

Queensland



Regulatory Impact Statement for SL 2002 No. 260

Electrical Safety Act 2002

ELECTRICAL SAFETY REGULATION 2002

1. TITLE

Electrical Safety Regulation 2002

2. INTRODUCTION

The Government is reforming the administration of electrical safety in Queensland. This process aims to reduce the overlap and confusion between the *Electricity Act 1994* and the *Workplace Health and Safety Act 1995* through the introduction of stand-alone electrical safety legislation. The *Electrical Safety Bill 2002* will regulate electrical safety in homes, workplaces and public places in a manner consistent with the *Workplace Health and Safety Act 1995*. As part of this process it is proposed to make an *Electrical Safety Regulation*.

The *Electrical Safety Bill 2002* is proposed to impose obligations on a range of persons including manufacturers, importers, suppliers, owners, persons in control of a place, employers, self employed persons and workers. This RIS outlines options for proposed regulations dealing with the electrical hazards in workplaces and homes. The proposed provisions will provide direction and clarity as to the duty imposed on these obligation holders.

In order to provide a single comprehensive regulation for electrical safety, the safety aspects of the *Electricity Regulation 1994* will be combined with the *Electricity (Electrical Articles) Regulation 1994* and Part 16 of the *Workplace Health and Safety Regulation 1997*. The RIS does not address all aspects of the proposed regulation. The options will focus

on the proposed amendments to the current regulatory framework that may impose an appreciable cost on the community or part of the community. This RIS will not consider:

- existing regulations to be incorporated into the proposed regulation without substantial amendment;
- proposed amendments that do not increase the burden on industry or the community; or
- proposed amendments that are substantially uniform with the legislation of another State.

3. BACKGROUND

3.1 Current Situation

Electrical safety in Queensland is currently administered by two legislative regimes:

- the *Electricity Act 1994* which regulates electricity generators, transmitters and distributors and promotes electrical safety through regulating electrical work and electrical safety standards; and
- the *Workplace Health and Safety Act 1995* that seeks to prevent or minimise exposure to the risks associated with hazards in the workplace, including electrical hazards.

3.2 Electrical Safety Reform

The Parliamentary Commissioner for Administrative Actions (Queensland Ombudsman) has handed down the first three in an expected series of reports into 13 electrical fatalities in Queensland.¹ The Ombudsman recommended a comprehensive strategic and management review be conducted of the Electrical Safety Office be conducted.

¹ *The Sokol Report* (Parliamentary Commissioner of Investigations), *The Kirmos Report* (April 2001, Parliamentary Commissioner of Investigations) and *The Martin Report* (Parliamentary Commissioner of Investigations March 2002).

In addition to the review of the Electrical Safety Office, in February 2001 the then Minister for Employment, Training and Industrial Relations, the Honourable Paul Braddy MP and the then Minister for Mines and Energy, the Honourable Tony McGrady MP established a joint Ministerial Taskforce to investigate and make recommendations on the manner in which electrical incidents can be prevented and investigated.

These reviews recommended the development of stand-alone electrical safety legislation to cater for the specific requirements of the electricity industry. The recommendations of the *Joint Ministerial Electrical Safety Taskforce Report* (April 2001) and the *Ministerial Review on the Electrical Safety Office* (June 2001) further recommended:

- that stand-alone electrical safety legislation be based on the *Workplace Health and Safety Act 1995* and be complementary to other safety legislation;
- an independent electrical safety regulator should be established. The position should have the status of a Statutory Officer, reporting to the Minister for Industrial Relations;
- the existing Electrical Health and Safety Council be replaced by an Electrical Safety Board to make recommendations for improved safety performance to the Minister of Industrial Relations;
- the introduction of safety management plans for network operators;
- the introduction of enforceable undertakings; and
- the proposed legislation apply to Queensland Rail (QR) other than to the requirements of height for the installation of overhead conductors associated with the rail traction system and signalling.

3.3 Electrical Safety Legislation in Queensland

Following the recommendations of the Queensland Ombudsman's reports, the *Joint Ministerial Electrical Safety Taskforce Report* (February 2001) and the *Ministerial Review into the Electrical Safety Office* (July 2001), in August 2001, the Minister for Industrial Relations, the Honourable Gordon Nuttall MP, requested the Department of Industrial Relations develop proposals for stand-alone electrical safety legislation.

The introduction of the *Bill* will involve an amendment to separate the *Electricity Act 1994* into two Acts. The non-safety aspects of electricity regulation will remain in the *Electricity Act 1994* and the safety aspects will be incorporated into the *Electrical Safety Bill 2002*.

The *Bill* will have as its objective the prevention of death and injury to persons and damage to property by electricity. It will achieve this objective by establishing a framework that reflects modern enforcement principles and includes clearer provisions and penalties that are consistent with the *Workplace Health and Safety Act 1995*. This will include:

- imposing obligations on persons who may affect the electrical safety of others by their acts or omissions;
- establishing benchmarks for industry and the public through:
 - making regulations, codes of practice and ministerial notices on safety and technical requirements for electrical matters; and
 - introducing safety management systems for prescribed electricity entities; and
- providing for consumer protection for electrical work and the safety of all persons through licensing and discipline of electrical workers and contractors.

3.4 The Electrical Safety Regulation

This RIS considers the introduction of a package of electrical safety reforms that will improve Queensland's electrical safety performance by targeting the management of high- risk electrical hazards and identified deficiencies in the existing regulatory framework. The package has been formulated from the recommendations of the Taskforce and Electrical Safety Office reviews and submissions on the issues paper "*Safer Workplaces, Safer Homes – Legislating Electrical Safety in Queensland*", which was released for public comment in November 2001.

The *Safer Workplaces, Safer Homes* issues paper formed the basis for consultation with key industry stakeholders on the proposed legislative changes and focused on those issues that were not addressed in detail in either of the two reviews.

The RIS deals with seven policy issues proposing new regulatory provisions either recommended by the reviews or submissions to the issues paper. These are:

1. work conducted near live exposed electrical parts;
2. requirements for live electrical work;
3. electrical contractor licensing;

4. safety management systems for network operators;
5. accredited auditors;
6. incident notification; and
7. requirements for second-hand electrical equipment suppliers.

4. PROPOSED NEW REGULATORY PROVISIONS

4.1 Work Near Exposed Live Parts

In the last 10 years there have been 42 fatalities linked to contact with exposed live parts of electrical equipment, electrical installations or power lines.

The *Electricity Act 1994* does not specify requirements other than for electrical work, for working safely around live electrical parts, which is considered to be a significant deficiency in the legislation. Work around live parts can involve clearing debris around a transformer, painting around the electrical connection point to a home, work around neighbourhood power lines or persons other than electrical workers working on or near electrical installations and equipment. Incidents associated with contact with powerlines and live electrical parts are a significant factor in Queensland's poor electrical safety performance.

To address these concerns it is proposed that the *Electrical Safety Regulation* will introduce nationally consistent safe approach distances for workers other than electrical workers, working near exposed live electrical parts and powerlines. The safe approach distances are contained in the Electricity Supply Association of Australia's "*National Guidelines for Safe Approach Distances to Electrical Apparatus*".

4.2 Requirements For Live Electrical Work

In the last 10 years 9 electrical fatalities involved electrical workers working on live electrical circuits. There have also been many serious injuries such as flash burns resulting from accidents while working live.

A culture exists in the industry that electrical work must be performed live to minimise inconvenience to consumers and business. While live work is accepted industry practice, recent audits of electrical contractors found that only 13% of the contractors audited had a documented "live work

policy”, and that there were widespread cases of inadequate testing equipment and personal protective equipment.

To address this unacceptable risk, it is proposed to restrict the circumstances in which electrical workers can work live. The proposed requirements will provide some flexibility for electrical workers as they recognise that in some situations it is not practicable to isolate supply such as testing and fault finding work on installations and equipment. There are also situations such as repairs of traffic signals where isolating supply would cause other significant risks to the public. In these situations the requirement will be to identify and manage safety issues through a documented “safe system of work” to ensure safety while the work is being carried out.

The requirements under the proposed regulation will require electrical workers to do certain things to ensure safety while they are carrying out the work if electricity cannot be isolated. The proposed requirements will include a documented assessment of the risks and the necessary personal protective equipment.

4.3 Electrical Contractor Licensing

Electrical contractor licensing in Queensland was introduced to set minimum standards for those electrical workers who wanted to establish businesses providing electrical services to the public. The licensing requirements focus on consumer protection, business management and technical competence.

Electrical contractor licensing provides consumer protection where non-complying or sub standard work may be unsafe for occupants or result in additional costs to the consumer such as costs associated with rectification work or a resultant house fire. Consumer protection is justified for electrical work as in most instances the public is “uninformed” in relation to evaluating the quality and safety of the electrical work undertaken.

The *Electricity Regulation 1994* requires that a licensed electrical contractor must carry out the installation of electrical wiring or fixed connected electrical equipment such as ceiling fans in a home. There is no similar business licensing requirement for persons undertaking other forms of electrical work such as whitegoods or other appliance repairs in the home or workplace.

To ensure consumer protection for all types of electrical work it is proposed to extend the contractor licensing requirements to all electrical work for the public. This will not include electrical work conducted under a business licence issued by the Building Services Authority or for the manufacturing of electrical equipment.

4.4 Safety Management Systems For Network Operators

It is becoming increasingly difficult for governments to introduce legislative frameworks that specify the outcomes to be achieved in situations where the hazards and risks vary widely according to the workplace. This is particularly so in large complex organisations such as electricity distribution networks. The Electrical Safety Taskforce in its *Review of Industry Compliance with Electrical Safety Standards and the Investigation of Serious Electrical Incidents* recommended the introduction of safety management systems for electricity network operators.

A safety management system provides for an integrated approach by employers, their contractors and workers to address the hazards and risks associated with their equipment, installations and methods of work.

The proposed provisions will require electricity distributors and transmitters to prepare safety management systems based on hazards and risks identified in consultation with workers and the employer's contractors. The proposed provisions will specify the content of the safety management system. The system will be independently audited to ensure all major hazards and risks are identified and addressed. Appropriately qualified persons will be accredited by the Department of Industrial Relations to undertake this role.

This approach will provide community benefits through a coordinated approach to all electrical safety aspects of an electricity entity's network, including maintenance.

4.5 Accredited Auditors – Safety Management Systems, High Voltage and Hazardous Locations

Currently an authorised person, prior to connection to supply must inspect electrical work on a high voltage installation or within a hazardous area where there is a risk of explosion. This requirement is additional to the installer's obligation to certify that the work has been tested to ensure electrical safety and compliance with appropriate standards. Authorised persons employed by electricity distributors carry out this function.

Due to the diversity in classes of electrical installation work involving high-voltage and hazardous situations, it is difficult for authorised persons to maintain the necessary skills to undertake this activity particularly in areas where the workload is infrequent. Issues associated with the availability of appropriately experienced authorised persons in non-metropolitan areas have also been raised as a concern.

It is proposed to introduce a requirement that electrical work on high voltage installations or within a hazardous area be inspected by an accredited auditor prior to connection to supply. An accredited auditor will be a person with the necessary skills and experience to determine if the work complies with the appropriate standard. An accredited auditor can be an employee or contractor to the company undertaking the work. However, there will be a requirement that the accredited auditor who checks the work cannot be the same person who carried out the work. The Department of Industrial Relations will accredit the auditors. The Department will develop criteria and a registration framework for accredited auditors for these activities. This proposal will ensure that the costs associated with ensuring electrical safety in these high-risk areas rests with the person or organisation that benefits from the activity.

The proposed provisions will also require prescribed operators of electrical networks in public areas to develop a safety management system. A safety management system will address all aspects of electrical safety associated with a distributor's and transmitter's assets and work electrical safety obligations in an integrated manner. It is proposed the safety management system be independently assessed and validated by an appropriately qualified person accredited with the Department of Industrial Relations. The electricity distributors and transmitters have agreed that this is an appropriate way to address their safety obligations.

The Department will develop criteria and a registration framework for accredited auditors for these activities. This proposal will ensure that the costs associated with ensuring electrical safety in these high-risk areas rests with the person or organisation that benefits from the activity.

4.6 Incident Notification

The *Electricity Act 1994* requires occupiers, electrical contractors, special approval holders and electrical contractors to report all incidents where a person receives a shock or other personal injury from electricity.

Electricity distributors such as Energex or Ergon Energy are usually the first point of contact in the case of electrical incidents. Where an electric

shock occurs at a workplace, an employer is required to notify both the Division of Workplace Health and Safety in the Department and the electricity distributor about the incident.

There have been concerns raised by employers that the dual reporting requirements for electrical incidents are excessive and the electricity distributors have raised concerns in relation to the onerous nature of the reporting requirements.

It is proposed to introduce new incident reporting criteria that will require an employer or self-employed person to report all serious electrical incidents immediately after they become aware of the incident to the chief executive of the Department of Industrial Relations.

Electricity distributors will be required to report serious electrical incidents and dangerous electrical events reported to them, to the chief executive. A serious electrical incident will be used to describe an electrical incident that results in death or an electric shock or injury resulting from electricity where a person receives medical treatment from a medical professional. It will also include high voltage electrical shocks whether or not medical treatment is required or obtained.

A dangerous electrical event will be used to describe an event that may endanger the electrical safety of persons, regardless of whether people are in the vicinity or not when the event occurred. This refers to such things as alleged unlicensed or unsafe electrical work or equipment and incorrect polarity/incorrect connections to supply identified by distributors.

Once notified of a serious electrical incident, the electricity distributor, employer or self-employed person must notify the chief executive:

- immediately where there is a fatality; or
- within 24 hours, where there is not a fatality.

In the case of a dangerous electrical event the electricity distributor must notify the chief executive within four days.

Note: These reporting requirements are separate from and do not alter requirements for reporting a death under the *Coroners Act 1958*.

The proposed requirements for incident notification are consistent with the approach adopted by all Australian States. Therefore, as the proposed legislation only provides for a matter arising under legislation that is substantially uniform with legislation of another State, an assessment of costs and benefits has not been included.

4.7 Requirements for Second-hand Electrical Equipment Suppliers.

It is proposed to amend the present requirements for labelling second-hand electrical equipment so that a supplier of second-hand electrical equipment will only have to provide information for its safe use.

The proposed requirement for information on safe use reflects current obligations of suppliers in the *Workplace Health and Safety Act 1995* and the information on electrical safety status replaces existing requirements to apply labels that indicate whether or not equipment has been tested to confirm it is electrically safe.

It is proposed that information will be developed and available on the Departmental Website for downloading to assist suppliers to meet this requirement. Therefore this requirement is not expected to place an appreciable additional cost on the community.

The net community cost of the amendments to the current requirements is considered to be less than the present system costs. The community will benefit from this requirement through increased electrical safety awareness leading to improved electrical safety performance.

5. AUTHORISING LAW

An objective of the Queensland *Electricity Act 1994* is “to promote electricity safety”. This is given effect by the *Electricity Regulation 1994*, which aims to ensure the electricity safety of electrical workers, other workers, customers and the general public (section 3(a)).

Chapter 13 –Regulations of the *Electricity Act 1994* provides the head of power for the making of a regulation. A regulation may be made about matters mentioned in Schedule 2. Specifically, this part gives a head of power for the Governor in Council to make a regulation under the *Electricity Act 1994* for matters including:

- safety in relation to electricity and its use, including safety of private plant (s 264);
- safety of electrical equipment and installations, including the safety of private plant (s 264);
- licences, certificates and permits for electrical contractors (ss 264, 268);

- the safety of electrical articles, including selling, hiring, stamping, marking and labelling (s 267); and
- accident investigation procedures and reports (s 264).

While the authorising law will be the *Electricity Act 1994*, subject to Parliament's consideration of the *Electrical Safety Bill 2002* the proposed regulations will form part of the proposed regulations to be made under the *Bill*. The power for the Governor-in-Council to make a regulation will be included in the *Electrical Safety Bill 2002*.

6. POLICY OBJECTIVES

The number of deaths and injuries caused by electricity is unacceptable. Queensland has the second highest electrocution rate of any Australian State, recording:

- over the past 5 years 3.57 fatalities per million people, compared with the Australian average of 2.19; and
- in the year 2000/2001 10 electrical fatalities and 1234 non-fatal electrical accidents (including 34 hospitalisations).

The seriousness of this problem has been recognised in a number of independent reviews and investigations conducted into electrical safety in Queensland and the Electrical Safety Office.² These reviews clearly highlighted the need for electrical safety reform that will prevent and minimise the risks to persons from electricity through the introduction of stand-alone legislation and revising the framework that electrical safety is administered and enforced.

The primary objective of the options outlined in this RIS is to prevent death and injury to all persons from electricity by providing:

- effective mechanisms to manage the risks associated with working on or near "live" electrical circuits;
- greater levels of consumer protection through appropriate licensing requirements for electrical contractors;
- for the introduction of safety management systems to provide for integrated electrical safety management by electricity distributors;

² The Independent Review of the Electrical Safety Office, (June 2001) and the Electrical Safety Taskforce Report (April 2001).

- effective incident notifications and reporting procedures;
- ensuring a workable balance between clarity and flexibility for obligation holders in meeting the safety outcomes required by the *Bill*; and
- clear nationally consistent standards to be met with respect to the solutions chosen.

Through meeting these objectives a reduction in the number of deaths and injuries will be achieved, and a community standard for electrical safety maintained.

7. POLICY OPTIONS

This RIS considers the introduction of a package of electrical safety reforms that will target high-risk electrical hazards and the identified deficiencies in the existing regulatory framework. It outlines three options for preventing the death and injury to persons by electricity and improving the regulatory framework in which electrical safety is enforced. These options are:

- **Option 1** – no additional regulatory intervention;
- **Option 2** – introduce a package of reforms based on a combination of performance and prescriptive based regulation, that:
 1. extends the type of work which must be performed by a licensed electrical contractor;
 2. restricts the circumstances in which “live” work can be undertaken;
 3. regulates working near exposed “live” electrical parts;
 4. amends the requirements for second-hand suppliers of electrical equipment;
 5. introduces safety management systems for prescribed electricity distributors;
 6. clarifies incident notification and reporting requirements; and
 7. provides for the appointment of accredited auditors; or

- **Option 3** – introduce a package of performance based reforms that:
 1. allows obligation holders flexibility in determining how to discharge their obligations under the Bill;
 2. revises incident notification and reporting; and
 3. establishes the position of accredited auditors.

