to review the CP database to verify the existence or not of CP systems at a particular site.			
Total cost of registration not including cost of fee collection			**$54,170.17**
Total time taken for all registrations (not including collection)		**367.8hrs**	
Total time taken per registration (not including collection)		**3.68hrs**	
Total estimated number of expected registration applications per annum			**23**
Total estimated number of registration renewals per annum			**77**
Total cost of fee collection per application[109]			***$20.26***
Total cost of law enforcement recovered from each application[110]			***$16.43***
Total fee per registration (over 2Amps)[111]			***$578.95***

In summary, the total cost of activities for ESV involving cathodic protection registration and renewal applications for 2008/09 equals ***$105,188.50***, including the cost of fee collection and law enforcement – (see Table A3.9).

Table A3.9 -Total cost of application and renewals for ESV for all protection systems – 2008/09

Activity	Number of registration applications + renewals	Per registration application or renewal cost	Total cost
Processing applications for cathodic protection systems up to and including 250mA	298[112]	$115.94	$34,549.81
Processing applications for cathodic protection systems > 250mA and up to 2Amps	48[113]	$265.49	$12,743.50
Processing applications for cathodic protection systems > 2Amps	100[114]	$578.95	$57,895.18
Total cost of application and renewals for all protection systems			***$105,188.50***

A3.7 Fee Option A1 (setting of registration/renewal fees based on full cost recovery)

[109] This figure is taken from Table A3.4.
[110] This figure is taken from Table A3.5.
[111] These figures are obtained by taking the total cost of registration (not including collection) divided by the total number of expected applications and then adding the total cost of fee collection per application.
[112] This figure is obtained from Table A3.6.
[113] This figure is obtained from Table A3.7.
[114] This figure is obtained from Table A3.8 and represents both estimated new registrations (23) + estimated renewals (77).

Option A1 involves setting fees based on full estimated costs including the costs of law enforcement. Based on tables A3.7 to A3.9 in section A3.6 of Appendix 3, the following schedule of fees in Table A3.10 is provided:

Table A3.10 - Registration/renewal fees under Option A1 - 2008-09

Year	Fee Category		
	Up to and including 250mA	**> 250mA and up to 2Amps**	**> 2Amps**
2008/09	**$115.94**	**$265.49**	**$578.95**

As shown in Table A3.11, the total fee cost of Option A1 in 2008/09 present value dollars over 10 years is estimated to be approximately up to ***$1.01m***. The total fee cost remains unknown with certainty as proposed *regulation 8*, enables ESV to exempt applications for systems under 250mA and over 250mA from fees. However the extent of exemption, and therefore cost savings in terms of fees over the next 10 years, would remain unknown.

Table A3.11 - Calculation of incremental fee cost of cathodic protection system registration activities by ESV 2008-09 to 2017/18 in present value 2008/09 dollars – Option A1

Activity	10 year cost[115]	10-year discounted[116] fee cost in present value 2008/2009 dollars
Processing applications for cathodic protection systems up to and including 250mA	$396,074.89	$338,083.25
Processing applications for cathodic protection systems > 250mA and up to 2Amps	$143,046.44	$122,102.18
Processing applications for cathodic protection systems > 2Amps	$644,196.85	$551,517.59
Total fee cost	***Up to $1,183,318.18***	***Up to $1,011,703.02***

A3.8 Fee Option B1 (setting of registration/renewal fees based on full cost recovery less law enforcement costs)

Option B1 involves setting fees based on full estimated costs less the costs of law enforcement. Based on tables A3.7 to A3.9 in section A3.6 of Appendix 3, the following schedule of fees in Table A3.10 is provided:

Table A3.10 - Registration/renewal fees under Option B1 - 2008-09

Year	Fee Category		
	Up to and including 250mA	**> 250mA and up to 2Amps**	**> 2Amps**
2008/09	**$99.51**	**$249.06**	**$562.52**

As shown in Table A3.11, the total fee cost of Option B1 in 2008/09 present value dollars over 10 years is estimated to be approximately up to ***$0.95m***. Again the total fee cost remains unknown with certainty as proposed *regulation 8*, enables ESV to exempt applications for systems under 250mA and over 250mA from fees. However

[115] The figures in this column are obtained by taking the 2008/09 costs in Table A3.9 and then incrementing the cost over 10 years by 3% per annum for each cathodic protection system.
[116] A discount factor of 3.5% is used for present value calculations.

the extent of exemption, and therefore cost savings in terms of fees over the next 10 years, would remain unknown.

Table A3.11 - Calculation of incremental fee cost of cathodic protection system registration activities by ESV 2008-09 to 2017/18 in present value 2008/09 dollars – Option B1

Activity	10 year cost[117]	10-year discounted[118] fee cost in present value 2008/2009 dollars
Processing applications for cathodic protection systems up to and including 250mA	$339,943.32	$290,170.23
Processing applications for cathodic protection systems > 250mA and up to 2Amps	$134,193.48	$114,545.43
Processing applications for cathodic protection systems > 2Amps	$644,196.85	$549,876.22
Total fee cost	***Up to $1,118,333.65***	***Up to $954,591.88***

A3.8 Fee Option C1 (setting a maximum registration/renewal fee)

Setting a maximum fee based on the maximum possible annual cost for ESV (that is, the cost in 2017/18) would provide maximum flexibility for ESV to cope with its costs over the 10 year period. Based on an increment of costs of 3%[119] over 10 years the maximum per unit cost of activities for new applications and renewals in 2017/18 including the cost of fee collection is summarised in Table A3.12.

