Review of Queensland's *Electrical Safety Act 2002*

Report – December 2021

7 December 2021

The Hon Grace Grace MP
Minister for Education
Minister for Industrial Relations
Minister for Racing
1 William Street
BRISBANE QLD 4000

Dear Minister

I am pleased to present you with the report, Review of Queensland's *Electrical Safety Act 2002*.

I am grateful to the members of the Industry Reference Group, all stakeholders who contributed to this Review and to the officers of your Department who provided secretariat support to me during this process.

Thank you for the opportunity to play an important role in what has been a collaborative effort to ensure Queensland's electrical safety framework keeps pace with technological change and is further enhanced considering experience and evidence since the Act commenced almost 20 years ago.

Yours sincerely

R.L. Williams
Reviewer

Contents

Glossary

Ai Group	Australian Industry Group
AIHS	Australian Institute of Health and Safety
CCWRFSI	Consultative Committee for Work Related Fatalities and Serious Incidents
CPD	Continuing Professional Development
DEE	Dangerous Electrical Event
DESBT	Department of Employment, Small Business and Training
ELC	Electrical Licencing Committee
ELV	Extra Low Voltage
ERAC	Electrical Regulatory Authorities Council
ESB	Electrical Safety Board
ESO	Electrical Safety Office
ESQ	Energy Skills Queensland
ESV	Energy Safe Victoria
ETU	Electrical Trades Union
GOC	Government Owned Corporation
HSR	Health and Safety Representative
IRG	Industry Reference Group
ISSC	Industry Sector Standing Committee
MEA	Master Electricians Australia
NECA	National Electrical and Communications Association
NFIA	National Fire Industry Association
OIR	Office of Industrial Relations
OWHSP	Office of the Work Health and Safety Prosecutor
PIA	Preliminary Impact Assessment
QBCC	Queensland Building and Construction Commission
QBP	Qualified Business Person
QFF	Queensland Farmers' Federation
QTP	Qualified Technical Person
RIS	Regulatory Impact Statement

RSHQ	Resources Safety and Health Queensland
SEI	Serious Electrical Incident
SLM	Senior Leaders' Meetings
WHS	Work Health and Safety
WHSB	Work Health and Safety Board
WHSO	Work Health and Safety Officer
WG	Working Group

Executive Summary

This review of the *Electrical Safety Act 2002* (Qld) (**the Act**) is based on the common ground that electrical safety is highly important to the community, including individual homeowners and renters, the generators, transmitters and suppliers of electricity, businesses in general, consumers, and specialist electrical workers. Based on in-depth community consultation and consideration of key issues, recommendations made by the review are set out briefly in this executive summary. Details, including the nature of the issue being considered, specific stakeholders views, rationale and recommendation specifics can be found in Chapters 6-10 of this report. Chapters 1-5 set out various background matters and the conduct of the Review.

Technological change and ensuring the ongoing relevance of key definitions, purpose and powers under the Act (Chapter 6)

The Review has concluded that to remain current in the context of technological change, some of the Act's key definitions require amendment to encompass emerging and future technologies that present electrical safety risks, providing some degree of future proofing that is technologically neutral. This has been the core purpose of the Review. Noting that the regulatory scope of the Act is based on what does and does not fall within the definition of "electrical equipment", the Review has recommended:

- *with respect to specific emerging technologies*, as a starting point, including solar and batteries within the definition of "electrical equipment", and
- *with respect to providing the possibility of technologically neutral futureproofing*, considering categories of exception to the extra low voltage threshold for "electrical equipment" to reflect risk to life and property.

To flexibly respond to changes that present risks to life and property, the Review has also recommended ensuring the purpose of the Act and regulator's powers to make subordinate legislation are broad enough to enable regulations to be made as new technologies arise.

On the topic of technological change, the Review has also considered the emergence of electric vehicles. The purpose of the Act is to avoid loss or damage to life and property caused by electricity, and electric vehicles are no special exception to that important objective. On this matter, I have therefore recommended consideration of including electric vehicles in the scope of regulation by the Act, while engaging with other

regulators to ensure no regulatory duplication or gaps. Exploratory recommendations are also made in respect of hydrogen and extra low voltage equipment.

For the details of these recommendations concerning technological change, purpose, powers, and definitions, refer to Chapter 6 of this report.

Complex relationships and the ongoing relevance of electrical safety duties

While the foundational definition of "electrical equipment" largely defines the scope of the Act's application, the duties that pertain to "electrical equipment" have also been considered in some detail by the Review. The main outcome of these considerations is awareness of gaps in supply chain duties that can be filled to ensure greater accountability for electrical safety. This includes enhanced duties on importers and suppliers of electrical equipment to ensure equipment is safe prior to sale. The scope of the term "importer" has also been raised as in need of clarification.

Regarding duties of electrical contractors, the Review has paid particular attention to the role of "Qualified Technical Persons" (**QTPs**). QTPs play an important role in electrical business, but curiously the legislation is silent on the duties held by QTPs. This does not align either with practice or the Regulator's expectations. The Review has therefore recommended setting out the responsibilities of QTPs explicitly in legislation, as well as consideration of introducing a requirement that all businesses that employ (non-contract) electrical workers must also directly employ a QTP.

These recommendations are to be found in Chapter 7.

Ongoing challenge of alignment with work health and safety legislation

Regarding alignment between Queensland's work health and safety (**WHS**) legislation and electrical safety legislation, the Review has recommended making the status of codes of practice consistent under both frameworks, including specialist health and safety representatives and officers in the electrical safety legislation, and adopting the WHS legislation's duty to consult with other duty holders within the electrical safety legislation. Further details can be found in Chapter 8.

Enhancing Queensland's electrical safety framework

While the licensing functions are not central to the Review's terms of reference, they have been considered as an ancillary matter. Ultimately, the Review has decided to make significant recommendations concerning licence testing requirements, testing administration, continuing professional development requirements, and license renewal assessment.

Beyond competence, the Review has also considered compliance with legislative requirements and is therefore recommending an expanded auditing focus, including in rural areas. The Review has considered it desirable for the Commissioner for Electrical Safety to take an expanded role both in the competence and compliance functions that the Review has recommended expanding.

The specifics of competence and compliance-oriented recommendations are found in Chapter 9.

Specific regulatory reform proposals raised with the Review

Finally, Chapter 10 covers specific regulatory changes aimed at enhanced electrical safety. The key matters included in the recommendations of the Review concern:

- enhanced mandatory safety switch requirements
- requirements for safe work near energised equipment
- requirements for safe work in roof spaces
- property inspections and certificates at specific intervals
- consultation requirements when building near electricity infrastructure, and
- record keeping requirements at the sale of specific electrical equipment.

Many minor recommendations have been made in relation to the Regulations, including on the topics of electric lines, electrical installations, in-scope electrical equipment ,unsafe electrical equipment, electricity entities, incidents and reporting, and miscellaneous and administrative matters. These predominantly minor recommendations are made largely at the behest of the Electrical Safety Office, based on experience implementing the legislation over two decades.

Chapter 1: Overview of the Report

This report is divided into 11 chapters. The present chapter (**Chapter 1**) provides an overview of the contents of the report.

Background and conduct of the Review

Chapter 2 sets out the background of the Review, including its establishment following the 2020 report of the Electrical Safety Commissioner, *Improving Electrical Safety in Queensland,* its terms of reference, guiding principles agreed with the key steering group, and the broad approach to conducting the review.

Chapter 3 sets out in more detail project planning for the Review, deliverables and milestones, governance, resourcing and support, and the proposed consultation approach.

Chapter 4 sets out stakeholder consultation conducted by the Review in some detail. The chapter covers establishing an Industry Reference Group made up of key stakeholders to guide the review, the release of a public issues paper and receiving written submissions from stakeholders in response. Industry Reference Group meetings are summarised, along with meetings of working groups established thereunder. Finally, one-on-one consultation meetings with key stakeholders are listed.

Chapter 5 sets out the scope of the Review and key issues considered by it, including technological change and future proofing, the continued relevance and effectiveness of key definitions, electrical duties and requirements, alignment with work health and safety legislation, enhancing competence and compliance, as well as specific regulatory issues.

Issues, input, recommendations

Chapters 6 to 10 cover the substance of the Review, with each term of reference, key issue thereunder, relevant stakeholder views, reasoning and recommendations traversed in turn.

Chapter 6 covers the topic of ensuring effective definitions and future proofing. This includes the Act's core definition that establish the scope of what and who is subject to electrical safety duties, requirements, regulations, etc. Separately, core definitions also include "incident definitions", or the kinds of events that necessitate communication with the regulator. Finally, other definitions and the Act's general powers and purposes are considered in this chapter.

Chapter 7 covers the topic of ensuring effective electrical safety duties. Duties are placed on various people to ensure electrical safety for the purpose of preventing harm. The clarity and sufficiency of these duties, and the frameworks that surround them, are considered in this chapter.

Chapter 8 covers the alignment of the Act WHS legislation, with a particular focus on the status of codes of practice, and the role of health and safety representatives and officers.

Chapter 9 is the first of two chapters dedicated to the broad term of reference on enhancing electrical safety. This first chapter focuses on electrical workers, particularly ensuring their competence through licensing, testing and continuing professional development, and compliance with laws and regulations about electrical work. Significant licencing reform recommendations are discussed in this chapter.

Chapter 10 continues with the theme of enhancing electrical safety, with a focus on specific regulatory issues. These are various but significant areas for regulatory reform, including safety switch requirements, working near energised equipment, working in roof spaces, electrical safety property inspections and certificates, consulting with electricity entities when building near public infrastructure, record keeping at the point of sale of specific electrical equipment, as well as other regulatory issues raised by Review stakeholders. This chapter concludes the substantive portion of the Review report.

Conclusion

Chapter 11 provides concluding remarks.

Chapter 2: Review Background

2.1 Establishment of the *Electrical Safety Act 2002* review

Queensland's current electrical safety laws were last reviewed in 2002 when the *Electrical Safety Act 2002* (Qld) (**the Act**) was introduced. Since this time, the technological landscape has changed significantly, with electricity generation, supply and distribution transforming in ways not contemplated 20 years ago.

On 25 June 2019, the Queensland Minister for Education, Minister for Industrial Relations and Minister for Racing, the Honourable Grace Grace MP (**the Minister**), announced that the Electrical Safety Commissioner, Mr Greg Skyring (**the Commissioner**), would convene a roundtable to discuss safety in large-scale solar farms. This followed a judicial decision finding that regulations about safety on solar farms did not fall within the powers granted under the Act.

As part of this announcement the Minister noted that the judicial *"decision clearly highlighted that Queensland's electrical safety laws had not kept pace with new and emerging technologies, including large-scale solar farms".*

In January 2020, the Commissioner drew on the outcomes of an extensive stakeholder roundtable process, as well as broader experience, to deliver findings and recommendations to the Minister in the form of *Improving Electrical Safety in Queensland: A Report by the Commissioner for Electrical Safety* (**the Commissioner's report**).

The first recommendation of the Commissioner's report was that the Queensland Government should undertake a review of the Act, including *"the objects of the Act and regulation-making powers, to ensure it is fit for purpose and can keep pace with new and emerging technologies".*

In August 2020, the Minister announced a review of the Act, being the 2021 *Review of Queensland's Electrical Safety Act 2002* (**the Review**), be undertaken by an external independent Reviewer with the support of a departmental secretariat within the Office of Industrial Relations (**OIR**).