The advantages and disadvantages of each option with respect to meeting the policy objective of the proposed regulation are examined in this RIS. The preferred option in the RIS is Option 2, as it will meet the policy objectives by:

- addressing the deficiencies highlighted in the existing regulation while providing industry with a workable and effective combination of flexibility and prescription;
- providing an effective mechanism for managing the risks to persons associated with working on and around exposed live electrical parts;
- providing greater levels of consumer protection through expanding the type of work that must be performed by a licensed electrical contractor;
- providing greater flexibility for key obligation holders in the electricity supply industry in managing the complex risks associated with their electrical hazards and increased incentives for the development of higher benchmarks within that industry;
- incorporating nationally consistent electrical safety standards and requirements; and
- providing additional tools to improve compliance and reduce death and injury by electricity.

7.1 Option 1 – No additional regulatory intervention (not preferred)

The option of “do nothing” is to maintain the current situation under which there are no additional regulations specifically addressing the areas outlined in this RIS. However, guidance material would be prepared to alert persons to the desired standards. For example, electrical workers and contractors may continue to work live without a formal assessment of risk and there would continue to be a requirement on employers to report shocks under the *Electricity Act 1994* and the *Workplace Health and Safety Act 1995*.

Enforcement strategies and education/awareness campaigns would continue to be the primary tools used to encourage compliance.

The main advantage of Option 1 is that persons will have discretion in whether the information outlined in guidance material will be followed or another way of managing the risk will be adopted.

Identified gaps in the legislative framework and adequate consumer protection are the key drivers influencing the introduction of the proposed provisions. As a result, these issues will not be adequately addressed through guidance material. For example, in the past 10 years, 9 electrical workers have died while working on or near live circuits and many more have been injured. There is unlikely to be any significant reduction in this fatality rate without mandatory requirements for live work and working around live parts.

Queensland's electrical safety record of 62 fatalities in the past 5 years is unacceptable. During 2000/2001 there were 10 recorded electrical fatalities, and 1234 non-fatal electrical accidents including 34 hospitalisations. In view of this safety record and the limited ability of the current legislation to influence improvement with respect to these matters, this option is not considered appropriate. There is broad stakeholder support for changing the present legislation to include the proposed performance and prescriptive mix in regulatory requirements. This option is not consistent with the recommendations of the Electrical Safety Taskforce and Independent Review of the Electrical Safety Office.

Option 1 is not considered an appropriate option to achieve the policy objectives.

7.2 Option 2 - A combination of performance based and prescriptive regulations (Preferred).

Under this option a combination of performance and prescriptive based regulations that prescribe outcomes would be introduced. The policy direction results from the recommendations of the Electrical Safety Taskforce and Independent Review of the Electrical Safety Office and was further extended through an Issues Paper that sought public comment on the proposals. This option is considered to be appropriate in addressing the identified deficiencies in the current legislative framework.

The proposed provisions are a mixture of prescriptive requirements (where a specific practice is mandatory to ensure a safe outcome) and performance based legislation where the outcome is mandatory but

multiple pathways provide flexibility in meeting the outcome of the legislation.

The costs and benefits associated with Option 2 are analysed below. The advantages of this option are that it:

- addresses identified gaps in the existing legislation leading to improved outcomes i.e. reduction in the number of deaths and injuries from electricity;
- provides employers, self employed persons and others with certainty by clearly identifying the outcomes to be achieved;
- sets appropriate electrical safety standards and provides consumer protection for the public where electrical work is carried out or where electrical infrastructure is installed in public areas; and
- allows employers, self employed persons and others a certain degree of flexibility in determining the measures to be adopted to control risks.

The areas to be covered by the proposed provisions are high-risk areas where significant numbers of incidents have previously occurred. Safety performance will improve in these areas if appropriate standards are set and enforced in a consistent manner that establishes industry benchmarks.

7.3 Option 3 - A reform package based on performance based standards (not preferred)

Option 3 involves the introduction of new performance based requirements that prescribe outcomes to be achieved with respect to certain hazards. This approach places the responsibility on the obligation holder to choose appropriate control measures that will ensure the required performance outcome is achieved in relation to electrical safety. An example of performance-based legislation is the obligation of an employer to manage risk of injury from performing manual tasks at the workplace. Section 28 of the *Workplace Health and Safety Act 1995* obligates an employer to ensure the health and safety of his/her workers at the workplace. This obligation includes the need for the employer to manage risk of workplace injuries, including those resulting from performing manual tasks.

There is no specific requirement in the Regulation to prescribe how the employer can discharge his/her duty in relation to manual tasks. However, to provide guidance for industry, the Government has published an

Advisory Standard on Manual Tasks. This Standard provides extensive information on the hazards of performing manual tasks and how to manage the risk of injury.

In other words while there is an obligation in the Act for the employer to achieve the performance outcome (i.e. ensure the health and safety of the worker), there is no prescribed way in the Regulation to discharge the obligation in the area of manual tasks. However, there is an Advisory Standard on the issue and the employer is considered to have met his/her obligation in relation to manual tasks if he/she does what the Advisory Standard says. Alternatively the employer may choose another way that gives the same level of protection against the risk. If the employer follows the way stated in the Advisory Standard this can be used as a defence in prosecution and civil litigation.

This approach could be adopted by setting out the performance based regulation for managing electrical safety risks such as preventing a person from the risk of electric shock while carrying out electrical work.

Under this option advisory guidelines such as the existing electrical safety guides would be available to provide practical guidance for obligation holder in meeting the requirements of the proposed stand-alone electrical safety regulation.

As with option 1, the main advantages of option 3 are that an obligation holder can exercise discretion in selecting appropriate control measures to manage the risk to achieve the objectives of the legislation. The development of suitable guidance material provides obligation holders with information on ways to identify and manage risks. This option ensures that obligation holders can develop customised solutions to achieve the mandatory electrical safety outcomes while stopping short of prescribing ways on how this is to be achieved.

In view of Queensland's poor electrical safety performance and industry feedback, it is considered that obligation holders require a greater degree of prescription in the proposed provisions than can be offered by this option. The lack of regulatory standards or outcomes has been criticised for making it more difficult for employers to decide exactly how and what they must do to meet their obligation

7.4 Costs And Benefits Of Option 2

As outlined earlier, the proposed provisions outlined in option 2, will be drafted to provide obligation holders with flexibility in the controls that can

be adopted to prevent or minimise risk of death or injury from electrical hazards and will specify standards that must be complied with in relation to certain controls if they are adopted.

The proposed regulation will compliment these obligations through identifying specific requirements to be met to ensure electrical safety. Stakeholders have indicated a preference for regulatory requirements that provide clarity and certainty for obligation holders on what is required. The business licensing requirements will ensure all providers embrace appropriate electrical safety and consumer protection requirements to meet obligations to their customers and assist in compliance programs. The proposed Regulation will be developed in a manner to influence compliance in a positive manner.

Stakeholder costs in complying with the proposed Regulation mirror the costs incurred through the imposition of obligations under the proposed *Electrical Safety Act*.

7.5 Assumptions

Throughout the RIS a discount rate of 6% and a time horizon of 30 years are assumed. Beyond this time line expenditure and revenue streams are considered negligible in present value terms.

Also, it is assumed that the proposals involve no additional administration costs. Existing resources can be redeployed to administer the proposals.

7.6 Impact on Stakeholders

7.6.1 Employers and Self-Employed Persons Carrying Out Electrical Work for the Public.

For businesses not covered by the present business licensing requirements for electrical installation work, costs relate to licensing fees and the mandatory insurance required under the electrical contractor licensing criteria. The businesses primarily affected would be those involved in appliance/ equipment repair activities such as whitegoods and electronic equipment.

Licensing requirements are such that an appropriately qualified person (endorsee) takes responsibility for the electrical safety and consumer

protection responsibilities of the business. With adjustment for inflation the administrative fee for a contracting licence is projected to be \$240.00 per annum. There are an estimated 850 additional businesses that would be captured by the requirement to hold a contracting licence. This was worked out by subtracting the number of already licensed contractors from the number of businesses in the relevant industries. The business numbers by industry data were obtained from the Australian Business Numbers (ABN) and are actual counts of ABNs.

For an average cost of insurance an estimate of \$900 is used, which can be considered as an upper bound to the true average.³ Also, an assumption that 10% percent of the 850 firms will have to obtain liability insurance under the new regime, although it is unlikely that the actual number would be this high, given that it would be very unwise for an business undertaking electrical work to operate without liability insurance.

Under the assumptions made, the estimated present value cost to the community of this requirement is \$4.1 million.

In the absence of the business licensing requirements customers such as a person engaging a business to repair an electrical appliance in their home would have to take steps to satisfy themselves that electrical safety standards are being met by the business offering the service. Benefits from the business licensing changes would be through the provision of consumer protection requirements, market confidence that suitable electrical safety standards are being met and corresponding electrical safety performance improvement. These benefits are unquantifiable.

7.6.2 Work Near Exposed Live Parts

As outlined previously, accidents involving persons carrying out activities near exposed live parts such as powerlines are a significant factor in Queensland's unacceptable electrical safety performance.

3 Within the electrical contracting industry an estimated 80% of businesses have a turnover of between \$285,000 and \$455,000 per annum. Indicative costs for this insurance range from \$650 for turnover of up to \$285,000, and \$1,095 for turnover up to \$455,000 per annum. GST and stamp duty are not included.

To address this situation it is proposed to include additional requirements regarding minimum approach distances based on nationally consistent standards. To provide further guidance a Code of Practice will also be developed.

Costs incurred in complying with this requirement reflect the costs if the requirements under the present legislation in terms of meeting an employer's obligation to ensure the safety of a worker under the *Workplace Health and Safety Regulation 1997* are met.

The cost of achieving compliance depends on the choices of control measure implemented by the employer or self employed person. The employer or self employed person retains the option to select the least costly control, subject to it meeting the stated outcome and regulated standards. The costs of managing the risks also relate to the situation where the work is being carried out.

For example where mechanical repairs are being undertaken on plug-in equipment the control measures may only involve removing the plug from a socket and ensuring that it is not inadvertently re-inserted while the work is being carried out. Where cranes are operating near overhead power lines control measures may include de-energising the line or having a safety observer when operating in proximity to power lines.

No costing is included for this issue as the Code of Practice will reflect recognised minimum criteria for addressing unacceptable risks to workers under obligations within the *Workplace Health and Safety Regulation 1995*. That is, it is a clarification of what is already required by the current legislation and imposes no additional cost.

Benefits from the proposed requirements include a reduction in the number of deaths and injuries, improved electrical safety performance, decreased property damage and inconvenience caused through accidents and incidents involving contact with live exposed live electrical parts.

7.6.3 Prohibiting “Live” Electrical Work Except in Certain Situations.

There is a requirement in the *Electricity Act 1994* to ensure the safety of persons carrying out electrical work. There is a similar obligation under the *Workplace Health and Safety Act 1995*. The proposed requirements are consistent with the present requirements. The major cost associated with the proposed restrictions relate to inconvenience that may be caused to business where an electrical circuit is isolated and increased time to

undertake the electrical work where electricity is disconnected or, alternatively, rescheduling the work to a convenient time.

The other costs are to employers or self employed persons carrying out electrical work where the work such as testing must be carried out with electricity supply connected. In these cases a documented “safe system of work” will need to be developed to address risks to ensure the work can be carried out safely. Costs associated with measures such as personal protective equipment and appropriate testing equipment are existing requirements under the *Electricity Act 1994*.

The intent of this regulation is to restrict live electrical work, except in circumstances where it is absolutely necessary. There are cases where businesses operating on a 24 hour basis influence the choice to carry out electrical work while electricity is connected so that there is minimum inconvenience. Currently many electrical workers in choosing to avoid inconveniences are choosing to adopt a risk that they do not fully appreciate or address. Because the proposal caters for cases where it is not practical to isolate electricity the only additional cost to the community will be the elimination of savings made by working live and avoiding minor inconveniences, particularly having to walk to and from the switchboard to isolate and reconnect supply. These costs are considered negligible.

The major benefit of this requirement is to remove uncertainty where a decision to isolate supply so that electrical work can be carried out safely is left to competitive forces in the market place. Other benefits from this requirement are a reduction in deaths and injuries as well as reduced property damage and inconvenience resulting from accidents and incidents involving electricity. There were 35 fatalities over the last ten financial years involving electrical work being carried out with electricity still connected.

The minor costs of inconveniences associated with this proposal will be far outweighed by these benefits.

7.6.4 Certification of electrical installation work forming part of a high voltage installation or within a hazardous area where there is increased risk of explosion.

The additional costs associated with this requirement relate to certification costs by an accredited auditor prior to connection to supply. It

is expected there will be a net community reduction in costs associated with this requirement compared to requirements under the existing legislation. The person or business benefiting from the service will incur the costs rather than the cost being spread across all electricity customers.

As there is an obligation on businesses carrying out the work to ensure the safety of the work, businesses carrying out this work would be expected to have access to appropriately skilled persons capable of certifying the safety of the work. Costs associated with the Department accrediting auditors will reflect the cost of administering the accreditation scheme. It is proposed that the cost of accreditation to certify electrical installation work for high voltage installations or hazardous locations be \$50.00 for a period of five years. It is estimated that the number of persons seeking accreditation would not exceed 100. Assuming a \$50 accreditation cost, which covers a person for five years, and 100 persons to be accredited, or 20 per annum, the estimated present value cost of this cost of the accreditations is \$14,600.

Last financial year the electricity distributors Energex and Ergon Energy spent an estimated \$220, 000 carrying out inspections of high voltage/hazardous installations. It is assumed that the cost of the independent audit will be not exceed what it costs Energex and Ergon to carry out these inspections. The burden is simply shifted to the users, and there is no additional cost to the community.

7.6.5 Network Operators – Safety Management Systems

The requirement for a network operator to develop a safety management system is consistent with the network operator's obligations to ensure safety under the Authorising Act. It also reflects responsibilities that exist under the *Electricity Regulation 1994*.

There will be additional costs associated with the requirement for an independent evaluation of the system's ability to meet the network operator's obligations under the proposed *Electrical Safety Act*. These costs reflect the cost of auditor accreditation by the Department and the cost of the auditor satisfying themselves that the network operator's obligations are met. In addition to initial evaluation this would involve periodic audits to verify performance.

As an approximation, the accreditation fee for auditors under a similar scheme for self-insurers for worker compensation administered by the Department is \$1000 for a period of 3 years. The fee reflects the cost of administering the accreditation process including confirming that the

accredited auditor is appropriately qualified and complies with the conditions of accreditation. Assuming that 6 auditors will have to be accredited, and that accreditation lasts three years, the cost of this is \$29,000.

Accounting for the cost of the auditing as well, the present value of the cost of this proposal is \$3.1 million. This estimate is based on an annual audit cost for the 6 affected firms of \$35,000 each, assuming an audit would take seven weeks (Monday to Friday) for a consultant paid \$1,000 per day. The requirement for safety management systems will benefit the community through reduced electrical incidents and related costs associated with electricity entity networks.

7.6.6 Incident Notification

The *Electricity Act 1994* requires that any case where a person receives an electric shock at a place, it is reported to the electricity distributor for investigation. The *Workplace Health and Safety Act 1995* requires that any serious bodily injury or dangerous event is notified to the Division of Workplace Health and Safety. This includes incidents of an electrical nature. Workplace Health and Safety Inspectors respond to these events.

The revised reporting criteria in the proposed *Electrical Safety Regulation* recognises the limitations of enforcing a requirement that all electrical accidents and incidents be reported. Serious electrical incidents and dangerous electrical events will be required to be reported. General electrical safety issues will be addressed through the requirement that an electricity network operator responds initially to an incident to “make safe” and to respond appropriately to an electrical safety concern raised by one of its customers.

This requirement is therefore not imposing any additional cost on the community. There will be cost benefits to the community from this amendment as employers will only have to report once in relation to both Workplace Health and Safety and Electrical Safety incidents.

7.7 Comparison of Costs and Benefits of Options 2 and 3

The costs imposed on the community under Option 3 are the similar to the costs and benefits outlined in components of Option 3. These relate to the revision of incident notification and reporting, the establishment of accredited auditing requirements for high voltage and hazardous area electrical installation work. Additionally, there are the differing costs and

benefits relating to performance-based regulations compared with the mix of prescriptive requirements for high-risk areas in Option 3. The requirements for safety management systems and contractor licensing are not included in Option 2.

The costs and benefits for incident notification and reporting and accredited auditors are the same as for Option 2. Option 3 imposes a net cost on the community of \$14,600 (accredited auditing) and a saving of \$4.1M (electrical contracting costs) and \$3.1M (safety management systems), a total of \$7.2M compared to Option 2.

7.7.1 Comparison Costs and Benefits of Performance-based Regulation

Compared with the benefits of Option 2, Option 3 provides for reduced community costs through increased flexibility in meeting the outcomes outlined in performance-based regulation. This type of approach places the responsibility on an obligation holder to choose appropriate control measures to ensure the required outcome is achieved for electrical safety.

As with Option 1, the main cost advantage of Option 3 is that an obligation holder can exercise discretion in the controls selected to manage risks to achieve the objectives of the legislation. The existence of industry guidelines that do not have legal status provides obligation holders with information on ways to identify and manage risks. Option 3 provides obligation holders the ability to develop a customised electrical safety solution to meet the required safety outcomes. These reduced costs will be offset by a corresponding reduction in electrical safety performance and consumer protection provided through contractor licensing. Experience is that, for high-risk areas performance-based regulation has been ineffective in providing the necessary guidance to achieve the required safety outcomes.

For example, the *Electricity Regulation 1994* contains requirements to ensure safety in the high-risk area of performance of electrical work. This is supplemented by industry guidelines that do not have legal status. There have been 35 fatalities over the last 10 financial years involving electrical work being carried out with electricity still connected even though there is a performance-based requirement and industry guidelines to ensure safety.

A recent audit of electrical contracting safe work practices identified widespread non-compliance with the current performance-based outcomes to ensure worker safety. Stakeholders and reviews have criticised the lack of prescriptive requirements such as limiting live electrical work. They cite

poor safety performance in high-risk areas due to lack of clarity in cases where market forces can adversely influence safety through competition for work and difficulties in developing effective compliance strategies for high-risk areas where prescriptive requirements are not specified.

In areas where the market is “uninformed” a performance-based approach in areas such as consumer protection is likely to lead to decreased electrical safety standards as persons compete for work based on costs in an environment where regulatory standards are non specific. Licensed electrical contractors that perform maintenance/repair work as well as installation work are critical that, through licensing, they provide for consumer protection and a higher level of safety, placing them at a disadvantage to businesses that are not licensed.