As shown in Table A3.13, the total fee cost of Option C1 in 2008/09 present value dollars over 10 years is estimated to be up to between ***$0.95m*** and ***$1.09m***. Again the total fee cost remains unknown with certainty as proposed *regulation 8*, enables ESV to exempt applications for systems under 250mA and over 250mA from fees. However the extent of exemption, and therefore cost savings in terms of fees over the next 10 years, would remain unknown.

Option C1 represents the possibility that ESV could set the fees anywhere between those represented in Table A3.10 or the maximum fees in Table A3.12. If ESV were to set the fees equal to those in Table A3.10 and then increment them by 3% per annum until the maximum fees are reached in Table A3.12 then the cost in present value dollars would be $0.95m. On the other hand there is a possibility that ESV could set the fees equal to the maximum fees in Table A3.12 and maintain them for 10 years – for which the cost in present value dollars would be $1.09m.

While removing certainty with regards to increment of fees based on expected changes in inflation, Option C1 would provide flexibility for ESV in meeting unforeseen changes in costs over the next 10 years. However, if the rate of CPI increase is greater on average than 3% per annum - then a maximum fee could

[117] The figures in this column are obtained by taking the 2008/09 costs in Table A3.9, subtracting the cost of law enforcement (i.e. $16.43 x the relevant number of registrations (new and renewals) and then incrementing the net cost over 10 years by 3% per annum for each cathodic protection system. Please note that all calculations have been undertaken using a spreadsheet and figures presented may be subject to rounding error for ease of presentation.

[118] A discount factor of 3.5% is used for present value calculations.

[119] This is assumed to be the average expected rate of inflation over the next 10 years.

jeopardise the ability for ESV to recover its costs in relation to applications for new registrations and registration renewals for cathodic protection.

Table A3.12 - Schedule of maximum fees under Option C1 based on full recovery of costs in 2017/18

Activity	Total cost 2017/18	No. of new applications/ + renewals	Max fee Category
Processing applications for cathodic protection systems up to and including 250mA	$38,691.00	298[120]	**$129.84**
Processing applications for cathodic protection systems > 250mA and up to 2Amps	$15,273.37	48[121]	**$318.20**
Processing applications for cathodic protection systems > 2Amps	$73,319.93	100[122]	**$733.20**

Table A3.13 - Calculation of incremental fee cost of cathodic protection system registration activities by ESV 2008-09 to 2017/18 in present value 2008/09 dollars – Option C1

Activity	10 year cost	10-year discounted[123] fee cost in present value 2008/2009 dollars
Processing applications for cathodic protection systems up to and including 250mA	Between $339,943.32[124] and $386,909.98[125]	Between $290,170.23 and $333,039.98
Processing applications for cathodic protection systems > 250mA and up to 2Amps	Between $134,193.48 and $152,733.68	Between $114,545.43 and $131,468.37
Processing applications for cathodic protection systems > 2Amps	Between $644,196.85 and $733,199.25	Between $549,876.22 and $631,114.93
Total fee cost	***Up to between $1,118,333.65 and $1,272,842.92***	***Up to between $954,591.88 and $1,095,623.28***

[120] This figure is obtained from Table A3.6.
[121] This figure is obtained from Table A3.7.
[122] This figure is obtained from Table A3.8 and represents both estimated new registrations (23) + estimated renewals (77).
[123] A discount factor of 3.5% is used for present value calculations.
[124] This figure is obtained from Table A3.11.
[125] The figure is obtained by taking the value from Table A3.12 and multiplying it by 10 years.

Appendix 4 – Discussion of 'other' quantifiable and unquantifiable costs and benefits

The purpose of Appendix 4 is to identify 'other' (that is, non-fee) costs and benefits of the proposed regulations. All incremental costs and benefits are compared to the 'base case' and both quantifiable and unquantifiable components are discussed.

A4.1 Unquantifiable incremental benefit (cost savings) of exemption of cathodic protection systems designed to protect internal surfaces arising under proposed *regulation 5(1)*

Where the impact of cathodic protection is contained within a structure, cathodic protection does not affect other parties or structures. Therefore, the objective of the overall proposed regulations (particularly in addressing negative externalities) does not apply to this group of systems. Metallic structures that have internal cathodic protection include but are not limited to the following examples:

- Metallic tanks (ranging from domestic water tanks to large multi mega litre storage tanks);
- Internal surfaces of pipelines (including the Latrobe Valley waste water fallout and the cooling water pipelines for Newport Power station);
- Domestic hot water services (both gas and electric);
- Ship hulls and metallic building structures.

According to ESV, the number of these types of structures is enormous with well over one million hot water units alone in operation within Victoria. Without proposed *regulation 5(1)*, the Victorian community would be subject to an enormous incremental cost where systems designed to protect internal surfaces would have otherwise fallen under the remaining regulations as registration is required by the Act. In particular the costs incurred would have encompassed registration costs (including fees); providing additional information; change of details; notice of operation; provisions for testing; audits + provision of reports; and notification of modification and removal. Such costs, while unquantifiable, would have been millions of dollars per annum.

A4.2 Quantifiable administrative time cost estimate of applications for cathodic protection system registration and renewals under proposed *regulations 7, 10 and 15*

Proposed *regulation 7* applies to all registrations indicating information required as well as the fee required. Proposed *regulation 10* sets a limit of registration of 10 years for systems over 2 Amps and an indefinite registration period for other systems unless withdrawn. For systems over 2Amps over 10 years, proposed *regulation 15* allows for renewal of registration and sets the information and fee requirements the same as proposed *regulation 7*.[126]

The non-fee administrative cost of proposed *regulation 7*, in conjunction with *10* and *15* is calculated in the following way. The average hourly wage rate is used as a de facto measurement in order to cost the time expended by an applicant in relation to the requirements of registration/renewal of a cathodic protection system. The average

[126] The combined incremental fee cost of proposed regulations 7, 10 and 15 is given as $X (See Table A3.8 for source of figure).

wage is deemed to be appropriate when estimating the time cost of administration where the level or position of the person undertaking the task is unknown. The average hourly wage rate for any given year (assuming a 41hr work week, an on-cost multiplier of 1.165 and an overhead cost multiplier of 1.5[127]) is taken from the estimates for full-time average weekly total adult earnings in Victoria which is *$1,090.80* per week in 2007/08[128] (see Table A4.1). Furthermore, the estimates for full-time average weekly total adult earnings in Victoria have been incremented by 4.33% per annum which was the average annual increase in weekly earnings between 1995/96 to 2005/06[129].