2.2 Terms of Reference

The purpose of the Review of the Act is to consider what legislative changes are necessary to ensure Queensland's electrical safety laws are fit-for-purpose, specifically in relation to new and emerging technologies, and to recommend those changes to the Minister for consideration by Government.

Naturally, the Minister is not bound to accept the recommendations of the Reviewer, and analysis of the legal and policy implications of the Reviewer's recommendations will be the responsibility of OIR. The implementation of any recommendations will ultimately be subject to the Government's regulatory impact assessment and decision-making processes.

The Review focuses on the Act, including its objects and regulation-making powers, as well as any necessary related changes to subordinate legislation, in the form of the *Electrical Safety Regulation 2013* (**the Regulations**).

Specifically, Terms of Reference for the Review require consideration of:

- all definitions under the Act to ensure relevance and effectiveness.
- all duties and requirements under the Act and Regulations, including on suppliers and generating entities, to ensure relevance and effectiveness.
- how the Act can be future proofed for other emerging energy technologies, including renewable energy generation and storage devices.
- aligning the provisions of the Act with Queensland's work health and safety legislative scheme under the *Work Health and Safety Act 2011* (Qld) (**WHS Act**).
- how any recommendations resulting from the Review will create public value by enhancing Queensland's electrical safety framework (increasing the net benefit to the community through evidence based legislative and/or regulatory change).

2.3 Guiding principles

In order to both inform stakeholder and orient the Review processes that have resulted in this report and its recommendations, a number of guiding principles were drafted by the Reviewer, early in the review process:

- The best outcome be achieved for safety in the industry, for those who work in it as well as consumers and the general public.
- Legislation designed to eliminate risks at the source.
- Legislation drafted in plain English for readability, comprehension and usability by anyone.
- Duties, responsibilities and accountability of businesses and workers are clear and achieve the objectives of the Act.
- Ensure the highest common denominator adopted when drafting and aligning legislation, noting the need for sensible and practical outcomes.

In particular, these guiding principles were communicated to the Industry Reference Group established to assist with the Review process.

2.4 Conduct of the Review

The conduct of the Review was oriented to achieving four key deliverables:

- leading consultation on the Review with relevant stakeholders
- advising the Minister of the progress of the Review
- delivering an interim report to the Minister no later than 15 September 2021; and delivering a final report with recommendations to the Minister no later than 7 December 2021.

2.5 Historical background

Queensland's current electrical safety laws were last comprehensively reviewed prior to 2002, when the Act was introduced. A number of reviews and their recommendations led to the creation of the Act.

A. Joint Ministerial Electrical Safety Taskforce (2000-01)

In February 2000 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, investigated and dealt with. The Taskforce reported in April 2001. It recommended standalone electrical safety legislation as a matter of urgency, based on the *Workplace Health and Safety Act 1995* and complementary to other safety legislation.

B. Queensland Ombudsman reviews (1999 onwards)

In addition to the Electrical Safety Taskforce review, the Queensland Ombudsman received a number of complaints about the way in which the former Department of Employment, Training and Industrial Relations (Division of Workplace Health and Safety) and the former Department of Mines and Energy (Electrical Safety Office) investigated 13 electrical fatalities throughout Queensland between 1995 and 1999. The Ombudsman's Workplace Electrocution Project recommended a comprehensive management and strategic review of the Electrical Safety Office, including penalty provisions and the role of the authorised person in the *Electricity Act 1994* and *Electricity Regulation 1994*.

C. Management and Strategic Review (2001)

In response to the recommendations of the Queensland Ombudsman, Mr John Crittall and Mr Ray Dempsey were appointed to conduct a review into the Electrical Safety Office. In July 2001 the comprehensive management and strategic review identified the need for improved performance in the delivery of health and safety services to Queensland. In part, the report recommended that:

- the Government create a separate Electrical Safety Act to regulate safety matters in the electricity industry; the legislation should reflect modern enforcement methods and be consistent with the *Workplace Health and Safety Act 1995*;
- an independent electrical safety regulator be established with the status of a Statutory Officer, under the authority and control of the Minister for Industrial Relations; and
- the existing advisory Electrical Health and Safety Council be replaced by an Electrical Safety Board to make recommendations.

Overall, the drivers for reform focused on creating a high functioning regulatory agency, including the investigation of potential statutory breaches that may have fatal consequences.

Only limited changes have been made to the Act since its commencement, including:

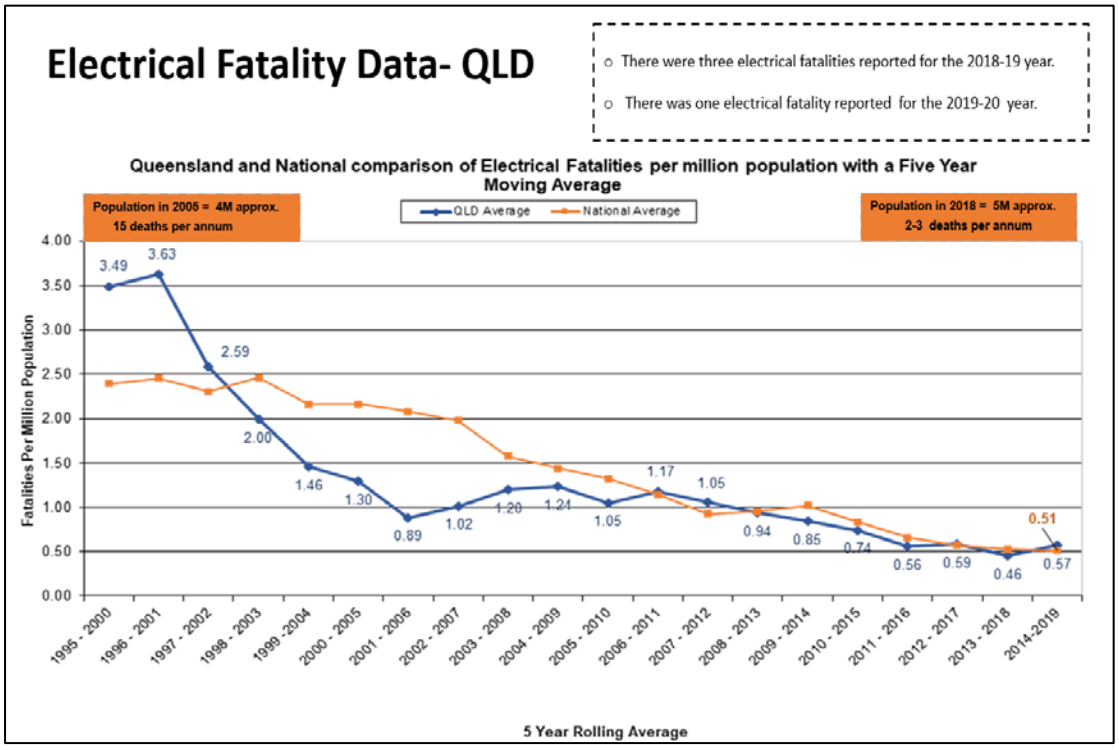
1. amendments from time-to-time (see **Appendix 1**); and

2. the national work health and safety harmonisation process from 2008 that led to the *Work Health and Safety Act 2011*, and consequential amendments to the Act to mirror the provisions of the national model WHS Act in some cases; these provisions commenced on 1 January 2014 (see **Appendix 2**).

2.6 Performance under the *Electrical Safety Act 2002*

The Act has been in force now for almost 20 years. In the broadest sense, the purpose of the Act is establishing a legislative framework for "preventing persons from being killed or injured by electricity" (s 4(2)(a)). Electrical fatality data is presented in Figure 1, below, both for Queensland and the nation. Queensland's average fell dramatically in the years immediately following the commencement of the Act and has lowered further over the past 15 years. In the last five years, the state average is in the vicinity of one fatality every two years per million people. Noting Queensland's population of approximately five million, this equates to between approximately two and three fatalities per year; this is slightly above the national average.

Figure 1: Queensland Electrical Fatality Data



It is important to acknowledge the clear advances made since the turn of the century, while also looking to each fatality that has occurred in this time for information and for guidance on how to improve. In so doing, we might hope to prevent repeat occurrences and thereby honour the lives and the families of those who have tragically left us. Coronial reports and recommendations, as well as additional recommendations made by the Commissioner for Electrical Safety, are particularly useful in this regard and have guided the review in its areas of focus, consideration and ultimately its recommendations. This is

reflected, for example, in some of the specific regulatory issues considered in Chapter 10, including working in roof spaces and safety switch requirements.

There are a number of approaches that can be taken to viewing the performance of the current electrical safety framework in terms of its success at preventing injury. Each with its limitations provide an overview of incidents worthy of consideration and attention. One approach that can be explored is the analysis of serious electrical incident data. This data is limited by its reliance on reporting, this is noted in the review in chapter 6 where the review considered a number of definitions one of which was "serious electrical incident". The dominating view during consultation that the definition lacks clarity is a strong indicator of inaccurate reporting.

Under section 11 of the Act the definition for serious electrical incident (SEI) is:

A serious electrical incident is an incident involving electrical equipment if, in the incident—
(a)a person is killed by electricity; or
(b)a person receives a shock or injury from electricity, and is treated for the shock or injury by or under the supervision of a doctor; or
(c)a person receives a shock or injury from electricity at high voltage, whether or not the person is treated for the shock or injury by or under the supervision of a doctor.

Notifying the Regulator of SEIs and DEEs is one of many PCBU duties under the Electrical safety Legislation. Currently the section 265 of the Regulation requires that:

(1)A person who conducts a business or undertaking must ensure that the regulator is notified, in a way that complies with subsections (2) to (4) and by the fastest means possible, immediately after becoming aware that a serious electrical incident or dangerous electrical event arising out of the conduct of the business or undertaking has occurred.

Maximum penalty—100 penalty units.

(2)The notice must be given—
(a)by telephone; or
(b)in writing.
Example—

The written notice can be given by facsimile, email or other electronic means.

(3)A person giving notice by telephone must—
(a)give the details of the incident or event requested by the regulator; and
(b)if required by the regulator, give a written notice of the incident or event within 48 hours after the requirement is made.

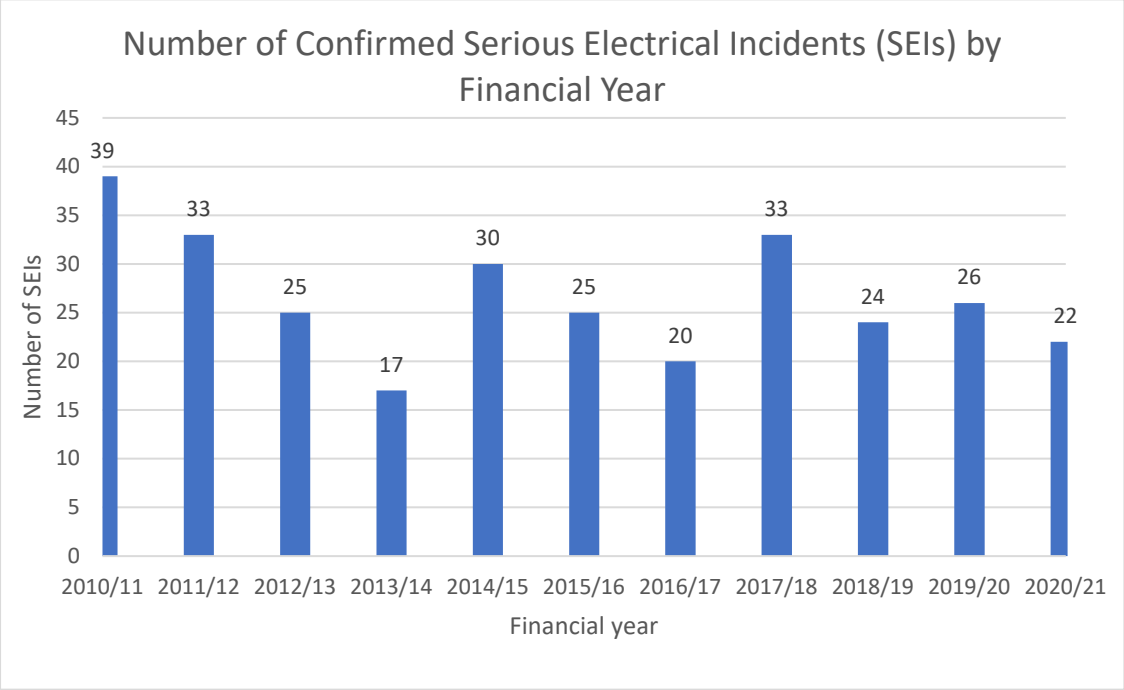
(4)A written notice must be in a form, or contain the details, approved by the regulator.