Given Queensland’s relatively poor electrical safety performance it is not considered appropriate to base electrical safety requirements on performance-based regulation in high-risk areas, particularly where competitive market forces can adversely affect safety performance.

8. CONSISTENCY WITH AUTHORISING LAW & OTHER LEGISLATION

8.1 Consistency with Authorising Law

The regulatory reforms in this RIS seek to prevent or minimise a person’s exposure to risk of death or injury from electricity by introducing a package of reforms that will target high-risk electrical hazards and improve the mechanisms that support the enforcement framework. These are consistent with:

- the objective of promoting electrical safety in the *Electricity Act 1994*; and
- the main purpose of ensuring the electrical safety of electrical workers, other workers, customers and the general public in the *Electricity Regulation 1994*.

The regulatory reforms will also be consistent with the proposed objective of the *Electrical Safety Bill 2002* to prevent the death and injury of persons by electricity. This objective will be achieved in the *Bill* through:

- preventing or minimising a person’s exposure to electrical risk at electrical places; and

- establishing a framework for preventing or minimising a person's exposure to risk by, among other things, imposing obligations on certain persons who may affect the electrical safety of others by their acts or omissions, and by allowing for the making of regulations.

8.2 Consistency with Other Legislation

The proposed regulatory reforms for electrical safety are not inconsistent with other legislation in Queensland.

9. COMPARISON WITH INTERSTATE JURISDICTIONS

The proposed regulations are uniform with the requirements in other States where national standards exist.

Each State and Territory has legislation that regulates electrical safety. The major differences between the proposed regulations in this RIS and the regulations of other States are:

9.1 Electrical Contractor Licensing

All States require an electrical contractor's licence to perform electrical installation work. New South Wales and South Australia have requirements for electrical contracting work which are additional to electrical installation work.

South Australia has restricted electrical contractor licences for specific work areas such as refrigeration/air conditioning and instrumentation.

In NSW a contractor licence is required for all "specialist work" done other than as an employee. "Specialist Work" includes supervising or carrying out work involving installing, repairing, altering, removing or adding to an electrical installation as well as the work associated with air conditioning/refrigeration equipment other than single-phase plug-in equipment.

9.2 Working on Live Electrical Parts

Requirements prohibiting live electrical work have been introduced in New South Wales. The New South Wales prohibition contains an

exemption if the work is carried out in emergency situations under a safety plan that addresses all safety aspects of the work enabling the work to be undertaken safely. Western Australia is consulting with stakeholders regarding the introduction of similar provisions.

9.3 Working Around Exposed Live Electrical Parts

Requirements for working around live parts exist in all jurisdictions. The proposed requirements are nationally consistent with the recently developed Electricity Association of Australia standards in the National Guidelines for Safe Approach Distances to Electrical Apparatus.

9.4 Second-hand Electrical Equipment

The occupational health and safety legislation in all States imposes an obligation on suppliers of plant to make available adequate information concerning use, design and construction of plant. However, no other State requires second-hand suppliers to provide safety information within its electrical safety legislation.

9.5 Safety Management Systems

Safety management systems have been introduced in New South Wales, Victoria and Western Australia. The proposed provisions are consistent with the requirements in these States.

9.6 Incident Notification and Reporting

The proposed regulations are consistent with the substantive provisions in all States.

9.7 Accredited Auditors

The requirements for an independent certification for high-voltage and hazardous electrical installation work have not been introduced in electrical safety legislation in other States. This work is carried out by inspectors from either the electrical distributors or government. Victoria requires that safety management systems be independently audited and New South Wales is considering a similar requirement.

10. FUNDAMENTAL LEGISLATIVE PRINCIPLES

The *Legislative Standards Act 1992* outlines fundamental legislative principles that require legislation to have sufficient regard to the rights and liberties of individuals and the institution of Parliament. It is considered that the proposed regulation in Option 2 has sufficient regard for these principles. The drafting of any legislation would include an assessment of whether the legislation has sufficient regard for fundamental legislative principles.

11. NATIONAL COMPETITION POLICY

11.1 Competition Principles Agreement

The Queensland Government is party to the *Competition Principles Agreement* agreed to by the Council of Australian Governments in 1995 (amended in 2000). The guiding principle of this agreement is that legislation should not restrict competition unless it can be demonstrated that:

- the benefits of the restriction to the community as a whole outweigh the costs; and
- the objectives of the legislation can only be achieved by restricting competition.

11.2 Public Benefit Test on restrictive provisions of Electricity Act 1994

The safety and licensing aspects of the *Electricity Act 1994* have recently undergone a National Competition Policy (NCP) Public Benefit Test. The report found that “continuation of a licensing regime is justified to ensure the electrical safety of workers, customers, and the general public. This reflects the likelihood and potential consequences of market failures...”. The restrictive components placed on competition by the existing regulations were considered justifiable due to the net benefit provided to the community.

11.3 New provisions

Currently an electrical contractor's license is required for electrical installation work such as wiring or installing a ceiling fan. However, a contracting licence is not required for electrical repair work on equipment such as whitegoods, videos and televisions. This is an inconsistency, as only licensed electrical workers are authorised to perform both types of work in homes and businesses and business owners of both groups should provide for the same level of consumer protection. It is beneficial to re-consider the key arguments for contractor's license in the public benefit tests to see if they are applicable to contractors performing electrical repair work on equipment such as white goods, video and televisions.

11.4 National Competition Policy (NCP) considerations

In summary, the public benefit test argued that the regulation of contractor's license is:

- significant transaction costs;
- information asymmetry;
- protection of third parties; and
- provider failure to perform.

11.4.1 Significant transaction costs

Apart from the fee for the service provided, there are transaction costs borne by consumers. These include: the search costs associated with locating a suitable service provider; negotiating costs in reaching agreement as to the nature and cost of the work; the costs of confirming the terms of the contract have been fulfilled, and if not, the costs of rectification (possibly including legal costs).

There is a cost of searching out potential service providers, and consumers will only undertake such costs if the expected benefit outweighs the costs. In certain markets with which the consumer is unfamiliar or an infrequent visitor, the costs of search may be high relative to the benefits so that only a limited amount of search will be undertaken, exposing the consumer to greater price and quality risk than if a more extensive search were undertaken. If search costs were lower, more searches would be undertaken and the greater the benefit the consumer would expect to receive in exchange for costs outlaid.

Consumers, having located an electrician, are unable to determine their precise requirements, the quality of the service provider and to compare the price and other merits of the alternatives offered (value for money). Moreover, they may not be qualified to judge the quality dimensions of the work performed (in terms of functionality and safety) and may need to incur significant costs if seeking independent verification of quality.

Occupational licensing schemes have been justified in terms of both reducing the costs of search and increasing the benefits of search: that is of reducing transactions costs borne by consumers from that which would be incurred in a competitive market. The possession of a license is a signal, but not a guarantee, to the consumer that the person has a minimum level of competency. This reduces the need (and the cost) for consumers to assess the relative quality of alternative service providers. Through such a mechanism, consumers may be able to share the costs of searching for service providers. If the licensing arrangements contain consumer complaint provisions and disciplinary actions, this may be a more cost-effective method of obtaining redress than reliance on general consumer protection legislation and legal procedures.

11.4.2 Information asymmetry

Another argument for a contractor's license is based on the idea of asymmetric information. The provider of the service knows more about the nature and quality of the service than does the client. This is somewhat related to transactions cost since lack of information by clients adds to the costs of verifying the quality of competing providers and the quality of the work performed. This is particularly relevant in relation to electrical services as generally these factors can only be assessed after the services have been provided, by which time it may be too late.

The opportunities for exploitation of clients or consumers are particularly high where the product or service is complex and purchased infrequently, such as electrical appliances or connection to an electricity supplier. The costs are particularly high where the purchase is expensive, when poor services have costly or dire consequences, including fatality, and remedial action is either costly (for example, seeking compensation through the courts).

Licensing, it is argued, increases information by establishing minimum standards for entrants. In effect, all license holders meet certain minimum requirements or qualifications. This reduces the need for the consumer to

obtain further independent assurance that the contractor or worker is competent.

11.4.3 Protection of third parties

In the case of electrical work, the effects of poor quality work can have impacts extending beyond the customer of the service. Another member of, or visitor to, the household could be injured through poor workmanship resulting in an unsafe situation. A contractor's licensing system that ensures that holders possess a given degree of competence can be seen as fulfilling a public safety objective.

11.4.4 Provider failure to perform

Aside from transaction costs and difficulties of determining service quality, there are significant financial and safety risks to consumers that arise as the service provider may fail to meet the terms of the service agreement in full. Such risks are broader than safety risks. Occupational regulation schemes may seek to protect consumers (and service providers) against the risks of financial loss, substandard work and injuries through poor health and safety practices.

To protect consumers against the financial risks of dealing with a service provider, licensing regulations include a range of entry requirements, license conditions or disciplinary procedures. To reduce the risk of fraud, applicants for a license are commonly required to pass a 'fit and proper person' test that is quite independent of the qualifications of the person to perform the service. In determining this, the authority may consider such things as the applicant's criminal record or record of compliance with the regulations. This is based on the proposition that past behaviour provides a reliable indicator of future behaviour and by excluding individuals who have revealed a propensity for dishonesty, the future incidence of dishonesty will be reduced.

Business licensing schemes also include provisions designed to reduce business risks, which are only indirectly related to consumer protection and safety objectives. It is common for licensing schemes to require that applicants satisfy a threshold level of financial resources so as to reduce the possibility of the licensee becoming insolvent while liable to the consumer. It is often supported by constraints on persons who are bankrupts, or directors of companies recently wound up, from being licensed.

In many areas, standards of technical competency are mandated to reduce the risk of substandard work being systematically performed. This risk is reduced by the requirement that an applicant for a license or registration must have completed a prescribed course of training or hold prescribed qualifications.

11.5 Cost of Preferred Option

The preferred option will ensure that consumers are protected for all electrical work. Under the current regulation, electrical contractors are required to meet financial and insurance requirements to undertake electrical work for the public. Applicants must have public liability insurance of at least \$5M, net realisable assets or a bank guarantee of \$5,000 for an individual or partnership and \$10,000 for a corporation.

11.6 Disciplinary action on license holders

The Electrical Workers and Contractors Board can take disciplinary action against a licensed electrical contractor where they:

- performed or permitted work to be performed, in a negligent, unsatisfactory or incompetent way;
- unreasonably delayed rectifying a fault found through an inspection; and
- hide inferior work or materials used in the electrical work.

The Electrical Workers and Contractors Board when taking disciplinary action can:

- cancel or suspend a licence for a period;
- reprimand or caution the contractor; and
- impose a fine of not more than 20 penalty units.

Currently, there are 4,665 contractor licences issued by the Electrical Contractors and Workers Board. Extending requirement for contractor licences to repairers has been estimated to increase this to 5,509.

11.7 Outcomes of NCP consideration

Fundamental to the National Competition Policy analysis is whether any of the options under consideration can meet the relevant policy objectives

i.e. to protect persons from the risk of death or injury due to electric shock and provide consumer protection for electrical work. If more than one option can do so, which one does so with the least adverse effect on competition?

Option 2 is the only option that will meet the objective of ensuring consistent consumer protection for all aspects of electrical work. As licensed electrical workers are the only workers who can undertake electrical work such as repairs on refrigerators and video recorders, the only additional restrictions on entry to the market that will be introduced under Option 2 are the financial and insurance requirements.

This Option will also remove the existing inconsistency between the consumer protection and business requirements for persons conducting electrical installation work and those conducting other types of electrical work. This is consistent with the recommendations of the NCP Public Benefit Test Report.

Options 1 and 3 provide a form of consumer protection, in that, the Electrical Workers and Contractors Board can discipline a licence holder for negligent, unsatisfactory or incompetent work. However, they will not provide consumer protection (in cases of provider failure to perform) for the resultant cost of repairs to electrical equipment or buildings.

It is considered that while the remaining proposed regulations impose mandatory requirements on workplaces generally, they do not contain any measures that will result in a restriction to competition. The reforms are focused on enhancing the electrical safety of persons in workplaces and homes.

The preferred option will significantly impact on the achievement of the objectives of the legislation. The regulation will provide greater levels of consumer protection and aid in the prevention of risk to persons and property from electricity. The safety benefits to industry and consumers of the reform package will outweigh any restriction to competition that may result.

ATTACHMENT A

DETAILS OF PROPOSED REGULATION

A1 - Work Near Exposed Live Parts

It is proposed to include new provisions that will prescribe standards for persons who work near exposed live parts. The provisions will not be restricted to electrical workers or persons conducting electrical work but rather will apply to all persons who have a likelihood of, either directly or through any conducting medium, coming within:

- for high voltage (where there is a risk of electrical arcing without contact with the part) - the nationally uniform safe approach distance to an exposed live part; or
- for low voltage (other than an electric line) – contacting the exposed live part.

A part is:

- “exposed” where it is bare or not effectively insulated or guarded by a fixed barrier or an earthed metal shield; and
- “live” until it is isolated and proven to be de-energised and not likely to become re-energised. If the part is a high-voltage conductor it is considered live until it is earthed.

The requirements for work near a low voltage overhead electric line (not including an electrical worker working on the line) will be a minimum approach distance of 3000mm if the electricity entity/owner of the line has not been consulted. The minimum approach distance following consultation would normally be 1000mm unless the work is being carried out in accordance with a safe system of work.

The provisions will impose an obligation for electrical safety on an employer or a person in control of an electrical installation, works of an electricity entity or electrical equipment to minimise risk to persons working near exposed live parts.

A code of practice will also be developed to provide practical guidance on all aspects of work near exposed live parts and work activities such as tree trimming and crane operations around power lines.

A2 - Working Near Exposed High Voltage Conductors or Electrical Equipment

The requirements for electrical work near exposed high voltage conductors of electrical installations or electrical equipment are contained in sections 128 to 131 of the *Electricity Regulation 1994*. It is proposed to amend these provisions to include all work near exposed high voltage situations.

Further, the approach limits to exposed high voltage conductors or electrical equipment in section 131 of the *Electricity Regulation 1994* will be amended as follows to be uniform with the nationally developed standards:

Nominal phase to phase ac Voltage (kV)	Safe approach distance (mm) for persons other than electrical workers working on the works of an electricity entity, electrical installation or equipment.	Safe approach distance (mm) for electrical workers working on part of the works of the electricity entity, electrical installation or equipment.
1 - 11	No consultation with Electricity Entity/ owner of the line/ installation or equipment - 3000	700
22	With consultation with	700
33	Electricity Entity/ owner of the line/ installation or equipment - 2000	700
50	3000	750
66	3000	1000
110	3000	1000
132	3000	1200
220	4500	1800
275	5000	2300

330	6000	3000
400	6000	3300
500	6000	3900
Nominal dc Voltage (kV) to earth		
+/- 25	3000	700
+/- 85	3000	1000
+/- 150	3000	1200
+/- 270	4500	1800
+/- 350	5000	2500
+/- 400	6000	2900

A3 - Restricting “Live” Electrical Work

High-voltage live line work will be addressed separately to the general requirements for working live. The proposed provisions will place an obligation on employers and self-employed persons (including electrical contractors and electricity distributors) to ensure that all electrical work:

- is performed in accordance with a safe system of work; and
- is not performed while the electrical installation, electrical equipment, works of an electricity entity or part thereof being worked on is live. A person must treat exposed conductors as live until they are isolated and proved to be de-energised, and if they are high voltage conductors that they are earthed.

A person will be permitted to work live where:

- it is not practicable to work de-energised or the risk would increase if the electrical installation, electrical equipment or works of an electricity entity was de-energised. The phrase “not practicable” is intended to encompass situations where supply is required to perform the work or that there is no other reasonable alternative to working live; and
- the employer or self-employed person has ensured that:
 - a safe system of work is in place;

- a written risk assessment of the “live” electrical work is prepared;
- the work is authorised only after consultation with the person in control of the electrical installation, electrical equipment or works of an electricity entity;
- the person performing the work is qualified and trained in safe work practices for the work being performed;
- testing equipment and tools appropriate to the work being performed are provided, maintained and used;
- clothing and personal protective equipment appropriate to the work being performed are provided, maintained and used;
- the isolation point of the electrical supply has been identified and is accessible;
- the work area is clear of obstructions to enable easy access and egress; and
- unauthorised persons are prevented from entering the work area by signs and/or barriers.

The working live requirements will refer to a “safe system of work”. This term is used to describe a document that contains strategies to ensure the safety of electrical workers, electrical contractors and others while working on electrical installations, electrical equipment and works of an electricity entity. A safe system of work for low-voltage electrical installations is one that is in accordance with AS/NZS 4836 “*Safe Working on low-voltage electrical installations*”.

A4 - Safety Management System

A safety management system is a system developed by an electricity distributor or transmitter that details hazards and risks associated with the design, construction, operation and maintenance of the entity’s assets. The system is prepared in consultation with workers and contractors, and is independently validated to determine that the entity’s hazards and risks have been fully addressed.

Due to the increasing difficulties faced with introducing a legislative framework that specifies the outcomes to be achieved in complex workplaces the proposed provisions will introduce a mandatory

requirement on electricity distributors and transmitters to develop a safety management system.

The proposed provisions will prescribe the criteria and requirements for a safety management system. A prescribed electricity entity that has a safety management system approved in another State will satisfy these requirements. However, the distributor's or transmitter's audits must extend to Queensland and a copy of the safety management system and their annual audit plan must be provided to the chief executive of the Department of Industrial Relations in line with other prescribed electricity entities.

There will be a requirement that an accredited auditor undertakes an initial evaluation and on-going audits to confirm compliance with the legislation.

The proposed provisions will also prescribe the requirements for persons applying to the chief executive for appointment as an accredited auditor.

To provide sufficient time for distributors and transmitters to comply with the proposed provisions will commence two years after the *Electrical Safety Bill 2002* commences.

A5 - Electrical Contractor Business Licence

It is proposed that the provisions for electrical contractor licensing contained in sections 52 to 58, 60 to 64 and 80 of the *Electricity Regulation 1994* be amended to take account of the following matters:

- the requirements to hold an electrical contracting (business) licence be extended to include all electrical work contracted to the public. However, there will be an exemption for Building Services Authority licence holders in categories of electrical work other than electrical installation; and
- the current requirements to qualify for a licence be amended so that they relate to the class of electrical work carried out by the business such as installation work or equipment repair/ maintenance.

This amendment will primarily affect appliance repair businesses such as whitegoods and electronic repairers.