Table A4.1 - Projected full-time average weekly total adult earnings in Victoria and average hourly cost of time

Year	Estimated full-time average weekly total adult earnings in Victoria (n)	Average hrly cost of time (o) = (n)/41hrs*1.165*1.5
2008/09	$1,138.03	$48.51
2009/10	$1,187.31	$50.61
2010/11	$1,238.72	$52.80
2011/12	$1,292.36	$55.08
2012/13	$1,348.31	$57.47
2013/14	$1,406.70	$59.96
2014/15	$1,467.61	$62.55
2015/14	$1,531.15	$65.26
2016/17	$1,597.45	$68.09
2017/18	$1,666.62	$71.03

It is noted that a registration form would typically involve hardcopy documentation with submission through the mail. It is assumed that filling out a hardcopy document entails an average of 30 minutes of a person's time[130]. In addition, under *proposed regulation 7 and 15*, for cathodic protection systems over 250mA, where a consultation report is required, it is assumed that an average of three stakeholders would need to be consulted and that each consultation would involve an average of 30 minutes of time. Therefore applications for systems over 250mA would involve an additional 1.5 hrs of consultation on average. Therefore total time spent by applicants involving systems less than and greater than 250mA would be 0.5hrs and 2hrs, respectively.

The non-fee administrative costs of applying for a registration or renewal are given as ***$222,695.61*** in 2008/09 dollars and are summarised in Table A4.2.

[127] State Government of Victoria, 2007.
[128] ABS, March 2008, *State and Regional Indicators, Victoria*, Cat. No. 1367.2.
[129] ABS, May 2006, *Average Weekly Earnings, Australia, (Table 1. Average Weekly Earnings, Australia (Dollars) – Trend)*, Cat. No. 6302.0.
[130] On advice from ESV.

Table A4.2 - Incremental administrative cost of applications (new registration and renewals of registration) 2008/09 to 2017/18

Year	Average hrly cost of time (o)	Number of applications affected[131] (p)	Time expended on application by applicant (hrs) (q)	Non-fee cost of applications (r) = (o)*(p)*(q)
		< 250mA	0.5	
		> 250mA	2.0	
2008/09	$48.51	298	0.5	$7,227.26
		147	2	$14,250.42
2009/10	$50.61	298	0.5	$7,540.20
		147	2	$14,867.47
2010/11	$52.80	298	0.5	$7,866.70
		147	2	$15,511.23
2011/12	$55.08	298	0.5	$8,207.32
		147	2	$16,182.86
2012/13	$57.47	298	0.5	$8,562.70
		147	2	$16,883.58
2013/14	$59.96	298	0.5	$8,933.47
		147	2	$17,614.64
2014/15	$62.55	298	0.5	$9,320.28
		147	2	$18,377.35
2015/16	$65.26	298	0.5	$9,723.85
		147	2	$19,173.09
2016/17	$68.09	298	0.5	$10,144.90
		147	2	$20,003.29
2017/18	$71.03	298	0.5	$10,584.17
		147	2	$20,869.43
Total 10 year non-fee cost of applications				**$261,844.23**
Total 10 year present value of non-fee cost of applications				***$222,695.61***

A4.3 Unquantifiable incremental benefit (administrative cost savings) of exemption registration requirements under proposed *regulation 8*

Proposed *regulation 8*, enables ESV to exempt applications for systems under 250mA from being required to submit maps, drawings and fees, and exempts application for systems over 250mA from being required to submit maps, drawings, consultation reports and fees. However, the extent of exemption is unknown and not predictable for the next 10 years. To the extent that there are approximately 298 applications per annum for systems under 250mA and 147 applications per annum for systems over 250mA, the potential benefit (however unlikely) is anywhere *up to* up to ***$222,695.61***[132] in terms of administrative costs in 2008/09 dollars.

[131] See section A3.2 of Appendix 3 for numbers of new registrations under and over 250mA
[132] See Table A4.2 of Appendix 4

A4.4 Quantifiable administrative cost estimate of providing further information for cathodic protection system registration under proposed *regulation 9*

Proposed regulation 9 requires additional information for new registration of protection systems and only applies to impressed current systems with an output greater than 2 Amps (see Table A4.3).

Table A4.3 Breakup up of class and type of cathodic protection system

Current class	Type of cathodic protection system	
	% using Galvanic anodes	% using Impressed current
< 250mA	81.3%	0.05%
Between 250mA and up to 2Amps	11.6%	1.46%
> 2 Amps	0.34%	5.25%

There are 23 expected registration applications per annum over 2Amps and 93.92% of those would have an impressed current system. However, on advice from ESV only 5% of these would require additional information to be provided under proposed *regulation 9*. Therefore the relevant number of applications affected under proposed *regulation 9* would be:

23 new annual applications > 2Amps x 93.92% (i.e. those >2Amps with impressed current) x 5% =

1.08 or approximately 1 applicant per annum

The total incremental cost of proposed *regulation 9* is estimated assuming that the provision of additional information is 180 minutes on average per year at most. As shown in Table A4.4, the estimated incremental cost of proposed *regulation 9* over 10 years in present value terms (2008/09 dollars) would only be approximately ***$1,508.84***.