(5) If the regulator receives a notice by telephone and a written notice is not required, the regulator must give the person conducting the business or undertaking—
(a)details of the information received; or
(b)an acknowledgement of receiving the notice.

(6)A person conducting a business or undertaking must keep a record of each serious electrical incident or dangerous electrical event for at least 5 years after the day that notice of the incident or event is given to the regulator under this section.
Maximum penalty for subsection (6)—50 penalty units.

Serious Electrical Incidents in Queensland are checked by the Regulator upon receipt for consistency with legislative reporting requirements. This process whilst administratively burdensome ensures that SEI data reported by the department is not overinflated due to incorrect reporting. Conversely this only ensures that the data that is reported is accurate and does not provide for unreported serious electrical incidents in Queensland. This is a limitation of this data. Figure 2, below, indicates the number of confirmed SEIs from 2010-2011 financial year to 2020-2021 Financial year.

Figure 2: Serious Electrical Incidents by financial year



The graph shows a peak of 39 confirmed SEIs in 2010/2011. The confirmed SEIs were at their lowest in 2013/2014 at 17. The data overall does not demonstrate a strong downwards trend. Despite the limitations of this data, this data indicates that SEIs are continuing to occur in industry, underpinning the need for a review and reform to achieve zero harm.

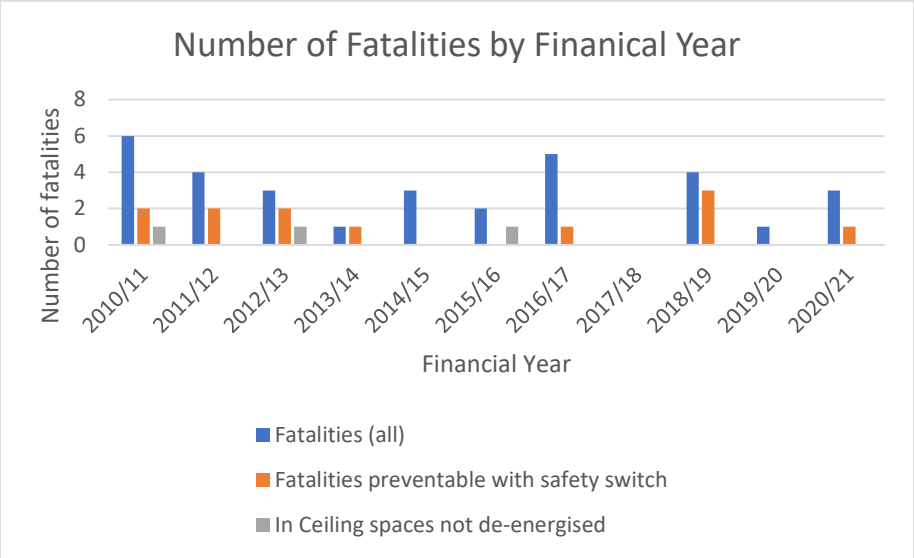
Arguably one of the most important components of serious electrical incidents is fatalities. Central to the purpose of the Act is preventing the loss of life. The impact of fatalities on workplaces, families, friends and communities is immeasurable. As part of this Review, it is important to reflect on the tragic loss of life due to serious electrical incidences under the current legislation to consider reform to prevent further loss of life.

The tragic loss of life due to electrocution was also raised in the Commissioner's report in particularly when speaking to recommendations regarding safety switches and the de-energisation of roof spaces. These were both recommended for consideration in the Act review by the Commissioner due to their links with recent fatalities.

Figure 3, below, plots fatalities included in the SEIs reported above and also indicates which of the fatalities which were in ceiling spaces that were not subject to de-

energisation and those that were identified that would have been preventable with a safety switch.

Figure 3: Electrical safety related fatalities by financial year



This graph is a stark reminder that reform in the electrical safety framework in Queensland is needed. This underpins the recommendations made by coroners, by the Commissioner's report and those made as part of this Review.

A further measure that can be used as an indicator of the performance of the current electrical safety framework in terms of preventing injury is workers' compensation data. Whilst workers' compensation data may share similarities to the incident data, it has significant differences. Firstly, it is important to note that the relevant claims data is classified as "involving contact with electricity" this classification varies considerably from serious electrical incidents. One consequence of this, is that the data includes injuries where the mechanism of injury was a consequence of a reaction to an electric shock, therefore the injuries indirectly caused by electricity are in scope. Further considerations include the accuracy of incident/event reporting when it comes to reportable incident data, and the discrepancies that exist between reportable incidents/events that occur and those where an injury is sustained, and a workers' compensation claim is made and accepted. A visual representation of the commonality of Incident data and Workers' compensation data is included below in Figure 4.

Figure 4: Overlapping data – incidents and workers' compensation

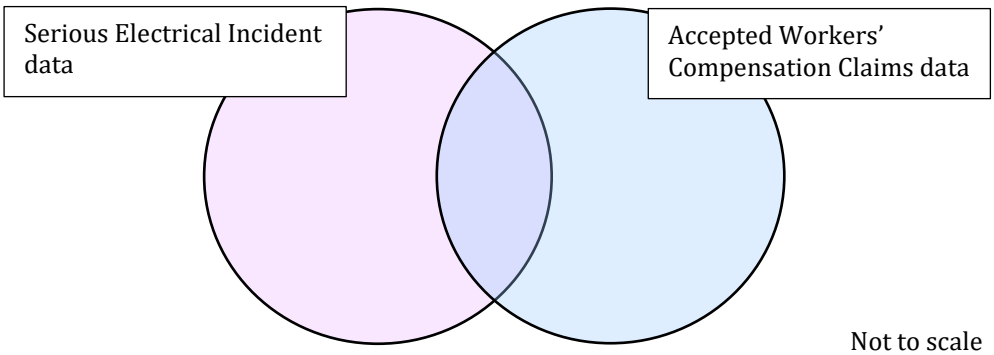
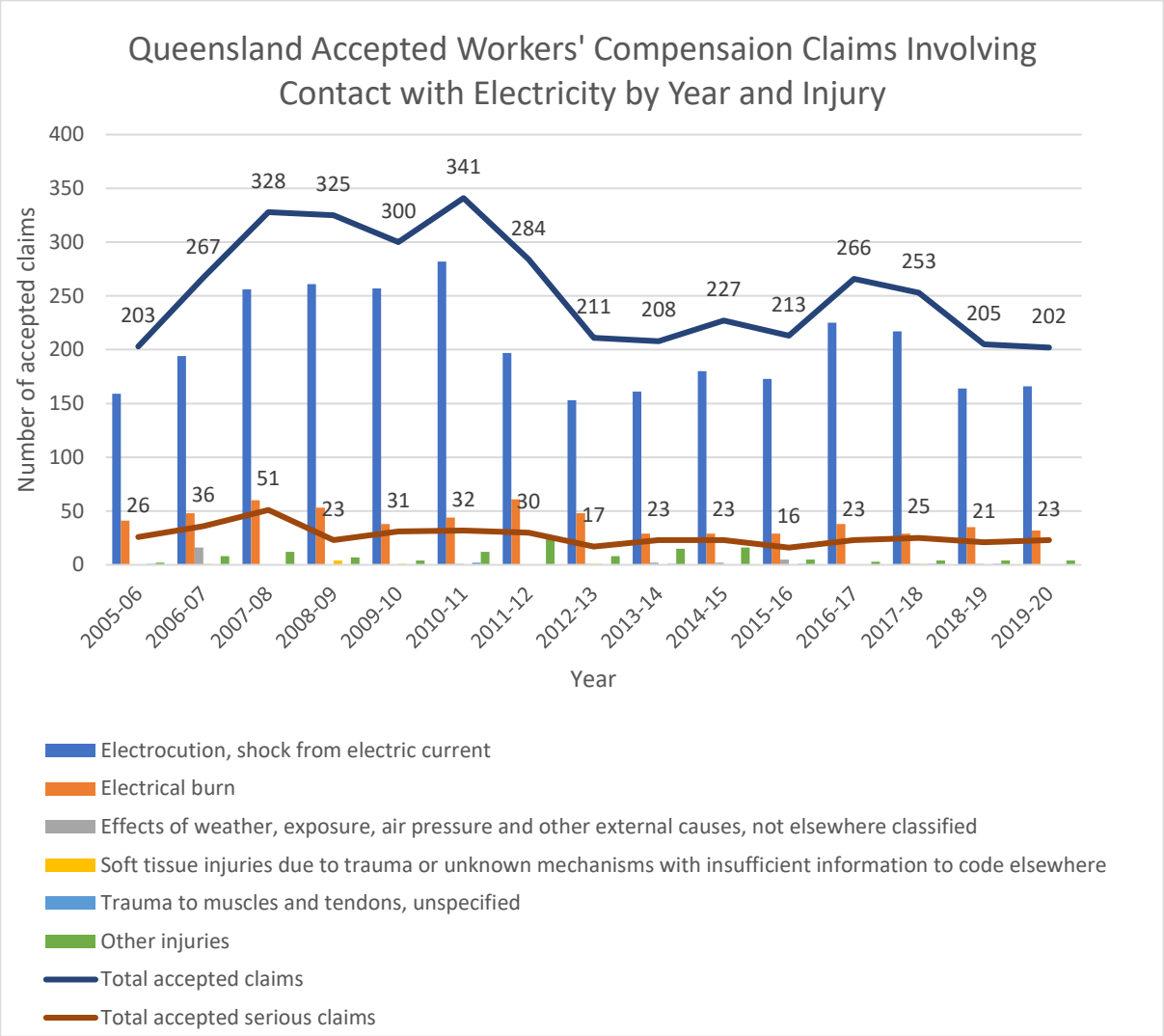


Figure 5, below, provides an overview of accepted workers' compensation claims involving contact with electricity. The two-line graphs provide the yearly total of accepted claims and number of serious incident claims respectively, noting a serious claim involves 5 or more days off of work due to injury. The clustered columns indicate the injuries sustained contributing to annual total.

Figure 5: Accepted workers' compensation claims involving electricity



As you might expect the graph indicates that electrocution or shock from electric current was the most common injury type, this is followed by electrical burn. Both of these injuries are directly caused by electricity. Neither the total number of accepted claims nor the number of serious claims indicate a strong downward trend once again underpinning the need for a review of the Electrical safety legislation and consequential reform.