A6 - Suppliers of Second-Hand Electrical Equipment

The regulation of second-hand electrical equipment contained in sections 34 to 37 of the *Electricity (Electrical Articles) Regulation 1994* will be amended. It is proposed that:

- the requirement to “label” be replaced with a requirement to “supply information” on whether the equipment has been tested and shown to be safe. This amendment will ensure the provision is consistent with a supplier’s general obligation under the *Electrical Safety Bill 2002* to supply information for safe use; and
- the requirement to certify that the electrical equipment has been tested and found electrically safe in an approved form will be removed (section 35(3)).

A7 - Accredited Auditors to certify electrical work on high voltage installation or within a hazardous area and Safety management Systems

It is proposed to introduce new provisions for the independent auditing of electricity entity’s safety management systems and the inspection and testing of high voltage electrical installation and hazardous location installation work. The *Electrical Safety Bill 2002* provides for the appointment of accredited auditors to:

- conduct audits of a prescribed electricity entity’s safety management system; and
- inspect and test high voltage electrical installations and hazardous locations such as new petrol stations or spray booths prior to connection to a supply of electricity.

In the case of inspection and testing of high voltage electrical installations and hazardous locations, there will be a requirement that the accredited auditor who inspects and tests the work must not be the same person who did the work.

The proposed regulation will specify the criteria and requirements that will apply for a certificate of appointment as an accredited auditor. The criteria will include demonstrated knowledge and skills and/or where appropriate successful completion of an approved course of training.

A person will be able to apply to the chief executive for a certificate of appointment as an accredited auditor. The chief executive may grant a

certificate for a term not more than 5 years on the conditions deemed appropriate.

The application must be made in the approved form and supported by sufficient information to enable the chief executive to decide the application.

The decision making process for renewal will be the same as for an initial application except the chief executive can refuse to renew if the certificate was issued in error, is false, misleading or omits a material particular or was obtained or made in another improper way.

A8 - Incident Notification

The notification requirements under the proposed Electrical Safety Regulation on an employer, self-employed person, person in control and occupier will mirror the format of the proposed amendments to the *Workplace Health and Safety Regulation 1997*.

The following reporting structure is proposed:

- a consumer will notify their distribution entity of electrical incidents and shocks. It will not be a regulatory requirement for a consumer (other than an employer or self employed person) to notify their distribution entity;
- an employer and self-employed person (including an electrical contractor) will not have a dual obligation under the *Workplace Health and Safety Regulation 1997* to report to the Division of Workplace Health and Safety (DWHS) in circumstances of an electrical shock;
- the distribution entity will, as soon as they become aware, notify the Electrical Safety Office of all serious electrical incidents and dangerous electrical events within 24 hours or immediately in the case of a fatality; and
- the distribution entity will have reporting requirements to the chief executive for all electric shocks and incidents notified to them by their consumers.

TITLE

Electrical Safety Regulations for the Rural Industry

INTRODUCTION

The rural industry is currently exempt from most of the provisions of the *Workplace Health and Safety Regulation 1997*⁴ (the Regulation), including Part 16 – Electrical Equipment and Installations. Part 16 of the Regulation prescribes ways of preventing or minimising exposure to the risk of electric shock from electrical equipment or electrical installations. Different requirements exist depending on the class of work being performed.

Under current legislative arrangements, employers and self-employed persons in the rural industry must comply with their workplace health and safety obligations under section 28 of the *Workplace Health and Safety Act 1995*. However, there is no certainty afforded to these employers about how to discharge their obligation in relation to electrical equipment and installations.

The Department of Industrial Relations is currently developing proposals for new electrical safety legislation to cover various places including workplaces. The provisions of Part 16 of the *Workplace Health and Safety Regulation 1997* will be integrated into the proposed electrical safety legislation. It is proposed that no exemption be provided to the rural industry under the electrical safety legislation.

The application of regulations to the rural industry will provide certainty to obligation holders in the rural industry about how to discharge their obligation relating to the prevention and minimisation of the risks associated with exposure to electrical hazards.

Between August 1990 and June 2001 there were 23 fatalities as a result of electric shock in the rural industry in Queensland. The proposed regulation is designed to reduce the incidence of fatalities and serious injuries experienced in the rural industry as a result of electric shock.

The Workplace Health and Safety Regulation 1997 defines the rural industry as follows:

4 The sections and parts of the Regulation that apply to the rural industry are contained in Part 17 – Miscellaneous of the *Workplace Health and Safety Regulation 1997*, section 167.

“rural industry” means an industry in which persons are engaged primarily in work—

- (a) in the cultivation of any agricultural crop or product whether grown for food or not; or
- (b) in the rearing and management of livestock; or
- (c) in the classing, scouring, sorting or pressing of wool; or
- (d) aquiculture; or
- (e) in flower or vegetable market gardens; or
- (f) at clearing, fencing, trenching, draining or otherwise preparing land for any purpose stated in paragraphs (a), (b) and (d) to (f).

BACKGROUND

Electrical Safety Regulations for the Rural Industry

In 2000, the Workplace Health and Safety Board, established under the *Workplace Health and Safety Act 1995*, endorsed an implementation strategy to progress the removal of the rural exemption from Part 16 of the Regulation.

The Rural Sector Standing Committee (RSSC) is a consultative body that provides advice to the Division of Workplace Health and Safety and to the Workplace Health and Safety Board on health and safety issues in the rural industry. The RSSC is comprised of representatives from the Queensland Farmers Federation, Farmsafe, The Australian Workers Union, the Queensland Dairy Framers Organisation, the Queensland Chicken Growers Association Inc., Queensland Canegrowers, Queensland University of Technology and Theodore Medical.

When recently consulted on the removal of the exemption for Part 16 the RSSC advised that 3 areas were of concern to the rural industry these were: that the proposed framework for the regulation of electrical safety did not contain a specific class of work for the rural industry; there was a preference that testing and tagging was not made a requirement for rural industry; and a perception that welders tripped safety switches. The Department of Industrial Relations’ (DIR) position on each of these issues is as follows:

The Classes of Work Framework

In the new electrical safety legislation the framework for the regulatory requirements associated with using specified electrical equipment revolves around 4 classes of work.

‘Specified electrical equipment’ will be defined as electrical equipment (which is connected to a socket outlet) with a current rating not exceeding 20 Amps.

The four classes of work are:

Class 1 work—

- (a) construction work regardless of the estimated final price at practical completion; or
- (b) work done in conjunction with the work mentioned in paragraph (a).

Class 2 work—assembly, fabrication, installation, maintenance, manufacturing, refurbishment or repair work.

Class 3 work - work that is not class 1, 2 or 4 work.

Class 4 work - office work.

The requirements for the fitting of safety switches and testing and tagging of equipment differ depending on the class of work conducted at a workplace⁵.

The major difference is that the fitting of safety switches **and** the testing and tagging of equipment (with a current rating not exceeding 20 Amps) is mandatory for class 1 and 2 work. When utilising specified electrical equipment to perform class 3 & 4 work however there is an option to select the type of protection to be utilised, i.e. an employer may either test and tag equipment **or** provide safety switch protection.

It is important to note and understand that the classes of work describe the performance of tasks/work being undertaken, not the nature of the workplace. There may be a number of different tasks and types of work being conducted on a rural property.

5 These requirements can be found in Divisions 3-5, Sections 150 – 164(4) of Part 16 of the *Workplace Health and Safety Regulation 1997*, commencing on page 128 of the regulation.

While the RSSC initially proposed that a separate class of work be developed for rural work, it is considered that the continuation of the existing framework in the context of classes of work is required to retain the integrity of the legislation.

The only unique “work” conducted utilising electrical equipment in a rural setting is that which is based solely on farming and agricultural production, eg. dairies, shearing, aquaculture and the intensive farming operations where heating and cooling equipment, watering equipment and feeding equipment are utilised in the raising and keeping of the livestock eg. piggeries, poultry production, etc. It is anticipated that this type of work would fall into class 3 which allows either safety switch protection or testing and tagging of equipment at prescribed intervals. In the majority of cases it is envisaged that testing and tagging will be the preferred option commercially as a safety switch trip that goes unrecognised for a significant period of time could jeopardise the health of the livestock concerned.

It is perceived that the most common type of work performed with electrical equipment in the rural industry is maintenance/repair type work which will fall into class 2 work. There is no demonstrated difference between the repair and maintenance work carried out in rural workshops to that being undertaken in other workplaces eg. engineering shops.

It is possible that all classes of work may be performed at an individual rural workplace. And as such there would be different legislative requirements for each different type of work being performed. For example class 2 work being undertaken in a rural workshop requires inspection testing and tagging of electrical equipment at prescribed intervals, however the equipment utilised for class 3 work in an intensive farming shed, undertaken at the same farm may be either inspected, tested and tagged (at different intervals to that of the equipment utilised for class 2 work) or protected with safety switches. This approach is based upon the extent of risk posed by the activity being carried out.

Testing and Tagging requirements

The RSSC expressed concerns that the costs associated with an electrical contractor undertaking testing and tagging, particularly in remote areas where travel also comes into the equation, would make such a requirement impractical and unworkable.

Once again consistency is being sought to maintain integrity in the requirements for the protection against electric shock across all industries.

The proposed regulation would result in testing and tagging to be undertaken by a competent person. A “competent person” means⁶: a person who has acquired, through training, qualifications, experience or a combination of these, the knowledge and skill enabling the person to inspect and test electrical equipment. It is acknowledged that this person may or may not be an electrical contractor.

The preferred option allows a phase in period for testing and tagging of 3 years which would allow ample time for either a rural employer or their workers to complete the necessary training required to qualify them as a competent person. This approach would assist in the avoidance of costs imposed by engaging an electrical contractor or other competent person in undertaking the inspection, testing and tagging.

Welders and Safety Switches

Safety switches are devices that continuously compare the current flow in both the active (supply) and neutral (return) conductors of an electrical circuit. If the current flow becomes sufficiently unbalanced the safety switch will trip and interrupt the supply of electricity. This will occur if there is a difference between the flow of current in the active conductor compared to the flow of current returning through the neutral conductor, due to earth leakage.

Safety switches are also known as residual current devices (RCDs) or earth leakage circuit breakers (ELCBs). **Safety switches are designed primarily for the protection of people from electrocution.**

Safety switches are not the same as fuses or overload circuit breakers. Fuses and overload circuit breakers are designed to protect the workplace against high current, short-circuit or overload faults that might result in fire.

The RSSC raised concerns that welders trip safety switches, particularly when they are operated with a power supply that is sourced from Single Wire Earth Return lines (SWER lines).

SWER lines are utilised in the more remote parts of the state to supply electricity. The difference between a SWER supply and standard power supply is that there is only one power line utilised and the return path is via the ground. In a standard supply there is a neutral conductor (2nd wire). The

6 This definition can be found in Schedule 9 of the *Workplace Health and Safety Regulation 1997*

SWER system can result in voltage drops and other problems due to the resistance of the ground when utilised as the return path.

The RSSC had proposed that a separate unprotected socket outlet should be allowed to be used exclusively for welding.

Testing by the Division of Workplace Health and Safety, in conjunction with the Electrical Safety Office of welders used on SWER lines revealed a number of reasons for tripping. Reasons included that the safety switch utilised had an overload (circuit breakers style function) function rated at 10 Amps and the welder was drawing 15 Amps which was causing overloading of the circuit and thus a trip of the safety switch. There were also other items on the shared circuit that displayed earth leakage and a combination of these other items leaking on the circuit would also be cause for the safety switch to trip.

A full report of the results of the testing can be read as Appendix 2.

Technical advice received from the Electrical Safety Office and the Welding Institute of Australia was that there was no valid reason for a welder to trip a safety switch unless the welder was either faulty or was used incorrectly.

These results highlight the need for protection in the event that faults are present. Therefore the proposal for unprotected socket outlets for welders has not been pursued in the development of the proposed legislation.

This RIS deals with the seven policy issues currently contained in Part 16 of the Regulation. It is important to note that whilst the only significant costs imposed from the removal of the exemption relate to the installation of safety switches and the inspection, testing and tagging of electrical equipment, all of the seven areas below become regulated. The costs associated with the removal of the exemption are detailed in the options section of this RIS. The RIS identifies Option 3 as the preferred option, on the basis that it will lead to improved electrical safety outcomes through the introduction of practical and achievable regulation. Specifically the introduction of the regulations will assist employers and self employed persons in the rural industry meet their workplace health and safety obligations by:

- ensuring cord extension sets and flexible cables are located where they are not likely to be damaged, or rendered unsafe;
- adhering to nationally consistent safe approach distances for workers other than electrical workers, when working near exposed overhead electric lines;

- having specified electrical equipment inspected, tested and tagged at prescribed intervals;
- protecting specified electrical equipment by connection to safety switches;
- undertaking periodical testing of safety switches; and
- not using double adaptors and piggyback plugs when undertaking certain types of work.

AUTHORISING LAW

Section 38 of the Workplace Health and Safety Act 1995 (the Act) provides the head of power for the making of a regulation. Section 38(2)(c) of the Act provides that a regulation may prescribe ways to prevent or minimise exposure to risk.

Under section 38(4) of the Act, a regulation may declare something to be a workplace health and safety obligation imposed upon a person for the Act. The penalties for failing to discharge an obligation are set out in section 24 of the Act.

It should be noted that whilst the authorising law at present is the *Workplace Health and Safety Act 1995* it is proposed that the intent of Part 16 of the *Workplace Health and Safety Regulation 1997* will form part of the electrical safety legislation, currently under development.

POLICY OBJECTIVE

The policy objective of the options outlined in this RIS is to prevent and minimise the number of electrical fatalities and injuries in the rural industry in Queensland.

Removal of the rural exemption for electrical equipment and installations will also provide certainty for rural employers and self-employed persons about how to discharge their obligations in relation to the risks associated with electrical hazards.

This action is in line with the proposal to incrementally remove the rural exemption contained in the *Workplace Health and Safety Regulation 1997*.

The 23 electrical related deaths experienced in the rural industry between August 1990 and June 2001 highlight the seriousness of the problem in Queensland's rural industries.

Whilst electrical safety regulation differs across Australia there are no other States or Territories in which the rural industry is exempt from the requirements of electrical safety regulation.

HOW THE POLICY OBJECTIVE WILL BE ACHIEVED

This RIS outlines three options for preventing or reducing fatalities and serious injuries caused from electric shock at rural workplaces. These options focus on the responsibilities of employers and self-employed people in regard to electrical installations and equipment in rural workplaces. The three options are as follows:

- Option 1 – Do nothing – No regulatory intervention
- Option 2 – Immediate removal of the exemption for the rural industry
- Option 3 - Removal of the exemption for the rural industry with:
 - a 3 year phase-in period for inspection testing and tagging requirements; and
 - a 1 year phase-in period for the use of safety switches.

The advantages and disadvantages of these options are examined in this RIS. While it is acknowledged that the costs of compliance with current Workplace Health and Safety obligations are already enshrined, the specific costs and benefits associated with Option 3 (the preferred option) are examined in detail.

CONSISTENCY WITH AUTHORISING LAW AND OTHER LEGISLATION

Consistency with Authorising Law

The objective of the Workplace Health and Safety Act 1995 is to prevent a person's death, injury or illness being caused by a workplace, workplace activity or specified high risk plant. The objective is achieved by preventing or minimising a person's exposure to the risk of death, injury or illness caused by a workplace, workplace activity or specified high risk plant.

The Act establishes a framework for preventing or minimising exposure to risk by, among other things, imposing obligations on certain persons

who may affect the health and safety of others by their acts or omissions, and by providing for the making of regulations.

The subordinate legislation examined in this RIS is consistent with the objective of the Act because it seeks to prevent or minimise exposure to the risk of death, injury or illness occurring as a result of electrical shock in the rural industry.

Consistency with other legislation

Queensland

The regulatory options outlined in Options 2 and 3 which contain reforms for electrical safety are not inconsistent with other legislation in Queensland.

Comparison with interstate jurisdictions

Queensland is the only State or Territory in Australia to offer an exemption to the rural industry on electrical workplace health and safety issues. In all other States and Territories in Australia the provisions for electricity prescribed by the different agencies apply equally to the rural industry as to other industries.

Electrical safety at workplaces is regulated in all jurisdictions with the exception of the Australian Capital Territory. A comparison of the provisions of other jurisdictions to the proposed regulations for Queensland is provided in Appendix 6.

OPTIONS FOR MANAGING RISK

Three options have been developed for inclusion in the RIS. These options are discussed below in terms of advantages, disadvantages and cost. Option 3 is the preferred option as it allows employers and self-employed persons in rural industries time to attain the experience and skills necessary to be a competent person to inspect, test and tag electrical equipment. It therefore reduces the cost to industry (particularly in “remote” and “very remote” areas) which would be experienced if an external contractor was needed to undertake inspection, testing and tagging of electrical equipment.

Option 1 – Do nothing – No regulatory intervention

To do nothing is to maintain the current situation where—

- employers and self-employed people have an obligation under the Act to ensure workplace health and safety. Section 22 of the Act provides that workplace health and safety can generally be managed by:
 - identifying hazards;
 - assessing risks that may result because of the hazards;
 - deciding on control measures to prevent, or minimise the level of the risks;
 - implementing control measures; and
 - monitoring and reviewing the effectiveness of the measures.
- the rural industry is exempt from regulations that prescribe ways of managing the risks associated with electrical installations and equipment, and thus a situation is fostered where employers and self-employed persons in the rural industry are unsure of how to discharge their obligations under the Act in relation to the risks associated with electrical hazards.
- the Division of Workplace Health and Safety produce brochures, safety links and other forms of educational material on electrical safety which are located on the Division's website. Rural inspectors also promote health and safety in regional areas through displays at regional shows and other appropriate forums. These forms of marketing would be relied upon to create an awareness and to educate employers in the rural industry of the dangers of electric shock in rural workplaces.

Advantages and Disadvantages of Option 1

The only advantage of Option 1 is that it offers a non-regulatory approach and it relies on industry gaining an appropriate amount of information and awareness to reduce the fatality and injury rate from the current education and awareness campaigns undertaken by the Department of Industrial Relations regarding electrical hazards. This approach has been unsuccessful in achieving reductions in injuries and fatalities to date.

This option is not likely to achieve the objectives of:

- preventing and minimising the number of electrical fatalities and injuries in the rural industry; or
- providing certainty for rural employers and self-employed persons about how to discharge their obligations in relation to the risks associated with electrical hazards.