Table A4.4 - Administrative incremental cost of providing additional information for new registrations under proposed *regulation 9* - 2008/09 to 2017/18

Year	Average hrly cost of time (o)	Non-fee cost of providing additional information (s) = (o)*(1 applicant)*(3hrs)
2008/09	$48.51	$145.53
2009/10	$50.61	$151.83
2010/11	$52.80	$158.40
2011/12	$55.08	$165.24
2012/13	$57.47	$172.41
2013/14	$59.96	$179.88
2014/15	$62.55	$187.65
2015/16	$65.26	$195.78
2016/17	$68.09	$204.27
2017/18	$71.03	$213.09
Total 10 year non-fee cost of additional information for new registrations		**$1,774.08**
Total 10 year present value of non-fee cost of additional information for new registrations		***$1,508.84***

A4.5 Unquantifiable incremental cost to applicants of testing and modification of cathodic protection system when requested by ESV under proposed *regulation 11*

ESV can refuse registration under proposed *regulation 11*, until testing or modification is conducted where ESV requests such actions be taken. This is likely to be the case where systems have the potential to affect the electric potential of other metallic structures (in terms of its earth). Since the incidence of when this would be required and the physical dollar cost of modification is not known and highly variable – the incremental costs of proposed *regulation 11* remain unquantifiable.

A4.6 Quantifiable administrative cost estimate of providing details of change for cathodic protection system registration under proposed *regulation 13*

Proposed *regulation 13* involves the requirement of providing details of a change of name or address or of ownership. However the cost is assumed to be negligible as it is assumed to occur no more than 5 times a year[133] and would only involve several minutes either by fax or email correspondence. Assuming that it would take only 5 minutes and that 5 changes would occur per annum, the estimate for the 10 year present value of incremental costs under proposed *regulation 13* would only be ***$209.56*** in 2008/09 dollars, as summarised in Table A4.7.

Table A4.5 - Administrative incremental cost of providing details of change under proposed *regulation 13* for registered cathodic protection system - 2008/09 to 2017/18

Year	Average hrly cost of time (o)	Non-fee cost of providing details of change (t) = (o)*(5 changes)*(1/12hr)
2008/09	$48.51	$20.21
2009/10	$50.61	$21.09
2010/11	$52.80	$22.00
2011/12	$55.08	$22.95
2012/13	$57.47	$23.95
2013/14	$59.96	$24.98
2014/15	$62.55	$26.06
2015/16	$65.26	$27.19
2016/17	$68.09	$28.37
2017/18	$71.03	$29.60
Total 10 year non-fee cost of providing details of change		**$246.40**
Total 10 year present value cost of providing details of change		***$209.56***

The incremental negligible annual cost of issuing a new certificate of registration for *change of ownership* would typically only occur once or twice a year. Furthermore, this cost would be calculated as the product of the charge out rate of the relevant ESV employee; the time taken to issue a new certificate (7.5 minutes[134]); and the occurrence of a change in details of ownership (assumed to no more than six times a

[133] Based on advice from ESV.
[134] Based on advice from ESV.

year[135]). The 10 year present value incremental cost to ESV of issuing new certificates would be only ***$903.38*** in 2008/09 dollars and is summarised in Table A4.6.

Table A4.6 - Incremental cost to ESV of issuing a new certificate of registration under proposed *regulation 13* - 2008/09 to 2017/18

Year	Hourly charge out rate of ESV employee (g)[136]	Cost of issuing a new certificate (u) = (g)*(6 certificates)*(1/12hr)
2008/09	$139.93	$104.95
2009/10	$139.93	$104.95
2010/11	$139.93	$104.95
2011/12	$139.93	$104.95
2012/13	$139.93	$104.95
2013/14	$139.93	$104.95
2014/15	$139.93	$104.95
2015/16	$139.93	$104.95
2016/17	$139.93	$104.95
2017/18	$139.93	$104.95
Total 10 year cost of issuing a new certificate of registration		**$1,049.50**
Total 10 year present value cost of issuing a new certificate of registration		***$903.38***

A4.7 Unquantifiable cost of unsuccessful application for modification of system which does not meet Standards 1, 2, 3 or 5 under proposed *regulation 16*

Proposed *regulation 16* requires that all systems failing to meet Standards 1,2,3 or 5 would need to be modified. It is noted on advice from ESV that very few unsuccessful applications requiring modification of a system would occur per annum. However, this cost remains unquantifiable as the extent of modifications (physical and in dollar terms) which would need to occur in order to satisfy the relevant standard under the proposed regulation remains unknown.

A4.8 Quantifiable administrative cost estimate of providing notice of operation for use of impressed current under proposed *regulations 17*

Under proposed *regulation 17*, owners of new or modified impressed current cathodic protection systems must give notice in writing to ESV via mail or email before operation commences. The incidence of modification for existing impressed current systems is 0.5% per annum. Furthermore proposed *regulation 17* also encompasses all new annual registrations of impressed current systems. Based on the proportions using impressed current in Table A4.5, the number of *existing systems* which would be affected by the cost of providing notice is calculated as:

> Total number of systems (13,756) x the proportion which are impressed (6.76%) x the incidence of modification of existing systems 5% = **5**

[135] Based on advice from ESV.
[136] See Table A3.4 for source of figures.