Under section 88 of the Act one of the functions of the licensing committee is to take necessary disciplinary action against holders of electrical licences and against previous holders of electrical contractor licences. Section 88 instructs that the licensing committee may discharge its functions by taking action to ensure holders of electrical licences

perform work, or conduct their businesses or undertakings to appropriate standards, including by cancelling or suspending licences and taking other disciplinary action.

Further, and notwithstanding overall deceases in electrical fatalities over the years, recent disciplinary hearings conducted by the Electrical Licensing Committee reveals disciplinary hearings continue to remain relatively consistent, noting the 2021 data is pro rata up until 27 October 2021 and therefore not the full year and the reduction in 2020 can be attributed to the COVID-19 pandemic (see Figure 6). This trend speaks to a concerning narrative that there is continuing to be a number of holders of electrical licences who are not performing work or conducting their businesses or undertaking to appropriate standards. This contributes to a compromise in electrical safety and raises concerns about competence.

Figure 6: Electrical Licensing Committee disciplinary hearings

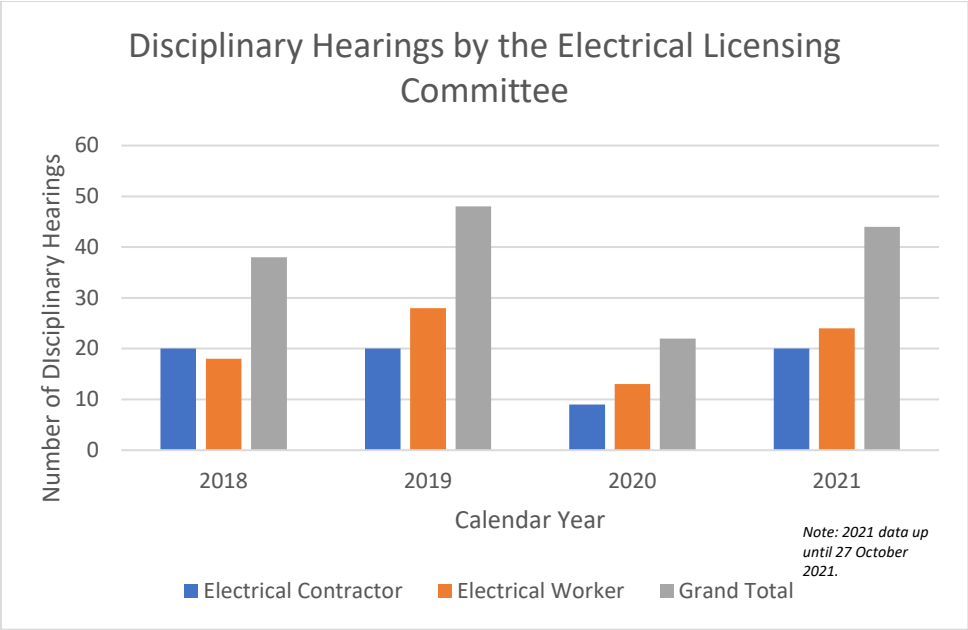
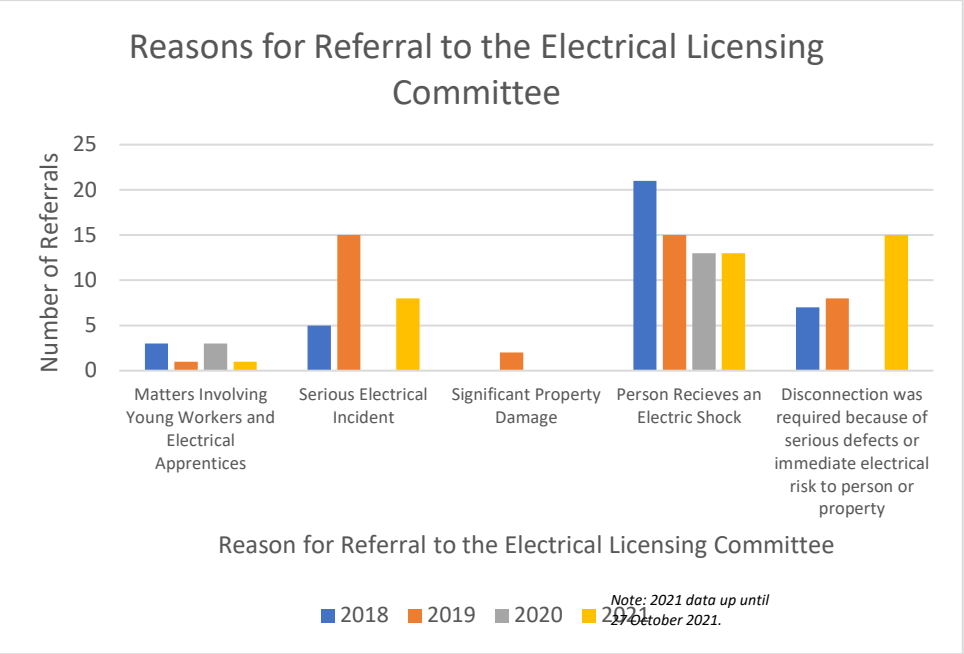


Figure 7, below, details some of reasons that have featured over the past few years for referrals to the electrical licensing committee. Of particular concern is the number of electric shocks. This is a stark reminder that substandard work has safety implications for the community. Furthermore, it is noted that matters affecting young workers and electrical apprentices are occurring annually which raises questions as to the adequacy of competence, and compliance frameworks (considered in chapter 9).

Figure 7: Reasons for referral to the Electrical Licensing Committee



Today, the combination of new technological changes, persistent compliance issues, and preventable fatalities help to point the way towards an enhanced framework for electrical safety in Queensland to improve further on the significant safety advances of the past 20 years.

Before proceeding to these areas for improvement in Chapters 5-10, Chapter 3 of this report sets out in some detail the planning and governance arrangements that supported and oversaw the conduct of the Review, before Chapter 4 sets out Review consultations that confirmed and expanded on the issues considered by the Review.

Chapter 3: Planning and Governance

Detailed project planning commenced in December 2020. Key elements of the project plan are set out in this chapter, including deliverables and milestones (3.1), governance, resourcing and support (3.2) and proposed consultation approach (3.3).

3.1 Deliverables and milestones

The review's milestones are oriented to two core deliverables. Those deliverables, their purposes and timeframes are set out in the table below.

Deliverable	Purpose	Due date
Interim report	To inform the Minister of review progress	15 September 2021
Final report	To provide recommendations to the Minister	7 December 2021

Based on the timeframes for deliverables being in late 2021, project planning focused on a gradual process of working towards completion of these aims from December 2020 onwards, as set out in the table below.

Date	**Action**
December 2020	Minister appoints Reviewer
December 2020	Initial planning meetings between OIR and Reviewer
December 2020	OIR email announcement of Act review to stakeholders
December 2020	OIR to email general invite to reference group members
December 2020	Draft issues paper and issues register provided to Reviewer prior to Christmas/new year break
January 2021	Email first meeting invites to reference group members
January 2021	First meeting of reference group Friday 29/1, including to review of issues paper
March 2021	Publication of issues paper online seeking written submissions by Friday 5/3
18 April 2021	Deadline for written submissions (6-week timeframe)
April – September 2021	Reviewer conducts one-on-one meetings with key stakeholders and regular reference group meetings
June – August 2021	Preparing interim report
15 September 2021	Interim report provided to DDG and Minister
Sep–Nov 2021	Finalisation of final report and recommendations
7 December 2021	Final report provided to the DDG and Minister

As the Review progressed through the initial stages beyond early 2021, the Review team developed a more detailed schematic of milestones and the progress of the Review in the form of a Gantt chart contained in **Appendix 3**.

3.2 Governance, resourcing and support

A. Independent Reviewer

This Review was conducted by me, an independent Reviewer, directly appointed based on extensive experience overseeing important collaborative work involving government and industry. I bring to the role knowledge and understanding of electrical safety and real-world industry experience, including as the State Secretary of the Electrical Trades Union (**ETU**), as a former member of the Electrical Safety Board, and over 40 years' experience in the sector.

It has been my role as Reviewer to consider issues that fall within the scope of the review, collect relevant information via consultation, identify any further issues for consideration in the context of that consultation, prepare and consult on draft recommendations, and ultimately finalise the recommendations and present them in a final report – this report – for the Minister's consideration.

A. Key governance parties

Along with my own role as Reviewer, key governance roles were held as follows.

- *Executive Sponsor:* The Honourable Grace Grace MP, Minister for Education, Minister for Industrial Relations and Minister for Racing
- *Executive Management:* Mr Craig Allen, Deputy Director-General, Office of Industrial Relations, Department of Education
- *Lead Executives:*
    - Ms Donna Heelan (Executive Director, Electrical Safety Office) and
    - Ms Jodie Deakes (Executive Director, WHS Engagement and Policy Services)
- *Commissioner for Electrical Safety:* Mr Gregory Skyring
- *Reviewer:* Mr Dick Williams
- *Policy secretariat and technical support:* Officers from the Work and Electrical Safety Policy Unit and Electrical Safety Office within OIR.

B. OIR resources and support

The Work and Electrical Safety Policy unit (**WESP**) has provided policy, secretariat and research capability to the Reviewer, as well as secretariat support for the Industry Reference Group, working groups, and stakeholder meetings more broadly. WESP officers played an important role in drafting the publicly released issues paper (see 4.2) and sections of this report.

The Electrical Safety Office (**ESO**) has provided funding and significant support on technical matters and reform priorities as needed.

Administrative support, including on financial matters, has been provided by OIR.

C. Senior Leaders' Meetings

Fortnightly meetings of senior leaders have been held since the beginning of the Review. On 21 January 2021, Senior Leaders' Meetings were established to facilitate fortnightly communication between the Reviewer and senior OIR leaders on the progress of the review. "Senior Leaders" consist of Executive Directors of the ESO and Policy areas of OIR, the Reviewer, the Commissioner, and support staff as required.

Senior Leaders' meetings (**SLMs**) enable the Reviewer to update executives and the Commissioner on progress and any challenges being encountered. They are also an opportunity for the Reviewer to make requests for particular information, support or advice. SLMs have served as a vital channel of communication between the Reviewer and OIR. These meetings continue to facilitate conversations regarding resourcing from the policy team and technical areas, the direction of the Review and possible recommendations, in addition to discussions about upcoming meetings, stakeholder meetings and industry reference group (IRG) preparation discussions.

In total, 15 SLMs have been held to date, averaging one every two weeks. Following the first SLM on 21 January 2021, SLMs have been held on the following subsequent dates throughout the review: 8 February, 22 February, 8 March, 22 March, 19 April, 4 May, 17 May, 31 May, 14 June, 15 July, 16 August, 6 September, 13 September, 25 October and 22 November.

3.3 Consultation approach

From the outset, the Review focused on ensuring it was consultative and representative in nature. In line with previous legislative reviews conducted by or with the support of OIR, the following core consultation processes were adopted:

- a limited, high level industry reference group convened to provide Reviewer with sounding board for reform proposals
- an issues paper developed and published online seeking written submissions
- the Reviewer holding one-on-one follow up meetings with key stakeholders as desired.

The implementation of this consultation approach is set out in detail in Chapter 4 of this report.

Chapter 4: Stakeholder Consultation

From the outset, the Review has been informed by extensive engagement with stakeholders to ensure a consultative and representative process. Key aspects of consultation are set out in this chapter, which presents a chronological account of efforts to ensure substantial input from stakeholders into the Review.