The major disadvantage of Option 1 is that it does not prescribe any mandatory requirements for the rural industry in respect of the control of the risks associated with electrical installations and equipment in regard to electric shock.

In the short to medium term Option 1 would not sufficiently reduce the exposure to risk of death and injury from electric shock.

Associated Costs

There are minimal associated costs with this option.

Option 2 – Immediate removal of the exemption for the rural industry

Option 2 involves the removal of the rural exemption which would mean that all of the regulatory requirements currently contained in Part 16 of the Workplace Health and Safety Regulation will apply to the rural industry when this regulation is integrated into the new electrical safety legislation. The only difference being an amendment to the current definition of specified electrical equipment. The definition is being amended to capture all electrical equipment with a current rating not exceeding 20 Amps.

The major impact of having to comply immediately is that employers and self-employed persons in the rural industry would not have had sufficient time to gain the skills and experience of a competent person to inspect, test and tag electrical equipment.

Advantages and Disadvantages of Option 2

The main advantage of Option 2 is that it puts in place a regulatory framework that provides certainty for employers and self-employed persons about the ways to meet their obligations in the prevention and minimisation of exposure to the risk of electric shock from electrical equipment or electrical installations.

Option 2 also utilises the current “classes of work” framework, which is generally well understood and applied by industry.

The utilisation of the current framework also allows the unique rural work of intensive farming operations to fall within class 3 in which an option exists to utilise either inspection, testing and tagging or safety switch protection as their control measure against the risk of electric shock. The option to utilise testing and tagging rather than safety switch protection when conducting class 3 work is particularly important for intensive farmers as a safety switch trip that went unnoticed could seriously affect the health of livestock.

One of the disadvantages of Option 2 is that initially compliance levels would be low as the rural industry would take time to fulfil the requirements of the legislation.

The immediate application of the regulations would be likely to result in considerable cost to industry until such time as employers or their workers and self-employed persons have gained sufficient competence to undertake the inspection, testing and tagging of electrical equipment. These costs would arise from the engagement of suitably competent external contractors, which would include any associated travel costs in areas where these services are not readily accessible.

Option 2 will achieve the objective in the short to medium term however it would impose significant costs on part of the community that are additional to those of Option 3. In view of the additional cost, Option 2 is not considered to be the most effective option for reducing the human and financial costs associated with electric shock in the rural industry.

Associated Costs

There are many different types of farming operations that are conducted within the rural industry. These include animal farming, vegetable and fruit growing, nurseries and flowers, aquaculture (also known as aquiculture), sugar cane farming and many other crop growing and rural enterprises. Within these sectors the size of individual farms and enterprises also varies greatly.

For this reason attempting to equate a whole of industry cost was not achievable and as such has not been attempted. Rather a case study approach, which reflects what is perceived to be an average cost for an average size enterprise has been adopted in order to try and reflect an indication of the likely costs of compliance in various industry sectors.

An attempt has also been made to identify the extra burden placed upon “remote” and “very remote” employers due to the extra travel costs they would incur in gaining access to external contractors.

There are various ways in which the rural industry may choose to comply with the new regulation and dependant upon the decisions made by individual enterprises the costs will differ greatly. The variables include whether safety switch protection is chosen over testing and tagging as a control measure for class 3 work and whether or not employers and self-employed persons choose to become competent persons to inspect test and tag their own electrical equipment or they utilise the services of an external contractor to undertake the inspection and testing.

Appendix 5 contains tables that include the **costs** associated with Option 2 for various sectors of the rural industry **over a 10 year period**. Costings have been prepared to reflect a 10 year period as this is the life span of the proposed legislation in Queensland. It should also be noted that **the costs are in present value terms**. For each case study Table (a) reflects the cost if a decision was made to utilise an external contractor to undertake the inspection and testing of electrical equipment. Table (b) represents the cost if employers and self-employed persons choose to have either a worker or themselves trained to undertake the inspection and testing of electrical equipment (after a 3 year period).

Comment on Costing Data

In some of the case studies those enterprises that are located in “accessible areas” have a greater total cost over a ten year period than if the inspection testing and tagging was conducted internally. These greater costs would be due to the cost of the equipment to be utilised and the cost of training. This is not the case in most of the “remote” and “very remote” enterprises where the development of the inhouse expertise to undertake inspection, testing and tagging would be of a significantly lower cost than engaging external contractors. However, undertaking internal inspection, testing and tagging would be the most cost effective method in all situations if costings were calculated for longer periods than the 10 years utilised for these costings.

It is also normal that a return on investment for education undertaken takes a number of years to show increased returns.

In all of the case studies, with the exception of piggeries, properties located in accessible Shires could achieve compliance for between \$750.00 and \$2100.00 over a ten year period. This cost is irrespective of the form of

protection the employer or self-employed person chooses to utilise, and regardless of whether they inspect, test and tag equipment themselves after a 3 year period or engage an external contractor to inspect, test and tag their equipment for the entire 10 year period.

For those enterprises located in remote and very remote Shires costs are significantly reduced in all instances for those enterprises that choose to undertake their own inspection, testing and tagging after a 3 year period.

The base costing models utilised in developing these costs are attached at Appendix 1 including a table, which shows those Shires that are deemed remote and very remote.

Option 3 - Removal of the exemption for the rural industry with:

- **a 3 year phase-in period for inspection testing and tagging requirements; and**
- **a 1 year phase-in period for the use of safety switches.**

Option 3 involves the phased introduction of electrical provisions consistent with Part 16 of the *Workplace Health and Safety Regulation 1997*. The only difference to the proposal is that the definition of specified electrical equipment will capture all electrical equipment with a current rating not exceeding 20 Amps.

This option will allow employers and self-employed persons in the rural industry sufficient time to gain the skills and experience of a competent person to inspect and test electrical equipment.

This means that employers and self-employed persons would not need to engage an external contractor to undertake the inspection, testing and tagging of electrical equipment, but that these functions could be undertaken internally at little or minimal cost.

There is a need for testing equipment to be purchased and a course to be undertaken to gain the competencies required, however these initial costs negate the ongoing need to engage external contractors. An ability to undertake inspection testing and tagging internally is particularly attractive to remote and very remote employers and self-employed persons as it eliminates the significant travel costs incurred in accessing external contractors.

Advantages and Disadvantages of Option 3

See the section below on the costs and benefits of Option 3.

COSTS AND BENEFITS OF OPTION 3 (PREFERRED OPTION)

Up until recently the rural industry has been exempt from the requirements of the majority of the *Workplace Health and Safety Regulation 1997*. Removal of the exemption for Electrical Installations and Equipment (Part 16) is only part of an incremental removal of the entire exemption. The exemption for Part 10 – Noise has already been removed and these regulations now apply to the rural industry.

It is anticipated that the exemption will be incrementally removed in the coming 12 months. Whilst electrical regulation is important in its own right, it also makes up part of an entire policy objective for the rural industry to comply with all parts of health and safety legislation.

One of the major benefits of the entire policy objective is a change in culture of the rural industry to recognise workplace health and safety risks and apply appropriate control measures and management systems to manage the risks.

The Industry Commission's report *Work, Health and Safety* examined the issue of how the cost of work-related injury is distributed. The Commission estimated that in cases of traumatic fatality, individuals and their families bear about 60% of the cost, the community about 30%, and employers 20%.⁷ As incidents resulting from electric shock have a high probability of resulting in the death or disabling injury, it is considered that the proposed regulation would be of most benefit to people who operate electrical equipment or work near power lines in rural workplaces, as well as their families.

It is difficult to establish the likely benefits of a regulatory intervention when the outcomes are measured in "number of lives saved". The benefit to be gained from the regulatory intervention is a reduction in not only

7 Industry Commission, *Work, Health and Safety: Inquiry into occupational health and safety, vol. 1*, Australian Government Publishing Service, Canberra, 1995, p.19. Note: In assessing the distribution of the cost of injury and illness, the Industry Commission notes that percentages in some cases do not add to 100 because of rounding to the nearest 10 per cent.

fatalities but in serious injuries occurring as a result of electric shock. Quantifying a projection of the lives saved has not been attempted.

The policy issues that the new regulation would address are as follows:

1. General obligations placed on employers and self-employed persons

Existing provisions of Division 1, Part 16 of the Regulation prescribe ways to prevent or minimise risk. Division 1 states that the divisions (numbered 1 to 6) in the regulation do not deal with all circumstances that expose someone to the risk of electric shock from electrical equipment or an electrical installation. Employers and self-employed persons must therefore ensure that safety measures such as maintenance, which is not prescribed for, are carried out on electrical equipment and installations.

Division 1 of the regulation also states how persons can discharge their obligations. Under this division obligations can only be discharged by following the prescribed ways.

Proposal: Under the new electrical safety legislation, provisions relating to general obligations will apply to the rural industry.

2. The protection of cord extension sets and flexible cables

Division 2 of the Regulation applies to any work. In this division provisions for the protection of cord extension sets and flexible cables are prescribed. Employers or self-employed persons must ensure the employer's or self-employed person's cord extension sets or flexible cables are—

- located where they are not likely to be damaged, including where they are likely to be damaged by liquid; or
- protected against damage, including damage by liquid.

Proposal: Under the new electrical safety legislation, provisions relating to the protection of cord extension sets, flexible cables will apply to the rural industry.

3. Overhead electric lines

Division 2 of the Regulation also sets out provisions relating to overhead electric lines.

The current regulation prescribes that if the:

- employer or self-employed person; or
- employer's worker; or
- equipment being used by the employer, self-employed person or worker

is likely to come within 2m of an overhead electric line at the employer's or self-employed person's workplace, then the employer or self-employed person must consult with the relevant authority and comply with the safety precautions required by the authority. This provision does not apply to an electrical worker doing electric work.⁸

It has been proposed in the RIS being developed for the introduction of new electrical safety legislation for Queensland that provisions for overhead electric lines be amended. The proposal introduces nationally consistent safe approach distances for workers other than electrical workers, working near exposed live electrical parts and powerlines. The safe approach distances are contained in the Electricity Supply Association of Australia "*National Guidelines for Safe Approach Distances to Electrical Apparatus*".

The safe approach distances outlined in these guidelines are as follows.

Nominal phase to phase ac Voltage (kV)	Safe approach distance (mm)
Up to and including 33	3000 without consultation with Electricity Entity 2000 with consultation with Electricity Entity
50 to 132	3000
220	4500
275	5000
330 to 500	6000
Nominal pole to earth dc Voltage (kV)	Safe approach distance (mm)
+/-25 to +/-150	3000
+/-270	4500
+/-350	5000

⁸ Electric work is defined in the *Electricity Act 1994*.

+/-400	6000
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Information relating to the operation of plant near overhead powerlines is to be included in a Code of Practice on working near live exposed parts established under the proposed electrical safety legislation. The Code of Practice will provide general advice in relation to reducing the risks involved with the operation of plant near overhead electric lines. These provisions will be of particular benefit to rural industry as accidents with overhead wires are a major cause of rural electrical fatalities.

Proposal: Under the new electrical safety legislation, provisions for the rural industry relating to safe approach distances will be introduced. The *National Guidelines for Safe Approach Distances to Electrical Apparatus* will be adopted.

4. Inspection, testing and tagging of specified electrical equipment

Under the new electrical safety legislation ‘specified electrical equipment’ will be replaced by electrical equipment with a current rating not exceeding 20 Amps.

Prescribed intervals in Part 16 of the Regulation for inspection, testing and tagging of electrical equipment (with a current rating not exceeding 20 Amps) differ depending on the class of work conducted at a workplace (see Appendix 3).

There are four classes of work under the Regulation. These are:

Class 1 work -

- (a) construction work regardless of the estimated final price at practical completion; or
- (b) work done in conjunction with the work mentioned in paragraph (a).

Class 2 work—assembly, fabrication, installation, maintenance, manufacturing, refurbishment or repair work.

Class 3 work—work that is not class 1, 2 or 4 work.

Class 4 work—office work.

It is possible for all classes of work to be performed at an individual rural workplace. However, it is likely that class 2 work will be the primary class of work performed at rural workplaces, with the exception of those workplaces that conduct intensive farming operations.

A competent person must conduct the inspection, testing and tagging of electrical equipment (with a current rating not exceeding 20 Amps). Under the current regulation a competent person is defined as a person who has acquired, through training, qualifications, experience or a combination of these, the knowledge and skill enabling the person to inspect and test electrical equipment.

The Division has produced supporting industry guidance information to further clarify what constitutes a competent person (see Appendix 4). This document outlines seven competencies that an individual must have in order to demonstrate competency for the purposes of the regulation.

On the assumption that most of the work conducted on rural workplaces is class 2 work the inspection, testing and tagging interval for specified electrical equipment is:

- for equipment that is not double insulated – at least 6 monthly intervals; and
- for equipment that is double insulated – at least 12 monthly intervals.

Relatively short intervals such as these pose a problem in regard to the accessibility to competent persons. As many rural workplaces are geographically isolated it would be difficult for employers to find a competent person to attend the workplace and inspect, test and tag items of specified electrical equipment.

A suggested solution to this problem is to develop an accessible course that will allow rural employers and self-employed persons to obtain a qualification themselves or have workers obtain a qualification that will enable them to inspect, test and tag specified electrical equipment.

The Queensland Utilities and Service Industry Training Advisory Board (QUSITAB) has been working with the Division of Workplace Health and Safety to develop a course for the inspection, testing and tagging of electrical equipment. The course has been recently accredited by the Department of Employment and Training and is now available for Registered Training Organisations (RTOs) to deliver.

It is anticipated that this course will be accessible to persons in remote areas as Farmsafe Queensland have shown interest in delivering the accredited course as an elective of their Managing Rural Workplace Health and Safety Course. It is hoped that other rural organisations will also participate in delivery of the course.

It is likely that TAFE colleges throughout the State will elect to deliver the course which should also assist in making the course accessible in regional and rural areas.

Observation of the condition of the electrical equipment utilised in rural workplaces, suggests that there is substantial room for improvement. There was little evidence of any sort of inspection and maintenance regime in these workplaces for electrical equipment, during the research undertaken to cost the case studies. The equipment appeared to be in need of maintenance and similarly the general environment in which the equipment is operated appeared in most instances to contain dust, cobwebs and moisture, all of which can promote earth leakage problems. It is anticipated that the testing and tagging of electrical equipment in rural workplaces will help address these electrical safety issues.

Proposal: Under the new electrical safety legislation, provisions relating to the inspection, testing and tagging of specified electrical equipment will apply to the rural industry.

It is proposed that these provisions will not apply until 3 years from the commencement of the amendments to allow employers and self-employed persons in the rural industry to obtain themselves, or have workers obtain qualifications to inspect, test and tag specified electrical equipment.

5. Protection of specified electrical equipment by connection to safety switches

Divisions 3 to 5 of the Regulation prescribes the requirements for the use of safety switches depending on the class of work being performed. For the performance of class 1 and class 2 work there is currently a mandatory requirement for the use of type 1 or 2 safety switches (including portable safety switches).

For the performance of class 3 and 4 work there is currently an optional situation that allows employers and self-employed persons to connect specified electrical equipment to a type 1 or 2 safety switch (including portable safety switches) or to adhere to inspection, testing and tagging requirements.

Safety switches are one of the most effective methods of protecting against the dangers of electric shock through earth leakage and as such safety switch protection will be a major benefit in reducing the risk of electric shock in the rural industry.

Proposal: Under the new electrical safety legislation, provisions relating to the connection of specified electrical equipment to safety switches will apply to the rural industry.

It is proposed that these provisions will not apply until 1 year from the commencement of the amendments to allow employers and self-employed persons in the rural industry time to purchase and install safety switches.

6. Periodical testing of safety switches

Part 16 of the Regulation prescribes two types of testing for safety switches:

1. testing of the inbuilt test button (able to be completed by the employer or someone on behalf of the employer); and
2. tripping time (to be conducted by a competent person).

Intervals for each of these tests are prescribed in the Regulation and differ depending on the class of work the specified electrical equipment is used to perform. Testing intervals are provided in Attachment 3.

Testing of safety switches is essential to ensure that electricity supply is interrupted in the event of an incident.

Proposal: Under the new electrical safety legislation, provisions relating to the testing of safety switches will apply to the rural industry. These provisions would be introduced to coincide with the commencement of the provisions for installation of safety switches.

7. Use of double adaptors and piggyback plugs.

Provisions under the Regulation, for the performance of class 1 and 2 work, currently prohibit piggyback plugs and double adaptors. The rationale behind this prohibition is that these devices have an associated risk of overload when plugged into specified electrical equipment often used in the performance of class 1 and 2 work. Double adaptors and piggyback plugs have a current rating of 10 Amps. This rating is easily exceeded in the performance of class 1 and 2 work, as equipment utilised in these activities can often be rated at 10 Amps. Connection of two 10 Amp appliances will therefore exceed the current rating of the double adaptor or piggyback plug and pose a risk of overloading the circuit.

Proposal: Under the new electrical safety legislation, provisions relating to double adaptors and piggyback plugs will apply to the rural industry.

As stated previously, a case study methodology has been adopted in the costing models utilised as it is not possible to ascertain exact costs to the industry from the proposed legislation.

An attempt has also been made to identify the extra burden placed upon remote and very remote employers due to the extra travel costs they incur in gaining access to external contractors.

There are various ways in which the rural industry may choose to comply with the proposed regulations, therefore the costs will differ greatly dependant on the decisions of the enterprise. The variables include whether safety switch protection is chosen over testing and tagging as a control measure for class 3 work and whether or not employers and self-employed persons chose to become competent persons to inspect and test their own electrical equipment or utilise the services of an external contractor to undertake the inspection and testing.

Appendix 5 contains tables which include the **costs** associated with Option 3 for various sectors of the rural industry **over a 10 year period**. Costings have been prepared to reflect a 10 year period as this is the life span of the proposed legislation in Queensland. It should also be noted that **the costs are in present value terms**. For each case study Table (a) reflects the cost if a decision was made to utilise an external contractor to undertake the inspection and testing of electrical equipment. Table (b) represents the cost if employers and self-employed persons chose to have either a worker or themselves trained to undertake the inspection and testing of electrical equipment.

Comments on Costing Data

In some of the case studies those enterprises that are located in “accessible areas” have a greater total cost over a ten year period than if the inspection testing and tagging was conducted internally. These greater costs would be due to the cost of the equipment to be utilised and the cost of training. This is not the case in most of the “remote” and “very remote” enterprises where the development of the inhouse expertise to undertake inspection, testing and tagging would be of a significantly lower cost than engaging external contractors. However, undertaking internal inspection, testing and tagging would be the most cost effective method in all situations if costings were calculated for longer periods than the 10 years utilised for these costings.