Of the *new systems* being registered per annum, the incidence of the use of impressed current is given as follows:

< 250mA = 0.05%
Between 250mA and up to 2Amps = 1.46%
>2Amps = 5.25%

Therefore, the number of new systems using impressed current would be 0.05% of 298 new systems up to 250mA; 1.46% of 47 new systems >250mA and up to 2Amps; and 5.25% of 23 new systems >2Amps = **2**

Finally, on advice from ESV it is understood that notification of operation would entail only minutes (assumed to 5 minutes for the purposes of cost estimation). Subsequently, the estimate for the 10 year present value of incremental costs under proposed *regulation 17* would only be ***$293.39*** in 2008/09 dollars, as summarised in Table A4.7.

Table A4.7 - Administrative incremental cost of providing notice of operation for use of impressed current under proposed *regulation 17* - 2008/09 to 2017/18

Year	Average hrly cost of time (o)	Non-fee cost of providing notice of operation (v) = (o)*(7 incidences of modification existing and new)*(1/12hr)
2008/09	$48.51	$28.30
2009/10	$50.61	$29.52
2010/11	$52.80	$30.80
2011/12	$55.08	$32.13
2012/13	$57.47	$33.52
2013/14	$59.96	$34.98
2014/15	$62.55	$36.49
2015/16	$65.26	$38.07
2016/17	$68.09	$39.72
2017/18	$71.03	$41.43
Total 10 year cost of providing notice of operation		**$344.96**
Total 10 year present value of cost of providing notice of operation		***$293.39***

A4.9 Quantifiable cost estimate of testing cathodic protection systems using impressed current and galvanised nodes under proposed *regulations 18(1) and 18(2)*, respectively

A4.11.1 Cost of installing time switch sockets for systems using impressed current (proposed regulation 18(1))

There are 13,756 total systems registered[137] with 6.67% using impressed current (see Table A4.6). This would leave 930 systems using impressed current, however assuming that only 10% of these systems do not comply with proposed *regulation 18(1)* - then this would leave about 93 systems affected. It is understood that the cost of a time switch socket is approximately $15[138] and would be installed during manufacture. Therefore the total one-off cost over 10 years, would be approximately 93 systems x $15 = ***$1,394.86*** in 2008/09 dollars.

[137] Based on data provided by ESV
[138] Based on advice from ESV

A4.11.2 Cost of installing copper cable and test box for systems using galvanic anodes (proposed regulation 18(2))

The one-off 10 year cost of this proposed regulation will include the installation of a short length of copper cable and test box which would cost approximately $100[139] and would only relate to systems using galvanic anodes. The remainder of the 13,756 total systems registered (that s, 93.33%) use galvanic anodes (see Table A4.5) (that is, approximately 12,838 systems). ESV has noted that by installing a test box and cable, this not only allows the circuit to be broken for testing purposes, but it is also good industry practice as it allows the anode to be disconnected from the main once the magnesium/zinc has become spent. Therefore, it is assumed that only 1% of such galvanic systems do not comply with proposed *regulation 18(2)* and that this would leave approximately 1,284 registered systems affected. Subsequently, the total one-off cost over 10 years, would be approximately 128 systems x $100 = ***$12,838.47*** in 2008/09 dollars.

A4.10 Quantifiable cost estimate of annual audit of a system >250mA by the owner and making records available for ESV under proposed *regulation 19*

Proposed *regulation 19* requires an annual audit of protection systems over 250mA, and that records of the audit be made available to ESV. The relevant number of cathodic protection systems which would be affected by proposed *regulation 19* would be all systems which are greater than 250mA and *do not pertain to gas* (audit for systems involving gas are already required under other regulations for gas) and which do not already comply with proposed *regulation 19.* The annual inspection of a cathodic protection system is considered to be good industry practice and is already followed by the majority of structure owners. It is noted by ESV that it would be pointless applying cathodic protection to a structure and then not carrying out monitoring on a regular basis to ensure that the system is operating as per the design criteria. Therefore, for this reason it is assumed that only 10% of systems would fail to be inspected on an annual basis.

Using advice from ESV, there are approximately 9,200 cathodic protection systems which do not pertain to gas. Of these 18.65% would have a current greater than 250mA leaving 1,716 systems - and if 10% of these fail to comply, the number of systems actually affected by proposed *regulation 19* is approximately *172.* It is assumed that it would take approximately one hour to inspect and measure operating currents for each system. Furthermore, the cost of making records available for ESV would not entail an additional time/administrative cost for those 172 systems failing to comply. It is assumed that this would require 30 minutes of time.

Subsequently, the estimate for the 10 year present value of incremental costs under proposed *regulation 19* would be ***$129,760.30*** in 2008/09 dollars, as summarised in Table A4.8.

[139] Based on advice from ESV.

Table A4.8 - Administrative incremental annual cost of audit for systems >250mA under proposed *regulation 19* - 2008/09 to 2017/18

Year	Average hrly cost of time (o)	Administrative cost of testing current and making records (w) = (o)*(172 annual audits)*(1.5hrs)
2008/09	$48.51	$12,515.58
2009/10	$50.61	$13,057.38
2010/11	$52.80	$13,622.40
2011/12	$55.08	$14,210.64
2012/13	$57.47	$14,827.26
2013/14	$59.96	$15,469.68
2014/15	$62.55	$16,137.90
2015/16	$65.26	$16,837.08
2016/17	$68.09	$17,567.22
2017/18	$71.03	$18,325.74
Total 10 year non-fee cost of testing current and making records		**$152,570.88**
Total 10 year present value of testing current and making records		***$129,760.30***

A4.11 Quantifiable cost estimate of notification of modification or removal of a cathodic protection system under proposed *regulation 20*

Proposed *regulation 20* entails the owner of a cathodic protection system proposing changes involving system modification or removal to notify ESV by fax or email correspondence, which is assumed to involve only 5 minutes of time. Furthermore, it is understood that there are on average about 5 incidences of modification per annum and about 1.5 incidences of removal on average per annum (that is, 6.5 incidences of modification or removal on average per annum). Subsequently, the estimate for the 10 year present value of incremental costs under proposed *regulation 20* would be ***$272.43*** in 2008/09 dollars, as summarised in Table A4.9.