Initially, OIR worked to ensure broad communication about the Review to relevant stakeholders, ensuring awareness by all interested parties. This was achieved through the release (and subsequent cascading) of emails to:

- all Work Health and Safety Board and Industry Sector Standing Committee members (4 January 2021)
- the ETU, Master Electricians Australia (MEA), National Electrical and Communications Association (NECA), Queensland Council of Social Services, Clean Energy Council, Smart Energy Council, Office of the Work Health and Safety Prosecutor, and Commissioner for Electrical Safety (4 January 2021)
- the Consultative Committee for work-related fatalities and serious incidents members (5 January 2021).

Initial meetings with core board and committee stakeholder groups began in February 2021, with the Reviewer meeting and providing an initial presentation and "consultation pack" on the Review (consisting of guiding principles, terms of reference, known issues and deliverables) to the:

- Work Health and Safety Board (17 February 2021)
- Electrical Safety Board (18 February 2021), and
- Consultative Committee for work-related fatalities and serious incidents members (22 February 2021).

Following the above, initial meetings, the Review's focus turned to organising a first industry reference group meeting, a public issues paper submissions process, and targeted consultations and Working Group meetings (under the industry reference group) to discuss specific issues. These activities are captured in the below diagram and are explained in detail in the remainder of this chapter.

Industry Reference Group (IRG) Meetings			Key Consultation Milestones
IRG Meeting 1 (29 Jan)	TORs & Principles	Jan	
IRG Meeting 2 (22 Feb)	Issues paper	Feb	
IRG Meeting 3 (22 Mar)	Issue list & insights	Mar	Issues paper published (5 March)
IRG Meeting 4 (19 Apr)	Key issues, future proofing and working group nominations	Apr	Public submissions close (18 April)
IRG Working Groups	• 18 May– Manufacturing 1 • 1 June- WHS 1 • 11 June -Manufacturing 2 • 5 July -WHS 2 • 19 July- WHS 3 • 23 July– Manufacturing 3	May Jun Jul	
IRG Meeting 5 (26 Jul)	Draft Findings		Targeted Consultations (to July)
IRG Working Groups	• 2 August- WHS 4 • 16 August- WHS 5	Aug	

4.1 Industry Reference Group establishment

An industry reference group (**IRG**) was established at the outset of the Review to help guide key review processes and to provide a sounding board for reform proposals.

The IRG initially comprised a limited number of Chief Executive Officer-level representatives from industry, unions and social partners, with some delegation to other officers in the event of CEO unavailability and/or an organisational preference for the technical input of other officers following the first meeting. A list of IRG members is provided at **Appendix 4**.

The IRG met for the first time on 29 January 2021, with attendance by executives from the Australian Energy Council, Clean Energy Council, POWINS, ETU, Energy Queensland, Energy Skills Queensland, Master Electricians Australia, NHP, Powerlink and Stanwell Corporation. The National Electrical and Communications Association could not attend the first meeting. From within OIR, the Executive Directors, the Commissioner and officers from OIR and ESO attended. The WESP team have provided ongoing Secretariat support to all meetings for the Review.

At the first IRG meeting, the Reviewer explained the background and purpose of the review and the role of the IRG via a written IRG Terms of Reference (**Appendix 5**), which was endorsed at the meeting. The objective of the IRG was to facilitate consideration of key issues raised by stakeholders during consultation, and to provide feedback on reform proposals that were generated in the review process. The function of the IRG was advisory in nature, with decisions about the recommendations of the Review remaining with the Reviewer.

A key action arising out of the Review was for OIR to share with IRG members an issues paper that would play a key role in consultation activities.

4.2 Public issues paper and communication

In January 2021, OIR developed a detailed issues paper to inform both key stakeholders and the general public about the nature and scope of the Review, and to invite input from both. A draft issues paper was shared with IRG members following the first IRG meeting (29 January 2021), with OIR amending the issues paper following feedback from members (an action arising from the second IRG meeting held on 22 February 2021).

The Issues Paper (**Appendix 6**) was released online on 5 March 2021 on the WorkSafe website (www.worksafe.qld.gov.au) and remained online for a six-week period to invite public written submissions. Specifically, the issues paper invited feedback from stakeholders on any or all of 10 questions:

1. If any, what changes should be made to the scope of 'electrical equipment' and the related definitions of 'electrical installation' and 'electrical work' under the Act, considering technological changes over time?
2. If any, what changes should be made to the scope of 'serious electrical incident'

and 'dangerous electrical event' considering threshold issues of near misses and voltages involved, particularly considering technological changes over time?
3. Is there benefit in adding examples of various terms that draw on technological changes over time and are therefore clearer to interpret and apply to the contemporary environment? If so, what examples should be included?
4. If any, what changes should be made to the objects and regulation-making powers of the Act to ensure they are broad enough to encompass duties to ensure electrical safety in the contemporary environment?
5. If any, what changes should be made to ensure existing duties, such as those of suppliers and importers, are off sufficient scope to ensure safety in the contemporary environment?
6. Is it necessary to made changes to ensure the clarity of the status and application of codes of practice? If so, how could this be achieved?
7. If any, what changes should be made to align the Act with the Work Health and Safety Act?
8. More broadly, if relevant, how should the Act be changed to ensure new technologies for generating, distributing and supplying electricity are captured within key definitions, reflected in the scope of 'electrical work', and also reflected in key duties to ensure electrical safety?
9. What, if any, changes are required to improve electrical safety in relation to electrical worker and contractor licenses?
10. Are there any other changes that should be made to the Act that would improve electrical safety in Queensland?

Following the issues paper going live on the WorkSafe website, OIR emailed key stakeholder groups beyond IRG members, including:

- Work Health and Safety Board and Industry Sector Standing Committee members
- the Electrical Safety Board and Electrical Licensing Committee
- the Consultative Committee for work-related fatalities and serious incidents; and
- the Executive Director, Specialised Health and Safety Services (OIR).

More broadly, through the following online channels, OIR communicated publicly to ensure broad awareness of the Review and the public written submission process being undertaken:

- eSAFE Electrical bulletin (February 2021)
- WorkSafe website: Electrical Safety Laws (February 2021 to date)
- ESO social media post on the eSAFE Electrical bulletin (4 March 2021)
- Link to WorkSafe website on the 'Get Involved' Queensland Government consultation portal [https://www.getinvolved.qld.gov.au/]
- Dedicated social media post on the ESO Facebook Page with 14,000 followers (17 March 2021)

4.3 Written submissions to the Review

On 18 April 2021, the period for public written submissions closed. The Review received 42 on-time submissions, with late submissions accepted at the discretion of the Reviewer. **Appendix 7** contains a list of organisations and individuals that made submissions to the Review.

OIR's analysis of written submissions uncovered several key issues or themes. These included (but are not limited to):

- the scope of the key definitions in the Act, which establish what is and is not regulated by Queensland's electrical safety laws, namely "electrical equipment", "electrical installation" and "electrical work";
- the objects of the Act and regulation making powers under the Act;
- modernising the Act;
- the *Work Health and Safety Act 2011* alignment;
- solar farms work and safety requirements;
- live work safety requirements;
- licences, including electrical licencing requirements and low voltage activities;
- Cathodic protection systems licensing requirements;
- requirements on domestic vessel ship operators;
- electric vehicle work and safety;
- testing and inspection requirements;
- safety switch regulations;
- requirements to de-energising ceiling spaces; and
- training requirements, including continuing professional development requirements (CPD).

From March to August 2021, the Reviewer held extensive one-on-one consultations with diverse stakeholders to understand the priority issues for each stakeholder, including from among the various issues – big and small – raised in the written submissions received by the Review. These consultation activities are detailed at **section 4.6**.

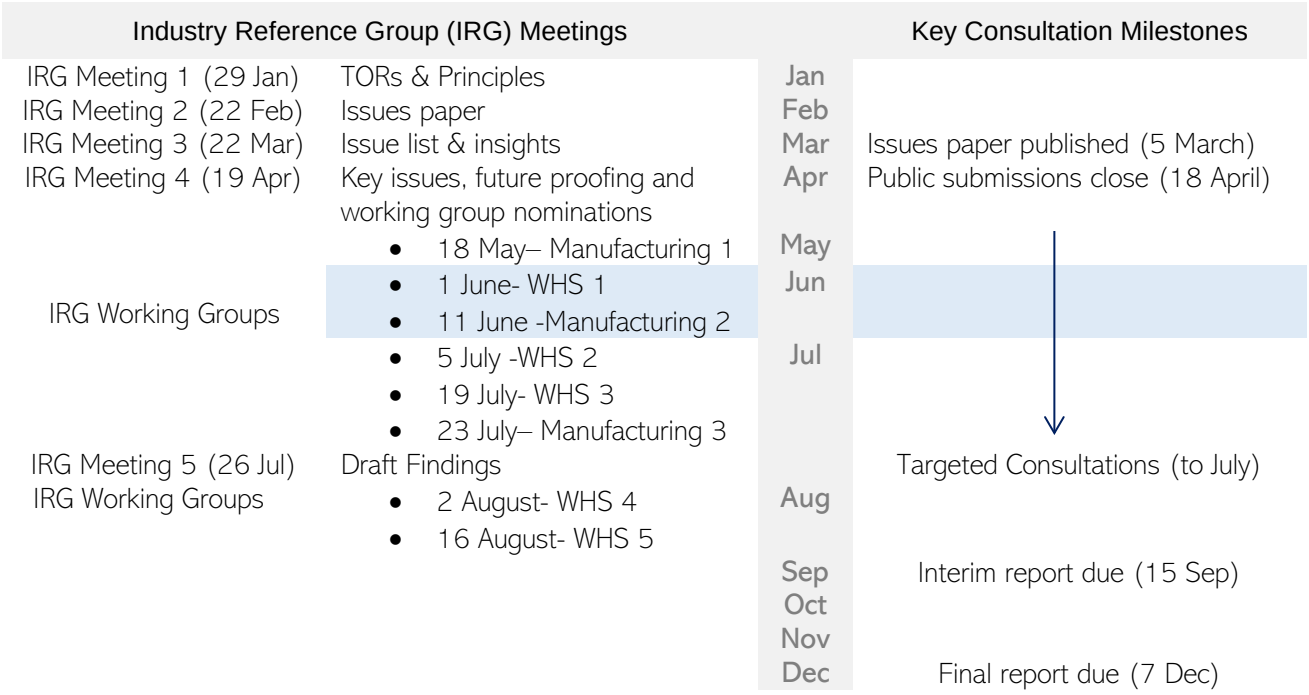
4.4 Departmental issues register

In recent years, OIR has recorded various issues raised with the Act and Regulations in various issues registers. This collective information has been brought together into one central issue register that lists more than 150 issues, spanning minor administrative matters to key definitional matters. These issues, raised largely by departmental officers over time, were considered as part of the Review process.

4.5 Industry Reference Group (IRG) and Working Group meetings

As noted at **section 4.1**, above, an Industry Reference Group (**IRG**) was convened as a small, targeted committee of representatives from industry, union and social partners. An overview of both IRG meetings and IRG Working Group meetings, along with other key consultation milestones is provided in the table below.

Table 1: IRG meetings, key topics and consultation milestones



A. IRG meetings

IRG meetings were held monthly from January 2021 to April 2021, to ensure the direction of the Review developed in line with key stakeholder expectations. Summaries of the key points of discussion in each meeting are set out below.