It is also normal that a return on investment for education undertaken takes a number of years to show increased returns.

In all of the case studies, with the exception of piggeries, properties located in accessible Shires could achieve compliance for between \$550.00 and \$1700.00 over a ten year period. This cost is irrespective of the form of protection the employer or self-employed person chooses to utilise, and regardless of whether they inspect, test and tag equipment themselves or engage an external contractor to inspect, test and tag their equipment for the entire 10 year period.

For those enterprises located in remote and very remote Shires, costs are significantly reduced in all instances for those enterprises that choose to undertake their own inspection, testing and tagging. With the exception of piggeries (\$3914.67) “very remote” enterprises can gain compliance for between \$1100.00 and \$1700.00 if they undertake internal inspection, testing and tagging. In comparison to engaging an external contractor for the ten year period (\$3200.00-\$5100.00).

The base costing models utilised in developing these costs are attached at Appendix 1 including a table which shows those Shires that are deemed remote and very remote. Appendix 5 also shows a direct comparison between Option 2 and Option 3 for each of the case studies.

Option 3 imposes significant costs on part of the community, however it is considered the most practical option of reducing the human and financial costs associated with electric shock in the rural industry.

CONSISTENCY WITH FUNDAMENTAL LEGISLATIVE PRINCIPLES

The Legislative Standards Act 1992 outlines fundamental legislative principles that require legislation to have sufficient regard to the rights and liberties of individuals and the institution of Parliament. It is considered that the proposed regulation in Option 3 has sufficient regard for these principles. The drafting of any legislation would include an assessment of whether the legislation has sufficient regard for fundamental legislative principles.

NATIONAL COMPETITION POLICY

The Queensland Government is party to the Competition Principles Agreement agreed to by the Council of Australian Governments in 1995 (amended in 2000). The guiding principle of this agreement is that legislation should not restrict competition unless it can be demonstrated that:

- the benefits of the restriction to the community as a whole outweigh the costs; and
- the objectives of the legislation can only be achieved by restricting competition.

There are no anticipated restrictions on competition associated with the preferred option.

CONCLUSION

The Electrical Safety Taskforce final report *A Review of Industry Compliance with Electrical Safety Standards and the Investigation of Serious Electrical Incidents* noted that Queensland has the highest fatality rate from electrocution in Australia by a factor of at least two. The report went on to state that a “Comparison with some European countries indicate that Australia overall is proportionally worse. Therefore, Queensland consistently rates among the worst performers in the western world.”

Queensland is the only State with an exemption from electrical safety legislation for the rural industry. Data is not available to compare rural electrical fatalities between the States. However given Queensland’s overall fatality rates from electrocution, and the 23 deaths from electrocution in the rural sector between August 1990 and June 2001 provide a strong indication of the need for action.

This RIS examines 3 options for achieving a reduction in fatalities and injuries as a result of electric shock in the rural industries and has concluded that:

- Option 1 is not likely to reduce the number of fatalities and injuries associated with electric shock in the short to medium term.
- Option 2 will achieve the policy objective. However the option presents significant costs due to its immediate application.
- The RIS identifies Option 3 as the preferred option, on the basis that it will lead to improved electrical safety outcomes through the introduction of practical and achievable regulation.

The objective of the proposed amendment is to prevent fatalities and injuries caused by electric shock in rural industry. The application of electrical safety regulations to the rural industry is considered an effective means of achieving this objective.

APPENDIX 1–Base costing Models and Information

TABLE 1: Case study descriptions.

ANZIC classification	Total Number	Rural Industry Case Study	Equipment	Farm Buildings*	Switch board A**	Switch board B**	Items*
Nurseries, flowers and other	21,640	Plant Nursery	Heater fans, potting machine.	Sheds	1	1	7
				Workshop	0	2	6
		Flower Nursery	Heater fans, bunching machine, wrapping machine, guillotine.	Sheds	3	9	9
				Workshop	0	2	6
Vegetable and Fruit Growing	6,570	Fruit Farm	Single-phase equipment.	Sheds	0	3	6
				Workshop	1	2	6
		Winery	Pumps, presses, hand tools.	Sheds	1	2	6
				Workshop	1	2	6
Animal Farming	23,501	Piggery	Feed augers, ventilation fans, general maintenance tools, heater lights, heater pads, high pressure water blasters	Sheds	18	71	45
				Workshop	1	2	6
		Chicken Meat Farm	Plug-in heaters, feed augers, ventilation fans, hand tools, welder, drill press, grinder.	Sheds	4	10	27
				Workshop	1	2	6

		Beef Farm	Hydraulic crush, welder, hand tools.	Sheds	2	0	1
				Workshop	1	2	6
		Beef Feed-lot	Hand tools, bench drill, grinder, cut-off saw.	Sheds (mill)	0	3	0
				Workshop	2	5	6

* Each workshop was averaged to hold 6 items of equipment for testing and tagging. Additional specific items for each type of farm were then added to this.

** The number of switchboards was based on an average of 3 sheds per farm. Switchboard A – 3-phase circuits. Switchboard B – single-phase circuits.

TABLE 2: Costing the installation of RCDs and testing and tagging

ANZIC classification	Total Number	Rural Industry Case Study	Option A (\$)		Option B (\$)	
			Both T&T+	RCD ++	T&T+	Both RCD++
Nurseries, flowers and other	21,640	Plant Nursery	43	65	30	195
		TOTAL	108		225	
		Flower Nursery	50	65	30	455
		TOTAL	115		485	
Vegetable and Fruit Growing	6,570	Fruit Farm	40	130	30	195
		TOTAL	170		225	
		Winery	40	130	30	260
		TOTAL	170		290	
Animal Farming	23,501	Piggery	170	130	30	2860
		TOTAL	300		2890	
		Chicken Meat Farm	110	130	30	650
		TOTAL	240		680	
		Beef Farm	35	130	30	260
		TOTAL	165		290	
		Beef Feed-lot	30	260	30	325
		TOTAL	290		355	

+ The cost of testing and tagging equipment by an electrical contractor does not include repairs encountered during the procedure nor travel costs.

++ The cost of purchasing and fitting 4-Pole RCDs does not include travel costs for an electrical contractor.

OPTION A – The cost of testing and tagging all farm equipment including those items under Class 2 and Class 3, in addition to the costs of purchasing and fitting 4-Pole RCDs in those areas of the farm classified under Class 2 by an electrical contractor on a single visit (excluding travel costs).

OPTION B – The cost of testing and tagging only those items of farm equipment under Class 2, in addition to the costs of purchasing and fitting 4-Pole RCDs in all areas of the farm classified under Class 2 and Class 3 by an electrical contractor on a single visit (excluding travel costs).

TABLE 3: Case study descriptions.

ANZIC classification	Total Number	Rural Industry Case Study	Equipment	Farm Buildings*	Switch board A**	Switch board B**	Items*
Cotton Growing & Ginning, Sugar Cane Growing, Shearing, Other Crop Growing and Agricultural Services	15,197	Cotton Farm	Welders, cut-off/drop saws, hand tools.	Sheds	0	0	0
				Workshop	2	2	6
		Grain Farm	Welder, hand tools.	Sheds	0	0	0
				Workshop	1	2	6
Aquaculture	484	Hatchery and Ornamental Grow-out	Aerators, air pumps, heaters.	Sheds	0	10	45
				Workshop	0	2	6
		Grow-out Table Fish	Aerators, pumps, scales, refrigeration.	Sheds	0	2	30
				Workshop	0	2	6

* Each workshop was averaged to hold 6 items of equipment for testing and tagging. Additional specific items for each type of farm were then added to this.

** The number of switchboards was based on an average of 3 sheds per farm. Switchboard A – 3-phase circuits. Switchboard B – single-phase circuits.

TABLE 4: Costing the installation of RCDs and testing and tagging.

ANZIC classification	Total Number	Rural Industry Case Study	Option A (\$)		Option B (\$)	
			Both T&T+	RCD ++	T&T+	Both RCD++
Cotton Growing & Ginning, Sugar Cane Growing, Shearing, Other Crop Growing and Agricultural Services	15,197	Cotton Farm	30	195	30	195
		TOTAL	225		225	
		Grain Farm	30	130	30	130
		TOTAL	160		160	
Aquaculture	484	Hatchery and Ornamental Grow-out	170	65	30	325
		TOTAL	235		355	
		Grow-out Table Fish	120	65	30	130
		TOTAL	185		160	

+ The cost of testing and tagging equipment by an electrical contractor does not include repairs encountered during the procedure nor travel costs.

++ The cost of purchasing and fitting 4-Pole RCDs by an electrical contractor and does not include travel costs.

OPTION A – The cost of testing and tagging all farm equipment including those items under Class 2 and Class 3, in addition to the costs of purchasing and fitting 4-Pole RCDs in those areas of the farm classified under Class 2 by an electrical contractor on a single visit (excluding travel costs).

OPTION B – The cost of testing and tagging only those items of farm equipment under Class 2, in addition to the costs of purchasing and fitting 4-Pole RCDs in all areas of the farm classified under Class 2 and Class 3 by an electrical contractor on a single visit (excluding travel costs).

Caveat accompanying the tables:

As obtaining appropriate data for the calculation of costs to the rural industry of the full and complete adoption of the terms of the proposed electrical safety regulations is not possible, a case study approach has been

adopted to provide an indication of the nature of costs involved in adopting the proposed legislation. These estimations should not be interpreted as anything more than an illustration of the likely costs faced by individual enterprises in the rural industry in complying with the proposed legislation.

The case study approach involved identifying farms, which, on account of their medium size and relatively typical operations could be considered a model of the sector of the industry. It should be noted therefore that within the rural industry there would be cases of both smaller and larger farms in each sector. The data describing the number and type of switchboards and specified equipment on each farm was collected with the assistance of Rural WHS Inspectors.

- From Tables 2 and 4, detailing the costing of the installation of RCDs and the testing and tagging of equipment, it can be seen that Option A is almost always cheaper than Option B. However it should be noted that these tables outline the costs involved in a single visit by an electrical contractor. Over time the costs involved with testing and tagging would increase, as under the regulations these costs are an ongoing requirement, while the cost of compliance with the regulations for the installation of RCDs would diminish over time as RCDs would not require re-installation and fitting with each check by an electrical contractor.
- The costs of testing and tagging of farm equipment by a private electrical contractor is generally charged at an hourly rate incurring a cost of approximately \$40 an hour. Where the farm has only one or two items of equipment for testing and tagging the electrical contractor can charge a set cost of approximately \$5 for each item of equipment in order to minimise the costs for the farm.
- The Tables provide an illustration of the extent of the costs for inspection, testing and tagging of specified electrical equipment for various types of farms. As can be seen in the tables, there is considerable variation in the extent to which specified electrical equipment is used across the types. However, the costs of inspection, testing and tagging, even where the farm held a large number of specified electrical equipment items, was not excessive in these particular examples.
- For many in the rural industry it will be more economical for an individual at the farm to gain competency in inspection, testing and tagging of electrical equipment and to purchase the

necessary equipment, rather than to continue using the services of an electrical contractor. The costs involved in this initiative would approximate \$1054.67 and involve the following outlays:

- Insulation/Continuity Tester at approximately \$520.80.
- Safety Switch Tester at approximately \$423.87.
- Accredited training course at approximately \$110.00.
- It is anticipated that there would be a lag period between the introduction of new electrical safety legislation and the fulfilment of the conditions (outlined above) allowing the farm to perform their own inspection, testing and tagging. The testing and tagging costs detailed in the tables indicate the costs of a single visit by an electrical contractor and these costs need to be added for each subsequent visit from a contractor.
- The cost of connecting specified electrical equipment to a safety switch involves the cost of purchasing and fitting suitable 4-pole safety switches and is also dependent upon the number of 3-phase and single-phase circuits on that farm. A 4-pole RCD can be fitted to either three single-phase circuits or one 3-phase circuit. The Tables indicate the differences in costs where a farm has more or less of these two types of switchboards.
- The minimum requirement to meet the terms of the new electrical safety legislation would be the fitting of a 4-pole safety switch that offers earth leakage protection and costs \$50 (this figure excludes fitting costs, however the tables include the costs of fitting). More expensive 2-pole safety switches are available which offer overload protection however these are beyond the requirements of the legislation and therefore have not been examined in these costing tables.
- There is some evidence, from inspections undertaken by rural WHS inspectors and from the onsite visits of policy officers to farms, that installation of safety switches meeting the requirements of the proposed legislation have already occurred in the newer sheds on Queensland farms. This would mean the costs of meeting the terms of the legislation would be less for those farms and for the industry as a whole.
- Minimal costs are considered to be associated with the annual testing of safety switches given that the testing of safety switches will likely occur concurrently with the testing and tagging of

specified electrical equipment. The costs of either using an electrical contractor or gaining competency training to perform these tasks have already been accounted for.

Travel Costs

- According to the data (1996 census data) roughly nineteen per cent, or 12,663, farms are located in areas of Queensland classified as either 'remote' or 'very remote', using the Accessibility/Remoteness Index of Australia (ARIA).
- Those farms in areas classified as 'remote' make up roughly twelve per cent of all the rural enterprises effected by the proposed change to legislation, and are estimated to incur travel costs for electrical contractors of around \$96. Therefore this amount should be added to the estimation of any electrical work (ie. testing and tagging and the installation of RCDs) contracted at a farm in these areas.
- Those farms in areas classified as 'very remote' account for almost seven percent of all the rural enterprises effected by the proposed changes to legislation, and are estimated to encounter travel costs for electrical contractors in the vicinity of \$160.
- The remaining 54,729 enterprises in the rural industry potentially effected by the proposed changes to legislation are situated in areas classified as 'highly accessible', 'accessible' or 'moderately accessible' and would not face significant travel costs with the use of electrical contractors.
- As can be seen in Table 5, those remote statistical local areas with the highest proportion of affected rural industry include Mareeba (10.3%), Bowen (10.2%), Balonne (6.8%) and Taroom (5.7%).

TABLE: 5 Estimation of travel costs for electrical contractors to farms in 'remote' or 'very remote' areas.

Statistical Local Area	ARIA CODE*	Travel costs (\$)**	Number in Rural Industry	Proportion in Rural Industry
Aramac	VR	160	212	1.7%
Balonne	R	96	865	6.8%
Barcaldine	VR	160	112	0.9%
Barcoo	VR	160	125	1.0%
Bauhinia	R	96	555	4.4%
Belyando	R	96	514	4.1%
Blackall	VR	160	226	1.8%
Booringa	R	96	348	2.7%
Boulia	VR	160	116	0.9%
Bowen	R	96	1,292	10.2%
Bulloo	VR	160	142	1.1%
Bungil	R	96	515	4.1%
Burke	VR	160	68	0.5%
Carpentaria	VR	160	182	1.4%
Cloncurry	R	96	243	1.9%
Cook	VR	160	158	1.2%
Croydon	VR	160	33	0.3%
Dalrymple	R	96	522	4.1%
Diamantina	VR	160	60	0.5%
Emerald	R	96	607	4.8%
Etheridge	VR	160	195	1.5%
Flinders	VR	160	329	2.6%
Ilfracombe	VR	160	92	0.7%
Isisford	VR	160	57	0.5%

Jericho	VR	160	222	1.8%
Longreach	VR	160	287	2.3%
McKinlay	VR	160	271	2.1%
Mareeba	R	96	1,299	10.3%
Mornington	VR	160	3	0.0%
Mount Isa	R	96	127	1.0%
Murweh	VR	160	458	3.6%
Paroo	VR	160	303	2.4%
Peak Downs	R	96	261	2.1%
Quilpie	VR	160	259	2.0%
Richmond	VR	160	201	1.6%
Tambo	VR	160	125	1.0%
Taroom	R	96	725	5.7%
Torres	VR	160	18	0.1%
Warroo	R	96	259	2.0%
Winton	VR	160	277	2.2%
TOTAL			12,663	100%

* Accessibility/Remoteness Index of Australia: R – Remote (ARIA score >5.80 – 9.08) – very restricted accessibility of goods, services and opportunities for social interaction.

VR – Very Remote: (ARIA score >9.08 – 12) – very little accessibility of goods, services and opportunities for social interaction.

** Travel costs for country electrical work are based on the ‘electrical contractor travelling rate of \$16 per hour of travel (in excess of the first 25kms)’.

Farms located in ‘remote’ areas are estimated to require 3 hours travel time each way (after the first 25kms). Those farms situated in ‘very remote’ areas are estimated to require 5 hours travel time each way (after the first 25kms).

APPENDIX 2 - Investigation – Welders utilised on SWER lines

Background

The rural industry is currently exempt from most of the provisions of the *Workplace Health and Safety Regulation 1997*⁹ (the Regulation), including Part 16 – Electrical Equipment and Installations. Part 16 of the Regulation prescribes ways of preventing or minimising exposure to the risk of electric shock from electrical equipment or electrical installations.

The Department of Industrial Relations is currently in the process of developing electrical safety legislation which will contain the regulatory requirements currently addressed in Part 16 of the *Workplace Health and Safety Regulation 1997*. It is proposed that when this eventuates no further exemptions will apply for the rural sector in regard to those provisions previously contained in Part 16 of the *Workplace Health and Safety Regulation 1997*.

The Rural Sector Standing Committee (RSSC) is the primary conduit used by the Division of Workplace Health and Safety's (the Division) to consult with the rural sector. This committee is made up of a cross section of rural interests and provide advice to not only the Division but also to the Workplace Health and Safety Board.

The RSSC has raised an issue with the Division in relation to rural electrical regulation. It is the RSSC's opinion that welders trip RCD's, particularly when they are operated with a power supply that is sourced from Single Wire Earth Return lines (SWER lines).

SWER lines are utilised in the more remote parts of the State to supply electricity. The difference between a SWER supply and standard power supply is that there is only one power line utilised and the return path is via the ground. In a standard supply there is a neutral conductor (2nd wire). The SWER system can result in voltage drops and other problems due to the resistance of the ground when utilised as the return path.

In order to ensure that the concerns of the RSSC were examined, the Division in conjunction with the Electrical Safety Office determined that testing of welders on SWER lines should be conducted.

9 The sections and parts of the Regulation that apply to the rural industry are contained in Part 17 – Miscellaneous of the *Workplace Health and Safety Regulation 1997*, section 167.

The Division was assisted by both Farmsafe and the Queensland Farmers Federation who advertised throughout their networks to try and identify farmers who had problems with their welders tripping RCD's.