Table A4.9 - Administrative incremental annual cost of notification of modification or removal under proposed *regulation 20* - 2008/09 to 2017/18

Year	Average hrly cost of time (o)	Administrative cost of notification of modification or removal (x) = (o)*(incidence of modification or removal 6.5)*(1/12hr)
2008/09	$48.51	$26.28
2009/10	$50.61	$27.41
2010/11	$52.80	$28.60
2011/12	$55.08	$29.84
2012/13	$57.47	$31.13
2013/14	$59.96	$32.48
2014/15	$62.55	$33.88
2015/16	$65.26	$35.35
2016/17	$68.09	$36.88
2017/18	$71.03	$38.47
Total 10 year cost of notification of modification or removal		**$320.32**
Total 10 year present value cost of notification of modification or removal		***$272.43***

A4.12 Summary of quantifiable costs for the proposed regulations (excluding fee costs) over 10 years

Finally, Table A4.10, summarises all the quantifiable/incremental costs of the proposed regulations (excluding fee costs) over 10 years. The incremental 10-year net cost of the proposed options in 2008/9 dollars is estimated to be approximately 0.369***m***.

Table A4.10 – Summary of 10 year quantifiable non-fee costs of the proposed regulations in 2008/09 dollars

Proposed regulation	Cost item description	Cost imposed on	10-year cost	10-year PV cost
Reg.7, 10 & 15	Applying for cathodic protection system registration and renewals (time cost only)	Owners of cathodic protection systems	+$261,844.23	+$222,695.61
Reg.9	Providing additional information for new registrations for impressed current systems with an output greater than 2 Amps	Owners of new impressed current cathodic protection systems >2 Amps	+$1,774.08	+$1,508.84
Reg.13	Providing details of a change of name or address or of ownership	Owners of cathodic protection systems	+$246.40	+$209.56
Reg.17	Providing notice of operation for systems using impressed current	Owners of cathodic protection systems (using impressed current)	+$344.96	+$293.39
Reg.18(1)	Installation of time switch sockets for systems using impressed current	Owners of cathodic protection systems (10% of those who use impressed current and do not comply)	+$1,394.86[140]	+$1,394.86
Reg.18(2)	Installation of a short length of copper cable and test box – for systems using galvanic anodes	Owners of cathodic protection systems (1% of those who use galvanic anodes and who do not comply)	+$12,838.47[141]	+$12,838.47
Reg.19	Testing current and making records for a system >250mA	Owners of cathodic protection systems >250mA	+$152,570.88	+$129,760.30
Reg.20	Notification of modification or removal	Owners of cathodic protection systems	+$320.32	+$272.43
Net total 10-year cost			***$431,334.20***	***$368,973.46***

[140] One-off cost in 2008/09.
[141] One-off cost in 2008/09.

Appendix 5 – Draft regulations

Electricity Safety (Cathodic Protection) Regulations

Exposure Draft

TABLE OF PROPOSALS

Victoria

Electricity Safety (Cathodic Protection) Regulations

Exposure Draft

PART 1—PRELIMINARY

1 Objectives

The objectives of these Regulations are—

(a) to prescribe cathodic protection systems and mitigation systems for the purposes of the **Electricity Safety Act 1998**; and

(b) to prescribe standards for the operation of cathodic protection systems; and

(c) to provide procedures for the registration of cathodic protection systems; and

(d) to protect metallic structures from damage associated with stray current corrosion and interference from cathodic protection associated with other metallic structures in the vicinity; and

(e) to prescribe certain provisions of these Regulations that create offences as provisions in respect of which infringement notices may be served; and

(f) to make a related consequential amendment to the Electricity Safety (Infringements) Regulations 2000.

2 Authorising provisions

These Regulations are made under sections 155 and 157 of the **Electricity Safety Act 1998**.

3 Revocation

The Electricity Safety (Stray Current Corrosion) Regulations 2009[1] are **revoked**.

4 Definitions

In these Regulations—

Cathodic Protection Standard 1 means AS 2832.1, Australian Standard 'Cathodic protection of metals—Pipes and cables' as published or amended from time to time;

Cathodic Protection Standard 2 means AS 2832.2, Australian Standard 'Cathodic protection of metals—Compact buried structures' as published or amended from time to time;

Cathodic Protection Standard 3 means AS 2832.3, Australian Standard 'Cathodic protection of metals—Fixed immersed structures' as published or amended from time to time;

Cathodic Protection Standard 5 means AS 2832.5, Australian Standard 'Cathodic protection of metals—Steel in concrete structures' as published or amended from time to time;

electrolysis drainage bond means the path by which stray traction current from an underground or underwater metallic structure is returned to its originating source;

galvanic anode means an electrode used to protect a structure by galvanic action;

impressed current means direct current supplied by an external power source;

registered cathodic protection system means a cathodic protection system registered under Part 2;

stray current means current flowing through paths other than an intended circuit;

stray traction current means current flowing through the ground or water as a result of the operation of any railway by a path other than the intended circuit;

the Act means the **Electricity Safety Act 1998**.

5 Prescribed systems

(1) For the purposes of the definition of ***cathodic protection system*** in section 3 of the Act, a prescribed system is a system that—

(a) uses one or more galvanic anodes connected at a single point to a structure to provide intentional cathodic protection; or

(b) uses impressed current connected at a single point to a structure to provide intentional cathodic protection—

but does not include a system that is designed to protect the internal surfaces of a structure.