IRG Meeting 1 -29 January 2021
The Reviewer welcomed members of the IRG and provided an overview of the terms of reference, guiding principles and governance arrangements for the Electrical Safety Act Review. The Reviewer noted the role of the IRG was consultative and his intentions to establish working groups chaired by members of the IRG to discuss key issues raised during the course of the Review and provide recommendations in relation to the issues. Members endorsed the terms of reference for the IRG. IRG members sought a draft of the issues paper for public consultation and papers on the following: inter-jurisdictional analysis, OIR's Issues list and future proofing inputs ahead of the next meeting.

IRG Meeting 2 – 22 February 2021
Following out of session circulation of the draft issues paper for public consultation, IRG members provided feedback to OIR for consideration. The Reviewer provided an update on consultation activities to date which included meetings with the ES Board, the Consultative committee for work-related fatalities and serious incidents and WHS Board. Members noted an issue had been raised with regards to accessing appropriately licensed and qualified electrical contractors and electricians in regional and remote areas. Access and cost were raised as significant barriers for consideration in the review. The OIR issues register was provided to members and the Reviewer invited feedback from members. The Reviewer proposed a breakdown of working groups for the IRGs consideration, noting the groups would be formed on a needs basis. IRG members were encouraged to consider which working groups they were interested being involved in ahead of formation.

IRG Meeting 3- 22 March 2021
The Reviewer provided an overview of themes identified in the 5 submissions that had been received to date. An update was provided by OIR on the public submission communication channels including the WorkSafe website, social media, an E-safe article and the *Get involved* whole of government consultation page. The Reviewer provided an update to members on the one-on-one consultation meetings since the previous meeting. The Reviewer advised members he anticipated consultation meetings would continue through to the end of April. The Reviewer noted the working groups were ready to be circulated to the IRG. The Reviewer invited input from the working group on the future proofing paper and noted that the public consultation period would end on 19 April 2021.

IRG Meeting 4- 19 April 2021
The Reviewer provided an update on one-on-one consultations to date and advised members that approximately 50 submissions had been received in response to the public consultation issues paper. The Reviewer advised members that the Workplace Health and Safety working group and Manufacturers, Wholesale and Retailers working group would go ahead, chaired by Jacqueline King (QCU) and Donna Heelan alongside the A/Director, Supply and Networks, ESO respectively. The Reviewer discussed upcoming consultation with the group and noted his interest in Victoria's approach to extra-low voltage work.

Following the April 2021 IRG meeting, the Review turned its focus to Working Group meetings throughout May to July (see details under section B, below), and to the task of researching, discussing and finalising its draft findings, which were presented to the IRG on 26 July 2021.

Meeting 5- 26 July 2021
The Reviewer reminded members of the terms of reference of the review before presenting on key findings of the review that will inform the recommendations made in the final report. The Reviewer presented on findings under each of the terms of reference including ensuring effective definitions and future proofing, ensuring effective duties, ensuring alignment with the WHS Act and enhancing safety with evidence-based reforms. The Reviewer provided a consultation update and thanked members for their contributions to date. Representatives from the ETU and ESQ congratulated the Reviewer on his work to date

B. IRG Working Groups

To support the Reviewer and the IRG, the Reviewer established two working groups to consider specific issues related to their scope. These working groups were focused respectively on the detailed exploration of issues concerning (1) Workplace Health and Safety and (2) Manufacturers, Wholesalers and Retailers.

The Working Groups provided valuable input to the Reviewer that have assisted in finalising findings and drafting this report. **Appendix 8** contains a list of Working Group members, along with summaries of the key points of discussion in each Working Group meeting.

4.6 Consultation meetings

To support the Act Review, the Reviewer scheduled one-on-one consultation meetings with key stakeholders. These meetings provided key stakeholders the opportunity to raise issues, concerns, discuss submissions and advocate for change on behalf of their organisation whilst also providing an opportunity for the Reviewer to work collaboratively with stakeholders in developing key recommendations.

Key stakeholders that have taken part in one-on-one consultations include unions, industry representatives, relevant government departments, statutory bodies and appropriate boards and committees. Follow up consultations were also conducted by the Reviewer to communicate and broadly discuss findings and proposals with key stakeholders. The table below sets out consultation meetings held each month from February 2021 onwards.

Table 2: List of Review consultation meetings (February-September 2021)

February	
• Electrical Trades Union (ETU)	• Workplace Health and Safety Board
• Electrical Safety Board	• Consultative Committee for Work-Related Fatalities and Serious Incidents
• DESBT's Industry Advisors Stakeholder Group	
March	
• POWINS (Electrical Contractor)	• ESO Inspectorate
• Energy Skills Queensland (ESQ)	• National Electrical and Communications Association (NECA)
• Master Electricians Australia (MEA)	• Australian Industry (AI) Group's EESMF
• Powerlink	• ES Board and Committees
April	
• Queensland Farmers Federation (QFF)	• ES Licensing Committee member – Veronica Mauri
• Energy Safe Victoria	• Energy Queensland Ltd
May	
• AgForce	• Government Owned Corporations (GOCs)

• Independent Prosecutor's Office*	• Queensland Sugar
• WHSQ Board Industry Standing Sector Committees (ISSC's)	• Australian Institute of Health and Safety
• Residential Tenancies Authority*	• Office of the Queensland Training Ombudsman
• Engineers Australia	• Australian Sugar Milling Council
June	
• ESO subject matter expert	• Real Estate Institute of Queensland (REIQ)
• Resources Safety and Health Queensland (RSHQ)	• Department of Communities and Housing
• Tenants Queensland	
July	
• Queensland Building and Construction Commission (QBCC)	• Department of Energy and Public Works (DEPW)
• NFIA	
August	
• Master Electricians Australia (MEA)	• National Electrical and Communications Association (NECA)
• Electrical Trades Union	• Government Owned Corporations (GOCs)
• Consultative Committee for Work-Related Fatalities and Serious Incidents (CCWRFSI)	
September	
• Energy Queensland Ltd	

Chapter 5: Key Issues for consideration

5.1 Scope of the *Electrical Safety Act 2002*

The Act establishes a legislative framework to define and regulate electrical safety standards across the state, with the aim of preventing people being killed or injured by electricity, and property being destroyed or damaged by electricity.

In addition to outlining electrical safety definitions and duties, the Act sets out an electrical safety framework that:

- establishes safety management systems for electrical entities (including power authorities and Queensland Rail)
- provides a system of licensing for electrical workers and contractors
- establishes standards for both industry and the public through the *Electrical Safety Regulation 2013* and codes of practice
- establishes compliance and enforcement including penalties for breaches of the Act
- provides consumer protection against electrical work not being properly performed or completed
- establishes a consultation structure through the Electrical Safety Board and associated committees, with functions including participation in development of requirements for the electrical safety of electrical equipment.

The scope of the Act is necessarily extensive, as it underpins the entire electrical safety framework for Queensland.

Further, the Act is supported by the *Electrical Safety Regulation 2013* (Qld) (**Regulations**), and five electrical safety codes of practice. The Regulations provide further detailed information on how duty holders must meet the electrical safety requirements of the Act. The electrical safety codes of practice give practical advice to duty holders on how to meet their electrical safety responsibilities, in relation to particular hazards or risks.

5.2 Breadth of issues raised with the Review

Queensland's current electrical safety laws were last comprehensively reviewed prior to 2002, when the Act was introduced. Not unexpectedly, therefore, the review stakeholders have raised a broad range of reform proposals, covering aspects of the Act itself, the Regulations, codes of practice made under the Act, as well as issues beyond the scope of the review. The issues encountered range from the broad aim of incorporating emerging renewable technologies within the scope of the Act, to detailed, minor changes to specifics of regulations. The diversity and detail of the issues raised, along with the technical nature of many, means the Reviewer's task has been considerable.

Chapter 6: Ensuring effective definitions and future proofing

6.1 Technological change and "future proofing"

In contrast to the drivers for the development of the Act in 2002, the key driver for the current review is that since the Act and associated regulatory functions were established, the relevant technological landscape has changed significantly, with electricity generation, supply and distribution transforming in ways not contemplated almost 20 years ago. To bring this broad statement to the level of specific examples, it is useful to consider the recent history of attempts to regulate emerging technologies *without* altering the Act itself.

A. Attempt to regulate solar farms

On 4 April 2019, the Governor in Council approved the making of the *Electrical Safety (Solar Farms) Amendment Regulation 2019*, Subordinate Legislation No. 46 (**Solar Farms Regulation**) (Minute No. 111). The Solar Farms Regulation inserted section 73A into the Regulations and commenced on 13 May 2019. At the same time a new Code of Practice commenced *Construction and operation of solar farms code of practice 2019*.

Section 73A purported to require the mounting, locating, fixing and removal of solar panels at solar farms to be undertaken by licensed electrical workers only. The intent behind this requirement was to increase electrical safety on solar farms in response to the emergence and fast-moving growth of the solar farm industry and the associated risks of electrical shock and fire.

On 29 May 2019, the Supreme Court of Queensland declared section 73A of the Regulations invalid and beyond the powers of the Act: *Maryrorough Solar Pty Ltd v The State of Queensland* [2019] QSC 135. By decision dated 25 June 2019, the Court of Appeal affirmed the primary judge's decision in the matter: *State of Queensland v Maryrorough Solar Pty Ltd* [2019] QCA 129. Section 73A was then formally removed from the Regulations by an amendment regulation (*Electrical Safety Amendment Regulation (No. 1) 2019*).

At the time, the Minister for Education and Minister for Industrial Relations, the Honourable Grace Grace MP (**Minister**), noted the "decision clearly highlighted that Queensland's electrical safety laws had not kept pace with new and emerging technologies, including large-scale solar farms".

Solar Farms Industry Roundtable

On 25 June 2019, the Minister announced via media release that the Electrical Safety Commissioner (**Commissioner**) would convene a roundtable to discuss safety in large-scale solar farms. The Minister noted:

> "The Electrical Safety Act has not undergone any significant changes in 17 years. A great deal of technological change and the emergence of new industries have occurred since this time … It is important our safety laws reflect contemporary industry and are able to respond to new and emerging industries, such as large-scale solar farms".

On 23 July 2019, the Minister wrote to the Commissioner requesting the urgent convening of an industry roundtable to discuss safety in the solar farm industry, options for legislative amendment to ensure the Act keeps pace with this fast-growing industry and emerging technologies and matters that should be addressed in a long-term review of the Act.

The Expert Roundtable comprised members with expertise and involvement in the solar farm industry namely: ETU; Construction, Forestry, Maritime, Mining and Energy Union; National Electrical and Communications Association; Master Electricians Queensland; Ai Group; Clean Energy Council; Smart Energy Council; Department of Natural Resources, Mines and Energy; and Department of Employment, Small Business and Training. The roundtable met three times: on 7 August 2019, 9 October 2019 and 20 November 2019.

Electrical Safety Commissioner's recommendations

On 20 January 2020, the Commissioner drew on the outcomes of the roundtable process, as well as broader experience as Chair of the Electrical Safety Board and Chair of the Electrical Licensing Committee, to deliver findings and recommendations to the Minister in the form of *Improving Electrical Safety in Queensland: A Report by the Commissioner for Electrical Safety* (**Commissioner's Report**) (see **Appendix 9**). The first recommendation of the Commissioner's Report is that the Queensland Government should undertake a review of the Act including "the objects of the Act and regulation-making powers, to ensure it is fit for purpose and can keep pace with new and emerging technologies".