Only one farmer could be identified that reported having an issue with his welder tripping RCDs, and although a much larger sample group would have been preferred the Division determined that testing should occur at this site.

Testing Conducted near Roma

The owner of a property in the Roma Region participated in a testing exercise to determine why his welder was tripping an RCD. The power supply for the property was from SWER lines therefore, the property owner's situation was seen to be ideal in examining the claims of the RSSC.

On 21 May 2002 the testing was undertaken by an Authorised Person (Ergon Energy) and an electrical inspector from the Division of Workplace Health and Safety.

Results of Testing

The welder, utilised by the property owner was a 15 Amp MIG, and it was connected to a Portable RCD, Rated Protected Current - 10 Amps, Rated Earth Leakage Current – 15 Milli Amps (mA).

It should be noted that the standard for RCD protection in Australia is a rating of 30 Milli Amps (mA) which allows for twice as much earth leakage before the RCD trips than the RCD being utilised by the property owner. The RCD in the test case only allowed for 15 Milli Amps of leakage before it would trip. It is believed that the RCD being utilised was an old RCD of New Zealand origin.

Another important factor in relation to the RCD being utilised is that it had rated current protection of 10 Amps, ie. it would function like a circuit breaker and trip due to excess current. In other words this RCD tripped both for earth leakage (standard RCD protection) and if excess current was detected (like a circuit breaker).

The RCD was connected to a 10 Amp socket outlet installed on a mixed circuit (power and lighting). Also connected to the RCD was a Bench Grinder, a Bench Drill, a Plug Board, a Cut-Off Saw, an Electric Fence Energiser and an Extension Lead.

The RCD was tested using the in-built test button and tripped immediately, it was then tested using a Digital RCD Tester set to the 30 mA Half Rated Trip “No Trip” selection, a test was performed and the RCD tripped in approximately 25 Milli Seconds (mS). Another test was then performed using the 30 mA “Trip” selection and the RCD tripped in approximately 27 Milli Seconds (mS).

A weld was run with the welder and after a time, approximately 1 minute, the RCD tripped, and the cover of the unit was warm to touch, indicating an overload condition consistent with the 15Amp rating of the welder and the 10 Amp rating of the RCD. In other words it appeared that the RCD tripped because the welder required more current (15 Amps) than the Circuit Breaker Function of the RCD would allow (10 Amps) and as such the Circuit Breaker function of the RCD tripped.

The welder was tested for “Insulation” and a value of “Infinity” was measured. Which would indicate that when the welder was plugged into a socket outlet but not being operated it didn’t display any signs of earth leakage. The testing equipment utilised was not sophisticated enough to test for earth leakage when the welder was being operated.

The welder was then connected to a new Portable RCD – Rated Current 10Amps, Rated Residual Current 30 mA. The welder was connected and a weld run, the RCD did not trip.

The supply voltage was measured and found to be 240 Volts, another weld was run and the supply voltage measured and found to be 228 Volts, a drop of 12 Volts. The circuit current was then measured and found to be 17 Amps when welding and .33 Amps when not welding (welder and electric fence energiser connected). This drop in voltage could be the reason for the welder drawing more current than the 15 Amps for which it was rated. The important point to note from this information is that drawing more current increases the likelihood of a thermal overload trip eventuating.

All welding carried out with the welder connected to the new RCD did not result in an RCD trip.

The property owner also stated that the bench drill and the cut-off saw tripped the RCD.

To establish whether other items on the circuit may also be causing tripping testing was conducted on the other items in the circuit. The bench drill was connected to the new RCD via a system of extension leads and a plug board. As soon as the bench drill was started it instantly tripped the RCD.

An “Insulation Test” was performed on the bench drill and a reading of 1 Meg. Ohm was obtained. This would be sufficient earth leakage to trip an RCD in its own right and could also result in tripping when other equipment was being operated on the mixed circuit.

An “Insulation Test” was then performed on the extension leads and plugboard used to connect the bench drill and cut-off saw, and readings of “Infinity” were obtained, which indicated that when plugged into a socket outlet but not in operation these items displayed no evidence of earth leakage.

The cut-off saw was inspected and found to be “Double Insulated” a test was conducted between the “Active Conductors” and the “Exposed Metal” of the saw and a reading of “Infinity” was obtained, which once again meant that no leakage was evident.

It would therefore appear that the reason for the cut-off saw tripping the RCD was that the cut-off saw was rated at 10 Amps, and it was supplied through the 10 Amp thermal protection of the safety switch, in such a situation the cut-off saw may trip the thermal overload during periods of prolonged heavy cutting, especially when other equipment is connected to the safety switch.

Discussions with the Authorised Person (Ergon Energy)

The authorised person had considerable experience as an electrician (8yrs private contractor and 8 years in the supply industry) in the Roma district, which has a large network of SWER lines. The authorised person stated that in his experience he had not witnessed any problems with RCDs tripping welders. Furthermore the authorised person indicated that being on a SWER system as compared to a town feeder supply has no impact on welders tripping RCDs.

The authorised person stated that the main problems with SWER systems and welders are load related where there is generally too much load being drawn at the premises and this combined with the welder operating causes the transformer to become overloaded. This causes problems such as main circuit breakers tripping and voltage drop due to inadequate mains and sub-mains.

Conclusion

There are a two possible reasons that the safety switch in this test case would trip, these include:

- The safety switch was a combination earth leakage unit and a 10 Amp current protection rated unit, as such the current protection function tripped the RCD. In this instance tripping was not as a result of an earth leakage problem with the welder, but the 17 Amps of power the welder was drawing.
- The safety switch was rated at 15 mA, which is half the current Australian Standard. Safety switches are generally rated for 30 mA of leakage before tripping occurs. The welder was being used on a mixed circuit and the tests had proven that the bench drill was faulty and displayed earth leakage. The leakage from the bench drill was sufficient to trip the earth leakage function of the RCD.

Both of these situations were addressed by installing a 30 mA safety switch that did not have a load protection (circuit breaker) function, and by removing the bench drill from service.

It is concluded that given the length of time it took for the welder to trip the RCD; the fact that its was drawing up to 17Amp; and that the RCD unit was warm to touch following a trip, that the majority of tripping was as a result of activation of the thermal overload protection, which was only rated at 10 Amp. Consequently the suggestion that the use of welders on SWER lines causes inappropriate tripping has not been demonstrated through the tests conducted.

APPENDIX 3 -Inspection and testing intervals

Class of work	Specified electrical equipment	Type 1 or 2 residual current device	Type 1 or 2 portable residual current device
1	At least 6 monthly intervals by a competent person	<p>Inbuilt test button – immediately after it is connected and at least every month</p> <p>By a competent person at least every 12 months</p>	<p>Inbuilt test button – immediately after it is connected to a socket outlet and immediately before it is used for the first time on each day</p> <p>By a competent person at least every 12 months</p>
2	<p>If the equipment is not double insulated – at least 6 monthly intervals by a competent person</p> <p>If the equipment is double insulated – at least 12 monthly intervals by a competent person</p>	<p>Inbuilt test button – immediately after it is connected and at least every 3 months</p> <p>By a competent person at least every 12 months</p>	<p>Inbuilt test button – immediately after it is connected to a socket outlet and immediately before it is used for the first time on each day</p> <p>By a competent person at least every 12 months</p>
3	At least 12 monthly intervals by a competent person	<p>Inbuilt test button – immediately after it is connected and at least every 3 months</p> <p>By a competent person at least every 2 years</p>	<p>Inbuilt test button – immediately after it is connected to a socket outlet and at least every 3 months</p> <p>By a competent person at least every 2 years</p>

4	At least 5 yearly intervals by a competent person	<p>Inbuilt test button – immediately after it is connected and at least every 3 months</p> <p>By a competent person at least every 2 years</p>	<p>Inbuilt test button – immediately after it is connected to a socket outlet and at least every 3 months</p> <p>By a competent person at least every 2 years</p>
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APPENDIX 4: Safety link “Who Should Inspect, Test and Tag Electrical Equipment

From 1 July 1999, the *Workplace Health and Safety Regulation* requires employers and self-employed people to ensure that specified electrical equipment used to perform certain work is inspected, tested and tagged by a competent person. In Schedule 9 of the *Workplace Health and Safety Regulation*, a competent person for inspecting, testing and tagging specified electrical equipment means:

- (a) for electrical work under the *Electricity Act 1994* - an electrical worker; or
- (b) a person who has acquired, through training, qualifications, experience or a combination of these, the knowledge and skill enabling the person to inspect and test electrical equipment.

Employers and self-employed persons should be mindful that only an electrician is licensed to repair faulty equipment. Thus, an advantage of using an electrician to inspect, test and tag electrical equipment is that where the equipment is faulty, the electrician is licensed to repair it.

Alternatively, a person who has acquired the knowledge and skills to inspect and test electrical equipment through training, qualifications, experience or a combination of these may be deemed competent to inspect and test electrical equipment. The seven competencies required for inspecting and testing electrical equipment are:

1. Knowing about, and being able to carry out, a visual examination of electrical equipment in accordance with AS 3760 – *In-service safety inspection and testing of electrical equipment – 2000*.
2. Being able to distinguish between electrical equipment that is double insulated and equipment that is protectively earthed and identify the appropriate test for each type.
3. Being able to carry out the earthing continuity tests on electrical equipment in accordance with Appendix A of AS 3760 – 2000, while flexing the flexible cable.
4. Being able to carry out the insulation resistance tests on electrical equipment in accordance with AS 3760 – 2000.
5. Being able to carry out tests on Residual Current Devices in accordance with AS 3760 – 2000.

6. Knowing how to use the relevant testing instruments properly and interpret results for compliance with AS 3760 – 2000.

7. Understanding how the Queensland *Workplace Health and Safety Regulation* applies to electrical equipment and installations at the workplace.

It is the responsibility of the employer or self-employed person to determine that the person who has the task of inspecting, testing and tagging electrical equipment is a competent person, being mindful of the definition outlined in the *Workplace Health and Safety Regulation*.

When a Workplace Health and Safety Inspector visits your workplace and finds that you are allowing a person who is not competent to inspect, test and tag your electrical equipment, they will issue a Prohibition Notice, prohibiting you from continuing this practice.

If an inspector finds that your electrical equipment has not been inspected, tested and tagged, they will issue an Improvement Notice for you to rectify this contravention and may take further actions, as appropriate.

Employers and self-employed people need to keep a record of who has inspected and tested their electrical equipment and how competency for that person was determined. This information can be recorded on the tag or in another form, and may be requested by an Inspector.

For more information, please contact Queensland's Division of Workplace Health and Safety.

Phone: 1300 369 915

Internet: www.dir.qld.gov.au

APPENDIX 5 – Direct Comparison of Option 2 Vs. Option 3

Note: T&T means testing and tagging. RCD means a safety switch. The costs are over a 10 year period and are presented in present value terms. Training and Equip. means the costs associated with undertaking training and purchasing the necessary equipment to undertake inspection, testing and tagging.

OPTION 2

Plant Nursery

(a.)	Cost including travel (over 10 Years)				
	Cost of RCDs	Cost T&T	Accessible	Remote	Very Remote
Testing & Tagging	\$65.00	\$730.00	\$795.00	\$2,715.00	\$4,725.00
Fitting RCDs	\$195.00	\$600.00	\$795.00	\$2,715.00	\$4,595.00

OPTION 3

Plant Nursery

(a.)	Cost including travel (over 10 Years)				
	Cost of RCDs	Cost T&T	Accessible	Remote	Very Remote
Testing & Tagging	\$65.00	\$511.00	\$576.00	\$1,920.00	\$3,327.00
Fitting RCDs	\$195.00	\$420.00	\$615.00	\$1,959.00	\$3,275.00

		(b.)				(b.)		
		Cost including travel (over 10 Years)						
(b.)		Train- ing & Equip.	Cost of RCDs	Cost T&T	Accessi- ble	Remote	Very Remote	Cost (over 10 Yrs)
Test- ing & Tag- ging	\$1,054. 67	\$65.00	\$219.00	\$1,338. 67	\$1,914. 67	\$2,298. 67	Testing & Tagging	\$1,119. 67
Fit- ting RCDs	\$1,054. 67	\$195.00	\$180.00	\$1,429. 67	\$2,005. 67	\$2,389. 67	Fitting RCDs	\$1,249. 67

OPTION 2

Flower Nursery

OPTION 3

Flower Nursery

		(a.)				(a.)					
		Cost including travel (over 10 Years)				Cost including travel (over 10 Years)					
(a.)		Cost of RCDs	Cost T&T	Accessi- ble	Remote	Very Remote	Cost of RCDs	Cost T&T	Accessi- ble	Remote	Very Remote
Test- ing & Tag- ging	Testing & Tagging	\$65.00	\$800.00	\$865.00	\$2,785. 00	\$4,865. 00	\$65.00	\$560.00	\$625.00	\$1,969. 00	\$3,425.00

Fitting RCDs	\$455.00	\$600.00	\$1,055.00	\$2,975.00	\$4,855.00	Fitting RCDs	\$455.00	\$420.00	\$875.00	\$2,219.00	\$3,535.00
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(b.)		Cost including travel (over 10 Years)				(b.)		Cost (over 10 Yrs)	
	Train- ing & Equip.	Cost of RCDs	Cost T&T	Accessi- ble	Remote	Very Remote			
Test- ing & Tag- ging	\$1,054.67	\$65.00	\$240.00	\$1,359.67	\$1,935.67	\$2,319.67	Test- ing & Tag- ging	Testing & Tagging	\$1,119.67
Fit- ting RCDs	\$1,054.67	\$455.00	\$180.00	\$1,689.67	\$2,265.67	\$2,649.67	Fit- ting RCDs	Fitting RCDs	\$1,509.67

Fruit Farm

		Cost including travel (over 10 Years)				
(a.)		Cost of RCDs	Cost T&T	Accessible	Remote	Very Remote
	Testing & Tagging	\$130.00	\$490.00	\$620.00	\$1,964.00	\$3,350.00
	Fitting RCDs	\$195.00	\$420.00	\$615.00	\$1,959.00	\$3,275.00

Fruit Farm

		Cost including travel (over 10 Years)				
(a.)		Cost of RCDs	Cost T&T	Accessible	Remote	Very Remote
	Testing & Tagging	\$130.00	\$700.00	\$830.00	\$2,750.00	\$4,730.00
	Fitting RCDs	\$195.00	\$600.00	\$795.00	\$2,715.00	\$4,595.00

OPTION 3

		Cost (over 10 Yrs)
(b.)	Testing & Tagging	\$1,184.67
	Testing & Tagging	\$1,184.67

OPTION 2

		Cost including travel (over 10 Years)					
(b.)		Train- ing & Equip.	Cost of RCDs	Cost T&T	Accessible	Remote	Very Remote
	Testing & Tagging	\$1,054.67	\$130.00	\$210.00	\$1,394.67	\$1,970.67	\$2,354.67

Fitting RCDs	\$1,054. 67	\$195.00	\$180.00	\$1,429. 67	\$2,005. 67	\$2,389. 67	Fitting RCDs	\$1,249. 67
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Winery (grape grower)

Winery (grape grower)

(a.)	Cost including travel (over 10 Years)				(a.)	Cost including travel (over 10 Years)					
	Cost of RCDs	Cost T&T	Accessible	Remote		Very Remote	Cost of RCDs	Cost T&T	Accessible	Remote	Very Remote
Testing & Tagging	\$130.00	\$700.00	\$830.00	\$2,750. 00	\$4,730. 00	Testing & Tagging	\$130.00	\$490.00	\$620.00	\$1,964.00	\$3,350. 00
Fitting RCDs	\$260.00	\$600.00	\$860.00	\$2,780. 00	\$4,660. 00	Fitting RCDs	\$260.00	\$420.00	\$680.00	\$2,024.00	\$3,340. 00

(b.)		Cost including travel (over 10 Years)				(b.)	
Testing & Tagging Equip.	Training & Tagging Equip.	Cost of RCDs	Cost T&T	Accessible	Remote	Very Remote	Cost (over 10 Yrs)
Testing & Tagging	\$1,054. ⁶⁷	\$130.00	\$210.00	\$1,394. ⁶⁷	\$1,970. ⁶⁷	\$2,354. ⁶⁷	\$1,184. ⁶⁷
Fitting RCDs	\$1,054. ⁶⁷	\$260.00	\$180.00	\$1,494. ⁶⁷	\$2,070. ⁶⁷	\$2,454. ⁶⁷	\$1,314. ⁶⁷
		Testing & Tagging	Testing & Tagging				
		Fitting RCDs	Fitting RCDs				

OPTION 2

Pig-gery

(a.)		Cost including travel (over 10 Years)				
Testing & Tagging	Fitting RCDs	Cost of RCDs	Cost T&T	Accessible	Remote	Very Remote
Testing & Tagging		\$130.00	\$2,000. ⁰⁰	\$2,130.00	\$4,050. ⁰⁰	\$7,330. ⁰⁰
Fitting RCDs		\$2,860. ⁰⁰	\$600.00	\$3,460.00	\$5,380. ⁰⁰	\$7,260. ⁰⁰
		Testing & Tagging	Testing & Tagging			
		Fitting RCDs	Fitting RCDs			

OPTION 3

Pig-gery

(a.)		Cost including travel (over 10 Years)				
Testing & Tagging	Fitting RCDs	Cost of RCDs	Cost T&T	Accessible	Remote	Very Remote
Testing & Tagging		\$130.00	\$1,400. ⁰⁰	\$1,530. ⁰⁰	\$2,874. ⁰⁰	\$5,170.00
Fitting RCDs		\$2,860. ⁰⁰	\$420.00	\$3,280. ⁰⁰	\$4,624. ⁰⁰	\$5,940.00
		Testing & Tagging	Testing & Tagging			
		Fitting RCDs	Fitting RCDs			

(b.)		Cost including travel (over 10 Years)					Cost (over 10 Yrs)
		Training & Equip.	Cost of RCDs	Cost T&T	Accessible	Remote	
Testing & Tagging	\$1,054. 67	\$130.00	\$600.00	\$1,784. 67	\$2,360. 67	\$2,744. 67	Testing & Tagging \$1,184. 67
Fitting RCDs	\$1,054. 67	\$2,860. 00	\$180.00	\$4,094. 67	\$4,670. 67	\$5,054. 67	Fitting RCDs \$3,914. 67

Meat Chicken Farm

Meat Chicken Farm

(a.)		Cost including travel (over 10 Years)					Cost including travel (over 10 Years)					
		Testing & Tagging	Cost of RCDs	Cost T&T	Accessible	Remote	Very Remote	Cost of RCDs	Cost T&T	Accessible	Remote	Very Remote
Testing & Tagging			\$130.00	\$1,400. 00	\$1,530. 00	\$3,450. 00	\$6,130. 00	Testing & Tagging \$130.00	\$980.00	\$1,110. 00	\$2,454. 00	\$4,330.00

Fitting RCDs	\$650.00	\$600.00	\$1,250.00	\$3,170.00	\$5,050.00	Fitting RCDs	\$650.00	\$420.00	\$1,070.00	\$2,414.00	\$3,730.00
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OPTION 2

OPTION 3

(b.)