(2) For the purposes of the definition of ***mitigation system*** in section 3 of the Act, a system that uses electrolysis drainage bonds and associated apparatus, cable and drainage equipment is a prescribed system.

6 Existing cathodic protection systems

If a cathodic protection system was registered under the Electricity (Stray Current Corrosion) Regulations 2009 and that registration was in force immediately before the commencement of these Regulations, the cathodic protection system is to be taken to be registered under these Regulations—

(a) in the case of a cathodic protection system with an output greater than 2 amperes—

(i) until the date that is 10 years after the date the cathodic protection system was registered under the Electricity Safety (Stray Current Corrosion) Regulations 2009; or

(ii) until the registration is withdrawn under these Regulations—

whichever occurs first; or

(b) in the case of any other cathodic protection system, until registration is withdrawn under these Regulations.

PART 2—REGISTRATION OF CATHODIC PROTECTION SYSTEMS

7 Application for registration of cathodic protection system

(1) The owner of a cathodic protection system who intends to operate that system, or intends to allow that system to be operated, must apply to Energy Safe Victoria to have the system registered.

(2) An application for registration of a cathodic protection system with a total output of 250 milliamperes or less must—

(a) be in writing; and

(b) include the name and address of the owner of the cathodic protection system; and

(c) include the name of the operator or proposed operator of the cathodic protection system if the operator is not or will not be the owner; and

(d) indicate the proposed operating current of the cathodic protection system; and

(e) be accompanied by—

(i) a map showing the proposed location of the cathodic protection system, the metallic structure it is intended to protect and all metallic structures likely to be affected by the system; and

(ii) drawings detailing the cathodic protection system; and

(iii) the relevant registration fee set out in the Schedule.

(3) An application for registration of a cathodic protection system with a total output of more than 250 milliamperes must—

(a) be in writing; and

(b) include the name and address of the owner of the cathodic protection system; and

(c) include the name of the operator or proposed operator of the cathodic protection system if the operator is not or will not be the owner; and

(d) indicate the proposed operating current of the cathodic protection system; and

(e) be accompanied by—

(i) a map showing the proposed location of the cathodic protection system, the metallic structure it is intended to protect and all metallic structures likely to be affected by the proposed system; and

(ii) drawings detailing the proposed system; and

(iii) a report on all consultations carried out between the applicant and the owners of metallic structures (***metallic structure owners***) likely to be affected by the cathodic protection system including—

(A) the names, addresses and telephone numbers of the metallic structure owners consulted; and

(B) the dates each of the metallic structure owners were consulted; and

(C) any known objections to the registration of the system; and

(iv) the relevant registration fee set out in the Schedule.

8 Exemption from requirements

Energy Safe Victoria may exempt an applicant for registration of a cathodic protection system from the requirements in regulations 7(2)(e) or 7(3)(e).

9 Further information for purposes of consideration of application

Energy Safe Victoria may require the applicant for registration under regulation 7 to provide any other information relating to the application that it considers necessary to determine whether to register the cathodic protection system.

10 Registration

(1) If Energy Safe Victoria is satisfied with a cathodic protection system, Energy Safe Victoria may register the system and grant a certificate of registration for the system to the owner of the system.

(2) Registration of a cathodic protection system ceases—

(a) in the case of a cathodic protection system with an output greater than 2 amperes—

(i) 10 years after the date on which registration is granted; or

(ii) when withdrawn under these Regulations—

whichever occurs first;

(b) in the case of any other cathodic protection system, if withdrawn under these Regulations.

11 Refusal of registration

(1) Energy Safe Victoria may refuse to register a cathodic protection system—

(a) until any testing required by Energy Safe Victoria has been completed to the satisfaction of Energy Safe Victoria; or

(b) if it reasonably believes that any metallic structure, other than the one to which the system is or will be connected, may have its electrical potential with respect to earth changed due to the operation of the system.

(2) If subregulation (1)(b) applies, Energy Safe Victoria may require the cathodic protection system to be modified, to its satisfaction, before it registers the system.

12 Register of certificates

(1) Energy Safe Victoria must keep a register of cathodic protection systems registered under these Regulations.

(2) A register kept under subregulation (1) must contain—

(a) the names and addresses of the owners of registered cathodic protection systems; and

(b) particulars of each cathodic protection system, including—

(i) the location of the system; and

(ii) the type of system (being either a system that uses galvanic anodes or impressed current);

(iii) the approved maximum operating current of the system; and

(iv) the terms of every modification contained in a determination made under regulation 16(4).

13 Details of change

(1) The owner of a registered cathodic protection system must give Energy Safe Victoria details of a change of name or address or of ownership within 20 business days of the change occurring.

Penalty: 10 penalty units.

(2) If Energy Safe Victoria is notified under subregulation (1) of a change in ownership of the cathodic protection system, Energy Safe Victoria may grant a new certificate of registration to the new owner of that system.

14 Withdrawal of registration

(1) Energy Safe Victoria may withdraw the registration of a cathodic protection system if a person to whom a notice is given under section 96 of the Act fails to comply with the directions in that notice.

(2) Energy Safe Victoria must give written notice of its intention to withdraw registration to the owner of the cathodic protection system 10 business days before it withdraws the registration.

15 Renewal of registration

(1) The owner of a registered cathodic protection system may apply to Energy Safe Victoria to renew the registration of the system.

(2) The application may be made at any time before the registration of the registered cathodic protection system expires or is withdrawn under these Regulations.

(3) Regulations 7(2) to 11 apply to an application under this regulation as if a reference to cathodic protection system were a reference to the registered cathodic protection system in respect of which the application has been made.