The Commissioner's Report made nine recommendations in total. The recommendations included addressing the specific issues of safety in the solar farm industry, as well as broader matters that could be addressed in a review of the Act. Of the nine recommendations, five recommendations require legislative change (Recommendations 1, 2, 3, 8 and 9) and four recommendations require non-legislative change (Recommendations 4, 5, 6 and 7).

B. The challenge of keeping pace with technological changes

Keeping pace with technological changes is a perennial problem for legislation that is by its nature cast at the level of general concepts intended to apply to myriad situations. Sometimes, the generality of the legislative concepts can encompass technological advancements that did not exist at the time the legislation was drafted. However, technological changes can demand conceptual changes for the legislation to continue to achieve its purpose.

The latter situation characterises the Act as it approaches 20 years of operation in Queensland. The last two decades have seen a proliferation of different forms of electricity generation, particularly the growing prevalence of alternative and consumer-based generation and storage in the forms of solar power and batteries. A new de-

centralised norm is emerging that is not contemplated by the Act, creating a gap in coverage by safety laws.

While changes to regulations (subordinate legislation) is one option to adapt legislation to technological changes, the Government's recent attempts to do this by creating safety standards for solar farms in the Regulations was ultimately unsuccessful.

Technological changes, combined with the limited nature of the concepts found in the Act, have therefore made it difficult to adapt to change via subordinate legislation. This situation makes it necessary to consider making changes to the Act itself, to adapt to new circumstances and the changing electrical risks they bring. How to do this has been a core question for the Review.

C. Principles-based approach to future proofing legislation

In developing legislative frameworks, law makers draw an important distinction between rules and principles:

- **Rules** are specific requirements for specific situations. In the present context, we can think of a future technology, its risks, and attempt to make a rule to prevent or lessen those risks. Examples include the Wiring Rules, or detailed, explicit regulations in the Regulations.
- **Principles** do not prescribe a detailed step, but instead focus on an overall objective that can apply to various specific situations, foreseen or unforeseen. Examples of principles in legislation include the objective (or "object") of a piece of legislation. The scope of legislative principles is often set through other provisions in the legislation, including important definitions. In the Act, core definitions include "electrical work", "electrical equipment" and "electrical installation".

Although **making rules** for particular technologies can offer some short-term utility, its ongoing usefulness depends on accurately predicting:

- the nature of the technology
- the nature of the risks it presents; and
- a cost-benefit analysis to arrive at the appropriate level of regulation to lessen or eliminate those risks.

In an industry as dynamic and technology driven as the electrical sector, trying to accurately predict the future and its implications for electrical safety is highly challenging. There is a strong probability that new rules based on prediction now may not fit situations that arise in the future or may not cover all future technologies or safety risks arising from them.

For these reasons, legislative review processes generally focus on **principles** as a way to provide the most effective degree of future proofing without having to create a host of new rules based on assumptions and predictions that may or may not prove accurate in time. Combined with sufficiently broad powers to make specific rules in subordinate legislation, a principles-based approach provides a greater degree of future proofing than

attempting to predict new technologies and make pre-emptive rules to address possible safety implications.

'Future proofing' the Act therefore means ensuring the objectives, powers, and fundamental definitions in the Act are fit for purpose and framed in a manner that allows flexibility for new regulations to be made in response to emerging technologies and new safety implications arising from them.

6.2 Relevance and effectiveness of definitions

Division 4 of the Act (sections 8-25) covers the topic of "interpretation" and defines the core concepts found in the Act. These core definitions have formed a significant area of interest for the Review, particularly the definitions of "electrical equipment" and "electrical work". The core definitions in Division 4 of the Act determine what is encompassed by the duties and requirements of the electrical safety legislation in Queensland and what is not.

In order for the Act to continue to achieve its purpose, the definitions need to be sufficiently broad to cover the full span of electrical work, equipment, electricity entities and processes that present electrical risks. However, it is also important that the definitions do not extend unnecessarily into the regulation of entities, equipment and processes that do not present a legitimate electrical safety concern.

6.3 Core definitions

Several terms are core to the Act and establish the scope of its regulatory reach. These core definitions are the first object of consideration. The relationship between the foundational definition of "electrical equipment" and, in turn, (A) renewables and emerging technology, (B) electric vehicles, and (C) hydrogen as an energy and storage source, as well as (D) the concept of extra low voltage as the key determinant of what is and is not considered "electrical equipment". Following these discussions and related recommendations, the regulation of (E) "electrical work" is considered in respect of solar panels (including on solar farms), air conditioners, electric vehicles and fire protection installations in particular. Finally, at (F) the purpose of the Act and its regulation-making powers are examined.

A. Renewables, emerging technology and "electrical equipment"

A deep understanding of electricity is only a few hundred years old, with the use of electricity in equipment to serve human needs arising within the past 200 years. 2021 is the 100-year anniversary of Einstein's Nobel Prize in Physics for his work on the photoelectric effect, a key component of solar panel functioning. The application of electricity continues to evolve and with it great benefits. The relatively recent conveniences available to modern societies by employing electricity through various systems and devices also comes with the inherent dangers of electricity. Navigating the dangers that come with the great benefits of electricity's employment is core to the Act. Ensuring the Act is calibrated to continue to do so as technology evolves is an ongoing task.

Since the Act commenced in 2002, energy technology has evolved at a rapid rate. With the emergence of alternate clean technologies, shifting priorities and technological advancements, predicting what the future of energy will look like is challenging. However, drivers for technological advancement, and patterns in emerging technology can be used to provide a strong indication of the direction energy is taking in Australia. With increasingly more consumers seeking the most reliable, affordable and environmentally responsible energy sources, consumer demand for solar and wind has increased. At the same time, large-scale generation via renewables has increased, as evidenced by the establishment of numerous "solar farms" in Queensland in recent years. Along with solar, batteries for the storage of generated electricity complements generation via renewables.

As raised at [6.1], above, an attempt to regulate work on photovoltaic (**PV**) solar panels at large-scale solar farms was attempted in 2019 via amendment to subordinate legislation made under the Act. This attempt was ultimately unsuccessful. While somewhat technical, the reasoning can be simplified by reference to the Act's core definitions. The Act sets up a straightforward foundation for its regulatory structure.

The scope of what is regulated by the Act is determined first and foremost by what is and is not deemed "electrical equipment". Importantly, certain work on "electrical equipment" can only be performed by a licensed electrical worker. The term "electrical equipment" has a technical definition. Not *every* form of electrical equipment needs the attention of a trained and licensed electrical professional. This is explained by both the nature of electricity and the purpose of the Act. The purpose of the Act is to prevent death, injury and destruction that can be caused by electricity, and not all electricity has the potential for these kinds of harm. The concept of "electrical equipment" is therefore defined by way of a threshold, namely those forms of equipment with voltage "greater than extra low voltage" (Act, s 14(1)), as a starting point. In turn, an "electrical installation" is a conglomeration of "electrical equipment". Finally, work on electrical equipment or electrical installations is deemed "electrical work" and is regulated by way of a licensing scheme and certain standards depending on the exact form of work and its risk profile.

Essentially, the work intended to be captured by the repealed solar farms regulation did not fall within the definition of "electrical work", as the solar panels themselves did not fall within the definition of "electrical equipment". The reason for the latter conclusion was that, individually, the solar panels the subject of the regulation and factual dispute in question were not greater than extra low voltage. One may, at that point, move on to consider the voltage level of two or more connected solar panels. However, as the regulation referred to "a solar panel", judicial deliberations on the regulation did not proceed further.

A solution, then, is clear enough from simply stating the facts. The solution is to explicitly include within the definition of "electrical equipment" solar panels when connected to be of a combined voltage of greater than extra low voltage. The same approach is open in respect of connected battery cells. Such an approach was recommended in the *Commissioner's Report* following the solar farm roundtable process noted at [6.1], above.

More recently, at the outset of the public consultation process for this Review, the public issues paper asked stakeholders what changes should be made to the scope of "electrical equipment" considering technological changes over time. Written submissions and

subsequent stakeholder meetings involved various suggestions, but common ground on the desire for clarifying core definitions with an eye to the future. Industry associations, unions, and the ES Board and Committees all raised the need for the Review to consider new and emerging forms of electrical equipment in the definition of "electrical equipment".

In line with the *Commissioner's Report*, stakeholders broadly considered that this must extend to solar PV panels, as well as batteries, at a certain threshold. NECA broadly advocated for including solar panel and battery storage system regulations within the Act and Regulations. Both the ETU and Energy Queensland did, likewise, offering specific details. The ETU advocated for solar PV panels to be deemed "electrical equipment" where "installed in an array, either grid connected or stand alone". Energy Queensland recommended including within the "electrical equipment" definition "solar photovoltaic modules (where potential above extra low voltage exists), inverters and other electrical equipment (including protection devices, energy monitoring devices, etc)", as well as "battery system[s] (where potential above 4cal / cm2 exists)" within the definition of electrical equipment.

To the same effect as the specific proposals by the ETU and Energy Queensland, Stanwell Corporation proposed a specific amendment to the section 14 definition of "electrical equipment". However, Stanwell Corporation offered a more general concept of "an individual generating source when connected to other generating sources with the purpose of generating power collectively above extra low voltage, either grid connected or stand alone". This would encapsulate solar PV panels, but potentially provide broader future proofing. Likewise, as an alternative to direct reference to batteries, Stanwell Corporation suggested "an individual energy storage device when connected to other energy storage devices with the purpose of storing and releasing power collectively above extra low voltage either grid connected or stand alone." Regarding terminology, and aligning with Stanwell Corporation's suggested concept of an "energy storage device", the CEC noted "the term 'battery' may be too narrow in the long-term and we suggest that the use of a term such as 'energy storage device' may be more appropriate."

Origin noted "increased inverter-based technologies in the grid present a challenge in the management of risk, both of static discharge and earthing potential", concluding that therefore the "electrical equipment" definition "may need to be broadened". From the perspective of avoiding over-regulating, the CEC recommended excluding items such as "single batteries" from the definition of electrical equipment, to avoid actions such as replacing a smoke detector battery being considered "electrical work".

Conveniently, the pre-established threshold of greater than extra low voltage can be applied un-contentiously to capture relevant generation and storage devices, while excluding equipment and actions that do not pose an electrical safety risk. Without including the former in the scope of the "electrical equipment" definition, the growing market and rapid evolution of batteries and off grid generation pose risks to workers and the community that will result in incidents and injuries that are avoidable. It is therefore considered appropriate to recommend the inclusion of solar and batteries in the definition of electrical equipment. Recommendation 1 does this via adaptation to the Act's existing definition of "electrical equipment" – being equipment of greater than extra low voltage. More involved questions of exactly what forms of work on solar PV panels, for

example, are to be considered "electrical work" are detailed below, under section E (Electrical work). The results of those considerations are found in Recommendation 5.

Finally, it is important to note that the approach of defining solar PV modules to be "electrical equipment", when connected to be of a combined voltage of greater than extra low voltage, covers the solar farm context but is not limited to it. Depending on the voltage of the solar panels in question, a small number could add up to be greater than extra low voltage. An example is the use of solar on rooftops. In contrast, two panels are unlikely to reach the threshold of greater than extra low voltage and therefore not be "electrical equipment" based on Recommendation 1. An example of such a situation discussed during the Review is solar powered caravans. For this reason, caravans are further considered in the discussion of extra low voltage equipment below at section D.