(b.)

	Cost including travel (over 10 Years)				Cost (over 10 Yrs)				
	Training & Equip.	Cost of RCDs	Cost T&T	Accessible		Remote	Very Remote		
Testing & Tagging	\$1,054. ⁶⁷	\$130.00	\$420.00	\$1,604. ⁶⁷	\$2,180. ⁶⁷	\$2,564. ⁶⁷	Testing & Tagging		\$1,184. ⁶⁷
Fitting RCDs	\$1,054. ⁶⁷	\$650.00	\$180.00	\$1,884. ⁶⁷	\$2,460. ⁶⁷	\$2,844. ⁶⁷	Fitting RCDs		\$1,704. ⁶⁷

Beef Farm

(a.)		Cost including travel (over 10 Years)				Cost including travel (over 10 Years)					
		Cost of RCDs	Cost T&T	Accessible	Remote	Very Remote	Cost of RCDs	Cost T&T	Accessible	Remote	Very Remote
Testing & Tagging	Testing & Tagging	\$130.00	\$650.00	\$780.00	\$2,700.00	\$4,630.00	\$130.00	\$455.00	\$585.00	\$1,929.00	\$3,280.00
Fitting RCDs	Fitting RCDs	\$260.00	\$600.00	\$860.00	\$2,780.00	\$4,660.00	\$260.00	\$420.00	\$680.00	\$2,024.00	\$3,340.00

(b.)		Cost including travel (over 10 Years)				Cost (over 10 Yrs)			
		Training & Equip.	Cost of RCDs	Cost T&T	Accessible	Remote	Very Remote	Testing & Tagging	Fitting RCDs
Testing & Tagging	Testing & Tagging	\$1,054. ⁶⁷	\$130.00	\$195.00	\$1,379. ⁶⁷	\$1,955. ⁶⁷	\$2,339. ⁶⁷	Testing & Tagging	\$1,184. ⁶⁷
Fitting RCDs	Fitting RCDs	\$1,054. ⁶⁷	\$260.00	\$180.00	\$1,494. ⁶⁷	\$2,070. ⁶⁷	\$2,454. ⁶⁷	Fitting RCDs	\$1,314. ⁶⁷

OPTION 2

Beef Feed-lot

		Cost including travel (over 10 Years)			
		Cost of RCDs	Cost T&T	Accessible	Remote
Testing & Tagging	Testing & Tagging	\$260.00	\$600.00	\$860.00	\$4,660.00
Fitting RCDs	Fitting RCDs	\$325.00	\$600.00	\$925.00	\$4,725.00

(a.)

OPTION 3

Beef Feed-lot

		Cost including travel (over 10 Years)			
		Cost of RCDs	Cost T&T	Accessible	Remote
Testing & Tagging	Testing & Tagging	\$260.00	\$420.00	\$680.00	\$3,340.00
Fitting RCDs	Fitting RCDs	\$325.00	\$420.00	\$745.00	\$3,405.00

(b.)

		Cost including travel (over 10 Years)		
		Cost of RCDs	Cost T&T	Accessible
Training & Equip.	Training & Equip.	\$260.00	\$180.00	\$1,494.67
Testing & Tagging	Testing & Tagging			\$2,454.67

(b.)

		Cost (over 10 Yrs)
Testing & Tagging	Testing & Tagging	\$1,314.67

Fitting RCDs	\$1,054. 67	\$325.00	\$180.00	\$1,559. 67	\$2,135. 67	\$2,519. 67	Fitting RCDs	\$1,379. 67
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Cotton Farm

Cotton Farm

(a.)	Cost including travel (over 10 Years)				Cost including travel (over 10 Years)					
	Cost of RCDs	Cost T&T	Accessible	Remote	Very Remote	Cost of RCDs	Cost T&T	Accessible	Remote	Very Remote
Testing & Tagging	\$195.00	\$600.00	\$795.00	\$2,715. 00	\$4,595. 00	\$195.00	\$420.00	\$615.00	\$1,959. 00	\$3,275.00
Fitting RCDs	\$195.00	\$600.00	\$795.00	\$2,715. 00	\$4,595. 00	\$195.00	\$420.00	\$615.00	\$1,959. 00	\$3,275.00

(a.)

(a.)

Testing & Tagging

Fitting RCDs

OPTION 2

(b.)	Cost including travel (over 10 Years)					
	Training & Equip.	Cost of RCDs	Cost T&T	Accessible	Remote	Very Remote
Testing & Tagging	\$1,054. ⁶⁷	\$195.00	\$180.00	\$1,429. ⁶⁷	\$2,005. ⁶⁷	\$2,389. ⁶⁷
Fitting RCDs	\$1,054. ⁶⁷	\$195.00	\$180.00	\$1,429. ⁶⁷	\$2,005. ⁶⁷	\$2,389. ⁶⁷

Grain Farm

(a.)	Cost including travel (over 10 Years)					
	Testing & Tagging	Cost of RCDs	Cost T&T	Accessible	Remote	Very Remote
Testing & Tagging		\$130.00	\$600.00	\$730.00	\$2,650. ⁰⁰	\$4,530. ⁰⁰

OPTION 3

(b.)	Cost (over 10 Yrs)	
	Testing & Tagging	Fitting RCDs
Testing & Tagging	\$1,249. ⁶⁷	\$1,249. ⁶⁷
Fitting RCDs	\$1,249. ⁶⁷	\$1,249. ⁶⁷

Grain Farm

(a.)	Cost including travel (over 10 Years)					
	Testing & Tagging	Cost of RCDs	Cost T&T	Accessible	Remote	Very Remote
Testing & Tagging		\$130.00	\$420.00	\$550.00	\$1,894. ⁰⁰	\$3,210.00

Fitting RCDs	\$130.00	\$600.00	\$730.00	\$2,650.00	\$4,530.00	Fitting RCDs	\$130.00	\$420.00	\$550.00	\$1,894.00	\$3,210.00
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(b.)		Cost including travel (over 10 Years)				(b.)		Cost (over 10 Yrs)	
	Train- ing & Equip.	Cost of RCDs	Cost T&T	Accessi- ble	Remote	Very Remote			
Test- ing & Tag- ging	\$1,054.67	\$130.00	\$180.00	\$1,364.67	\$1,940.67	\$2,324.67	Test- ing & Tag- ging	Testing & Tagging	\$1,184.67
Fit- ting RCDs	\$1,054.67	\$130.00	\$180.00	\$1,364.67	\$1,940.67	\$2,324.67	Fit- ting RCDs	Fitting RCDs	\$1,184.67

OPTION 2

Hatchery & Ornamental Growout (Aquaculture)

	Cost including travel (over 10 Years)				
	Cost of RCDs	Cost T&T	Accessi-ble	Remote	Very Remote
Test- ing & Tag- ging	\$65.00	\$2,000. 00	\$2,065. 00	\$3,985. 00	\$7,265. 00
Fit- ting RCDs	\$325.00	\$600.00	\$925.00	\$2,845. 00	\$4,725. 00

(b.)

	Cost including travel (over 10 Years)					
	Train- ing & Equip.	Cost of RCDs	Cost T&T	Accessi-ble	Remote	Very Remote
Test- ing & Tag- ging	\$1,054. 67	\$65.00	\$600.00	\$1,719. 67	\$2,295. 67	\$2,679. 67

OPTION 3

Hatchery & Ornamental Growout (Aquaculture)

(a.)	Cost including travel (over 10 Years)				
	Cost of RCDs	Cost T&T	Accessi-ble	Remote	Very Remote
Test- ing & Tag- ging	\$65.00	\$1,400. 00	\$1,465. 00	\$2,809. 00	\$5,105.00
Fit- ting RCDs	\$325.00	\$420.00	\$745.00	\$2,089. 00	\$3,405.00

(b.)

	Cost (over 10 Yrs)	
	Test- ing & Tag- ging	Test- ing & Tag- ging
	\$1,119. 67	\$1,119. 67

Fitting RCDs	\$1,054. 67	\$325.00	\$180.00	\$1,559. 67	\$2,135. 67	\$2,519. 67	Fitting RCDs	\$1,379. 67
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Grow-out table fish (Aquaculture)

Grow-out table fish (Aquaculture)

(a.)	Cost including travel (over 10 Years)				Cost including travel (over 10 Years)					
	Cost of RCDs	Cost T&T	Accessible	Remote	Very Remote	Cost of RCDs	Cost T&T	Accessible	Remote	Very Remote
Testing & Tagging	\$65.00	\$1,500.00	\$1,565.00	\$3,485.00	\$6,265.00	\$65.00	\$1,050.00	\$1,115.00	\$2,459.00	\$4,405.00
Fitting RCDs	\$130.00	\$600.00	\$730.00	\$2,650.00	\$4,530.00	\$130.00	\$420.00	\$550.00	\$1,894.00	\$3,210.00
						Testing & Tagging				
						Fitting RCDs				

OPTION 3

(b.)

	Cost including travel (over 10 Years)			Cost (over 10 Yrs)
	Accessible	Remote	Very Remote	
Testing & Tagging	\$1,569. 67	\$2,145. 67	\$2,529. 67	\$1,119. 67
Fitting RCDs	\$1,364. 67	\$1,940. 67	\$2,324. 67	\$1,184. 67

OPTION 2

(b.)

	Cost including travel (over 10 Years)			
	Training & Equip.	Cost of RCDs	Cost T&T	Accessible
Testing & Tagging	\$1,054. 67	\$65,00	\$450,00	\$1,569. 67
Fitting RCDs	\$1,054. 67	\$130,00	\$180,00	\$1,364. 67

APPENDIX 6 – Comparison of Jurisdictions

Policy issue	Queensland	New South Wales	Australian Capital Territory	Victoria
General obligations	Employers and self-employed persons may discharge the obligations for exposure to the risk by following the prescribed ways. Provisions do not deal with all circumstances that expose someone to the risk of electric shock from electrical equipment or an electrical installation.	Employer must ensure that all electrical installations, electrical articles and associated equipment at a place of work are safe to use and are regularly inspected, tested and maintained to ensure they remain safe for use and are repaired or replaced if unsafe.	No specific legislative requirements. Reliance on the Occupational Health and safety Act 1989.	No specific legislative requirements.
Protection of cord extension sets and flexible cables	Requires that cords are protected against damage and liquid.	Employer must ensure any electrical cord extension sets, flexible cables or fittings are located where they are not likely to be damaged (including damage by liquids) or are protected against any damage and adequate signs to warn of the hazards, are provided.	No specific legislative requirements. Reliance on the Occupational Health and safety Act 1989.	No specific legislative requirements.

<p>Overhead electric lines</p>	<p>Restricts work within close proximity to overhead electric lines to 2m.</p>	<p>Employer must ensure persons at work, their plant, tools or other equipment and any materials used in or arising from the work do not come into close proximity with overhead electrical power lines (except if the work is done in accordance with a written risk assessment and safe system of work and the requirements of the relevant electricity supply authority).</p> <p>A controller of premises must ensure that persons working in, or undertaking maintenance on, the premises (apart from those undertaking electrical work) are prevented from coming within an unsafe distance from any overhead electrical power lines or live electrical installations unless a risk assessment determines otherwise.</p>	<p>No specific legislative requirements. Reliance on general obligations under the Occupational Health and safety Act 1989.</p>	<p>Employers must ensure plant is operated near overhead electrical power lines in such a way as to ensure the risk to people associated with the operation is eliminated; or if it is not practicable to eliminate the risk, reduced so far as is practicable.</p> <p>A person must not, without the written permission of the Network Operator, fly, launch or release any kite, aeroplane, glider, balloon, parachute, model aeroplane or model glider, so that it will, in the course of its intended flight, or in any circumstances which could reasonably be predicted or anticipated, come within 45 metres of any overhead electric line or other exposed electrical equipment of a Network Operator.</p>
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<p>Overhead electric lines (continued)</p>				<p>A person who transports anything in the vicinity of a Network Operator's electric line or overhead assets must ensure that at all times during the transportation the distance between the load transported and the Network Operator's electric lines and overhead assets exceeds the minimum distances prescribed.</p> <p>A person must not operate a crane, backhoe, post hole digger, excavator or other machine or vehicle equipped with an elevating component or shear legs or water borne vessel so that any part of the vehicle or vessel or its load comes within the distances (listed) of any point to which a part of an electric line, service line or other cable system may swing or sag.</p>
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<p>Inspection, testing and tagging of equipment</p>	<p>Requirements dependent on class of work being performed. Intervals similar to that contained in AS 3760.</p>	<p>An employer must ensure electrical articles and associated equipment at a place of work are regularly inspected, tested and maintained. Employers must also ensure that a record is made and kept of all inspections and tests made and maintenance carried out on electrical articles and electrical installations required</p>	<p>No specific legislative requirements. Reliance on general obligations under the Occupational Health and safety Act 1989.</p>	<p>Inspection and test procedures should be followed for the routine in-service and testing of electric tools, including flexible cords, cord extension sets and portable outlet devices, as described in AS/NZS 3760.</p>
<p>Use of safety switches</p>	<p>Employer or self-employed person must ensure that specified electrical equipment is connected to a type 1 or 2 RCD or a portable type 1 or 2 RCD.</p>	<p>No specific legislative requirements</p>	<p>No specific legislative requirements. Reliance on general obligations under the Occupational Health and safety Act 1989.</p>	<p>All portable electrical tools, appliances and equipment should be supplied through a residual current device (RCD) providing personnel protection, Type II (30 mA) or Type I (10 mA) complying with AS 3190, or supplied through an isolating transformer complying with AS/NZS 3108. If portable RCDs are used they should be utilised as close as practicable to the point of supply, e.g. at the supply end of an extension lead and not at the appliance end.</p>

Periodical testing of safety switches	Must be tested using its inbuilt test button immediately after it is connected and at least every three months. Must be tested by a competent person at least every 2 years.	No specific legislative requirements	No specific legislative requirements. Reliance on general obligations under the Occupational Health and safety Act 1989.	Inspection and test procedures should be followed for the routine in-service and testing of RCDs and portable isolation transformers, as described in AS/NZS 3760.
Double adaptors and piggyback plugs	Use of double adaptors prohibited	No specific legislative requirements	No specific legislative requirements. Reliance on general obligations under the Occupational Health and safety Act 1989.	No specific legislative requirements
Policy issue	Tasmania	South Australia	Western Australia	Northern Territory
General obligations	An accountable person who causes the erection, installation or commissioning of any plant must ensure that any electrical installation associated with that plant complies with AS 3000.	Any electrical installation, materials, equipment or apparatus within a workplace must be so designed, constructed, installed, protected, maintained and tested as to minimise the risk of electrical shock or fire.	Employers, main contractors, self-employed persons and persons having control of the workplace must ensure that all electrical installations at the workplace are designed, constructed, installed, protected, maintained and tested so as to minimise the risk of electrical shock or fire.	Electrical installations, materials, equipment and apparatus at a workplace shall be protected and maintained to minimize the risk of electrical shock or fire.
Protection of cord extension sets and flexible cables	No specific legislative requirements.	No specific legislative requirements.	No specific legislative requirements.	No specific legislative requirements.

Overhead electric lines	No specific legislative requirement	Restricts work within proximity to overhead electric lines. No specific distance prescribed.	Restricts work within close proximity to overhead lines to outside the "danger zone". Danger zone area varies depending on voltage of electric line	<p>A worker shall not perform work; or cause, permit or employ a worker to perform work, in proximity to exposed live electrical equipment or apparatus unless the supply of electricity to the equipment or apparatus is disconnected; or if compliance is not practicable, barriers are put in place that will prevent the worker coming into contact with the equipment or apparatus.</p> <p>Where it is not practicable to comply, work referred to may be performed if a safe system of work is used when the work is performed.</p>
Inspection, testing and tagging of equipment	No specific legislative requirements.	No specific legislative requirements.	Tester of electrical equipment at construction sites must inspect test and tag as per AS/NZS 3012.	No specific legislative requirements.

<p>Use of safety switches</p>	<p>Socket-outlets with a rating not exceeding 20 A, installed in locations other than those referenced in Clauses 2.5.3.1 and 2.5.3.2, and intended to be used for the connection of electrical equipment that may represent an increased risk of electric shock to the user, shall be protected by RCDs with a maximum rated residual current of 30 mA.</p>	<p>Supply of electricity must be protected by a portable or non-portable RCD.</p>	<p>RCDs must be installed either at the switchboard or at the socket outlet. Signage must be supplied to indicate where the RCD is installed.</p>	<p>The socket outlet final sub-circuit shall be protected by a residual current device permanently installed in the switchboard at which the circuit originates or in a socket outlet located on the circuit so that the equipment is protected; or the equipment shall be protected by a portable residual current device connected directly to the socket outlet.</p>
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Periodical testing of safety switches	No specific legislative requirement	RCDs must be kept in a safe operating condition and tested on a regular basis by a competent person. For non-portable RCDs the inbuilt test button must be tested every three months. For portable RCDs the inbuilt test facility must be tested in accordance with AS3760. AS3760 prescribes testing intervals of the inbuilt testing facility to be performed daily or before every use for non-portable RCDs and every 6 months for non-portable RCDs. AS3760 prescribes RCDs to be tested by a competent person every 12 months for both portable and non-portable RCDs.	Must ensure that non-portable RCDs are kept in a safe working order and tested on a regular basis. No specific time frames are prescribed.	A residual current device installed at a workplace shall be kept in a safe working condition and tested on a regular basis by a competent person to ensure its continued effective operation. The owner of a residual current device tested shall keep a record of the test while the device remains in operation at the workplace.	Double adaptors and piggyback plugs	No specific legislative requirement	No specific legislative requirement.	No specific legislative requirement.	No specific legislative requirement.
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ENDNOTES

1. Laid before the Legislative Assembly on . . .
2. The administering agency is the Department of Industrial Relations.