PART 3—OPERATION OF CATHODIC PROTECTION SYSTEMS

16 Operation of cathodic protection systems

(1) For the purpose of section 93(2) of the Act—

(a) a cathodic protection system for the protection of a buried or submerged metallic pipe or cable must be operated in accordance with—

(i) Cathodic Protection Standard 1; or

(ii) if Energy Safe Victoria determines, under this regulation, that Cathodic Protection Standard 1 should apply as modified by Energy Safe Victoria, the applicable Standard as modified;

(b) a cathodic protection system for the protection of the external surfaces of a compact buried structure must be operated in accordance with—

(i) Cathodic Protection Standard 2; or

(ii) if Energy Safe Victoria determines, under this regulation, that Cathodic Protection Standard 2 should apply as modified by Energy Safe Victoria, the applicable Standard as modified;

(c) a cathodic protection system for the protection of the external surfaces of a fixed immersed structure must be operated in accordance with—

(i) Cathodic Protection Standard 3; or

(ii) if Energy Safe Victoria determines, under this regulation, that Cathodic Protection Standard 3 should apply as

modified by Energy Safe Victoria, the applicable Standard as modified;

(d) a cathodic protection system for the protection of steel in concrete that is exposed to air or buried or submerged must be operated in accordance with—

(i) Cathodic Protection Standard 5; or

(ii) if Energy Safe Victoria determines, under this regulation, that Cathodic Protection Standard 5 should apply as modified by Energy Safe Victoria, the applicable Standard as modified.

(2) A person who owns a cathodic protection system to which a standard specified in subregulation (1) applies may, in writing, apply to Energy Safe Victoria for the relevant standard to apply to that system in a modified way.

(3) An application under subregulation (2) must set out the terms of the modification sought.

(4) On receiving an application under subregulation (2), Energy Safe Victoria may determine that a relevant standard specified in subregulation (1) applies to the system as modified by the determination.

(5) A determination under this regulation must—

(a) set out the terms of the modification; and

(b) be given to the applicant.

(6) The terms of a modification must be entered onto the register kept under regulation 12.

17 Notice of operation

The owner of a registered cathodic protection system that uses impressed current must give Energy Safe Victoria at least 5 business days notice of intention to commence operation of the system.

18 Provision for testing

(1) The owner of a registered cathodic protection system that uses impressed current must ensure that a time switch is able to be inserted in the system to enable the power supply to be interrupted for test purposes.

Penalty: 20 penalty units.

(2) The owner of a registered cathodic protection system that uses galvanic anodes must ensure that the circuit between any anode of the system and the metallic structures to be protected is able to be readily disconnected for test purposes.

Penalty: 20 penalty units.

19 Audit by the owner

(1) The owner of a registered cathodic protection system with a total output of more than 250 milliamperes must annually inspect and record the operating current of the system.

(2) The owner of a registered cathodic protection system must ensure that a record prepared under subregulation (1) is available for inspection at all reasonable times by—

(a) Energy Safe Victoria; and

(b) persons whose metallic structures are affected or likely to be affected by that cathodic protection system.

20 Notification of modification or removal of cathodic protection system

(1) The owner of a registered cathodic protection system with a total output of more than 250 milliamperes who—

(a) changes the operation of that system; or

(b) becomes aware of a change in the operation of that system—

must notify Energy Safe Victoria within 4 business days and give written notice within 10 business days, after that change or becoming aware of that change.

Penalty: 20 penalty units.

(2) The owner of a registered cathodic protection system with a total output of more than 250 milliamperes who—

(a) removes that system; or

(b) becomes aware of the removal of that system—

must notify Energy Safe Victoria within 4 business days and give written notice within 10 business days, after that change or becoming aware of that change.

Penalty: 20 penalty units.

PART 4—INFRINGEMENT OFFENCES

21 Provisions for which infringement notices may be served

(1) For the purposes of paragraph (b) of the definition of ***prescribed offence*** in section 140A of the Act, regulations 13(1), 18(1), 18(2), 20(1) and 20(2) are prescribed provisions.

(2) Regulation 5(g) of the Electricity Safety (Infringements) Regulations 2000[2] is **revoked**.

SCHEDULE

Regulation 7(2)(e)(iii) and 7(3)(e)(iv)

FEES FOR CATHODIC PROTECTION SYSTEMS

Item	*Description*	*Registration fee*
1	Registration fee for a cathodic protection system with a total output up to and including 250 milliamperes	8·77 fee units
2	Registration fee for a cathodic protection system with a total output over 250 milliamperes and up to and including 2 amperes	21·95 fee units
3	Registration fee for a cathodic protection system with a total output over 2 amperes	49·57 fee units

ENDNOTES

[1] Reg. 3: S.R. No. 32/2009.

[2] Reg. 21(2): S.R. No. 136/2000 as amended by S.R. Nos 114/2004, 32/2009, 36/2009 and 37/2009.

Table of Applied, Adopted or Incorporated Matter Required by the Subordinate Legislation Regulations 2004

Note that the following table of applied, adopted or incorporated matter is included in accordance with the requirements of regulation 5 of the Subordinate Legislation Regulations 2004.

Statutory Rule Provision	Title of applied, adopted or incorporated document	Matter in applied, adopted or incorporated document
Regulation 16(1)(a)	Australian Standard 2832.1 'Cathodic protection of metals—Pipes and cables', as published or amended from time to time	All
Regulation 16(1)(b)	Australian Standard 2832.2 'Cathodic protection of metals—Compact buried structures', as published or amended from time to time	All
Regulation 16(1)(c)	Australian Standard 2832.3 'Cathodic protection of metals—Fixed immersed structures', as published or amended from time to time	All
Regulation 16(1)(d)	Australian Standard 2832.5 'Cathodic protection of metals—Steel in concrete structures', as published or amended from time to time	All