Recommendation 1: It is recommended that modernising the scope of the Act to ensure new and emerging energy generation and storage technologies are incorporated, whether or not they are connected to the grid or stand-alone in nature, by including in the definition of electrical equipment/electrical installation:
(a) solar PV modules, designed to be connected to other solar PV modules and when connected be of a combined voltage of greater than extra low voltage; and
(b) battery cells, when connected to other cells for the purpose of storing and releasing power of a combined voltage of greater than extra low voltage.

B. Electric vehicles and "electrical equipment"

At the time of writing, the sale of all-electric vehicles is growing in Australia, with a nascent second-hand market emerging. Electric vehicles are not new, dating to around the mid-1800s with the invention of the rechargeable lead-acid battery. With improvements to efficiency and developing electricity infrastructure over the following 50 years, in the early 1900s electric vehicles were not uncommon in Europe and the United States, though operating speed, range and recharging infrastructure were far from ideal. For those and other reasons, gas-powered vehicles all but replaced electric vehicles at around the start of the 20th century. It took around 100 years for any significant number of electric vehicle stock to re-emerge.

In 2002, when the Act was developed, electric vehicles were still yet to reappear. The underlying lithium-ion battery allowing long-distance travel had been commercialised around 10 years prior. However, developing the technology to the point of the first mass produced, long-distance all-electric car was years away. Tesla released the Roadster in 2008, a catalyst for electric car manufacturing in a similar way that the Model T Ford was for gas-powered cars 100 years earlier in 1908.

The first electric cars became available in Australia around 2010 but are only now beginning to become commonplace. No doubt many Government regulators at both state and federal level are now considering potential safety implications. At this moment, it is critical that different regulators collaborate to avoid the extremes of over-reaching or duplication on the one hand, and leaving a gap in safety oversight on the other.

Naturally, the companies that import electric vehicles have a great incentive to ensure safety is paramount. However, standards will differ from manufacturer to manufacturer and from country to country. Manufacturers' assumptions about use, surrounding infrastructure and the kinds of interactions that may take place with electric vehicles means regulators cannot be complacent when considering safety implications for Australians. In other words, we cannot assume that the new dawn of electric vehicles is without risks. The purpose of the Act is to avoid loss or damage to lives and property. Electric vehicles are no special exception to that important objective, however appealing the technology is for other reasons. Electric vehicles have therefore been considered for inclusion in the scope of regulation by the Act in the course of this Review.

Stakeholders including NECA and the ETU sought coverage of electric vehicles and charging stations by electrical safety legislation, noting the levels of DC voltage in vehicles are becoming quite high. Voltex Power Engineers also suggested including vehicle charging stations within the definition of "electrical equipment". Consistently with these submissions, but more specifically, the ESB and Committees noted in relation to vehicles, including based on input from Ergon, that:

> "Batteries and some energy storage devices have electrical risk which could be far greater than licensed electrical AC work, say for domestic switchboards, that are currently only captured as Electrical Equipment where the DC voltages are above 120V. To some degree, voltage is almost irrelevant in assessing the nature of the danger for batteries. Arc flash potential for batteries can be significant – for example – a 24V DC battery bank in an enclosure may have the potential for a 30kA short circuit current (typically where parallel battery banks are used) which could result in an arc flash energy of 10.7cal/cm2 and an arc flash boundary of over 1.3 metres."

While the application of the Act (s 6) excludes the operation of the Parts of the Act covering licensing (Part 4) and electrical safety duties (Part 2) "at a mine", RSHQ recommended that electrical propulsion system components (e.g. generators, battery storage, control equipment, large switchboards, propulsion motors, cabling, etc.) for vehicles used on mines be included within the meaning of "electrical equipment". RSHQ's concern arises from the low or high voltage status of electric vehicles used at mine sites, up to 300 tonne mining dump trucks that contain large onboard switchboards. Onboard battery storage systems are expected to substantially increase, especially given advantages over diesel in some environments. While it presently appears to the Review that the application of the Act presents jurisdictional issues, OIR may wish to engage further with RSHQ on this matter to complement regulatory approaches. This is considered further below in relation to the definition of "electrical work", including reference to guidance material that has been produced by RSHQ.

Regarding the current state of the Act, while electric vehicles might prima facie be included in the definition of "electrical equipment" (s 14(1)), the exceptions listed in s 14(2) are relevant. Sub-section 14(2) provides (underlines added):

> Electrical equipment does not include any apparatus, appliance, cable, conductor, fitting, insulator, material, meter or wire that is part of a vehicle if—

(a) the equipment is part of a unit of the vehicle that provides propulsion for the vehicle; or
(b) the electricity source for the equipment is a unit of the vehicle that provides propulsion to the vehicle.

Examples of things that, under subsection (2), are not electrical equipment—

- the headlights of a vehicle
- ignition spark plugs of a motor vehicle
- the interior lighting system of a vehicle, if powered from a battery charged by the engine that drives the vehicle or by the vehicle's movement

Examples of things that are not prevented by subsection (2) from being electrical equipment—

- interior lighting or a socket outlet in a caravan, if the lighting or outlet is operated by a low voltage generating set or connected to low voltage supply
- a refrigeration unit in a food delivery vehicle operating at low voltage from a source separate from the propulsion unit for the vehicle.

The Act's reference to vehicles, based in the Review's understanding on much earlier legislation on electricity, were not devised with electric vehicles in mind. Importantly, the flow on effect for the definition of "electrical work", considered below, was also not legislated with the reality of electric vehicles in mind, and what regulations should be in place for kinds of work on them. However, given the generality of the section, it is possible to consider whether electric vehicles (or parts therefore) are *currently* "electrical equipment". This turns on whether or not the part in question "provides propulsion for the vehicle".

Consistently with this approach, it will be necessary to ensure that for electric vehicles the electric propulsion components or electric drive train, including motors, storage systems and their interconnections are to be electrical equipment. Similarly, it will also be necessary to maintain the current exclusion of parts that are ancillary, such as headlights, air conditioners, etc., ensuring they remain outside the scope of "electrical equipment" (and therefore "electrical work"). The Review's interest and concern lies with the electrical safety aspects of the electric drive train of contemporary electric vehicles, including, for example, the potential for significant arc flash burns.

With the above considerations in mind, and in view of a growing market of electric vehicles in Australia, the Review is cognisant of a growing risk entailed in what is otherwise a beneficial technological development. Increased demand will undoubtedly lead to more work on electric vehicles and therefore exposure to associated risks, whether off road, on road and even in on road emergency situations. To avoid complacency, it is considered that capturing electric vehicles in the scope of regulation by the Act, beginning with a suitably inclusive definition of "electrical equipment", is necessary. Ideally, such developments should occur through engagement with other jurisdictions.

The practical upshot in terms of regulating kinds of work involving electric vehicles are considered further below under section E (Electrical work). The results of those considerations are found in Recommendation 8.

Recommendation 2: Review the electrical safety risks presented in electric vehicles and consider their inclusion in the scope of regulation by the Act. It is further recommended that the Electrical Safety Office engage with other relevant Queensland

and Australian regulators as needed to ensure appropriate scope and to avoid both regulatory gaps and duplication.

C. Hydrogen and its use in vehicles

As raised in the Commissioner's Report, currently in the electricity sector hydrogen is emerging as a storage mechanism for large amounts of energy due to the opportunity for it to contribute to the resilience of electrical systems. Hydrogen was raised as part of the Review for consideration given its evolving role in the future of battery technology and risk to life and property it may pose.

Notwithstanding its importance, under the current electrical safety framework in Queensland, it appears to the Review that the scope of the legislation's application to hydrogen is complex and somewhat unclear. Section 6 specifies that the Act "does not have application at a mine, petroleum plant or GHG storage plant". The term "petroleum plant" is defined in section 6(3) of the Act as "private plant or an electrical installation that is operated under the *Petroleum and Gas (Production and Safety) Act 2004* (**PGPS Act**) and subject to inspection under that Act." However, the PGPS Act does not use the term "petroleum plant". The upshot of the Review's attempts to understand the relationship between the Act and the regulation of hydrogen is the need for a clearer sense of what is and is not to be in scope.

While hydrogen was not the most prominent issue raised in the context of future proofing the Act, some stakeholders noted the importance of considering its implications. ESQ invited the Review to consider the role industry trends will play in defining the future, the behaviors of consumers and in turn the pressures on the electrotechnology sector to meet these expectations. ESQ noted the interface between electricity as a production source for green hydrogen as a candidate for consideration by the Review.

The Review is also aware of DEPW's advocacy for and assistance in expanding Queensland manufacturing of hydrogen storage and fueling systems and equipment, including for use and interconnection into existing home and commercial electrical systems and installations. It will therefore be essential for the ESO to engage with DEPW. Prima facie, hydrogen systems used in homes and commercial settings interconnected with existing and or new electrical installations and or systems will fall within the Act's core definitions of "electrical equipment" and "electrical work". Exactly how the relationship between these systems and the regulatory reach of the Act should be fashioned will depend on an understanding of electrical risk and safety.

Regarding the application of hydrogen in vehicles, the Review is aware – including through discussions with Hyundai – that drive trains are identical for both electric vehicles and fuel cell electric vehicles (**FCEV**), the latter being those that generate electricity via compressed hydrogen and oxygen from the air. As such, there appears to be little or no distinction to make between EVs and FCEVs in respect of a regulatory approach, which has been discussed in this Chapter above.

Noting the rapidly evolving role of hydrogen in various forms of emerging technology, including batteries and vehicles, and the potential for risk to life and property in an electrical context, the Review is of the opinion that further work should be undertaken to

explore ways to ensure electrical safety of industry, workers and community as a result of the proliferation of hydrogen. Given the embryonic form of this area and also the somewhat unclear degree to which hydrogen is already regulated by the Act, an exploratory recommendation is proposed.

Recommendation 3: Review the electrical safety risks presented in hydrogen-based electricity generation and storage technologies, including hydrogen-powered vehicles, and consider their inclusion in the scope of the Regulation by the Act. It is further recommended that the Electrical Safety Office engage with other relevant Queensland and Australian regulators as needed to ensure appropriate scope and to avoid both regulatory gaps and duplication.

D. Extra Low Voltage "electrical equipment"

As noted above, the definition of "electrical equipment" is characterised by the concept of "extra low voltage" (s 14(1)(a)-(b)) (ELV). Where the electrical equipment is operated at a voltage above ELV it is within the Act's scope. In Queensland, "extra low voltage" is defined to mean "voltage of 50V or less AC RMS, or 120V or less ripple-free DC". The concept of ELV is a proxy for safety. However, like all proxies, it is not a perfect measure.

Voltage is a measure of electric potential, or force behind the motion of electricity. While this provides an approximation of danger, as a concept it is not without limitations. The Act recognises these limitations by making a number of departures from the general extra low voltage threshold. The first exception recognises that ELV equipment can be dangerous in certain atmospheres (s 14(1)(c); further considered in this report at 6.6, (below). The second exception is for cathodic protection systems (s 14(1)(d)).

The limitations of the concept and consequential risk of maintaining the threshold without further adjustment were central themes in a number of submissions to the Review. It is significant that multiple, diverse stakeholder groups raised the need to consider expanding the definition of "electrical equipment" to include forms of ELV equipment.

Regarding standalone or "off-grid" generation, such as by solar power systems not connected to the grid, the ETU recommended that ELV sources be included by reference not to voltage, but to wattage (electrical power expressed in watts). Specifically, the ETU suggested 80,000 watts, or 80 kilowatts (kW), should be the relevant threshold for the definition of "electrical equipment". The ETU also sought the inclusion of ELV solar power systems that are connected to the grid. Similarly, MEA recommended capturing extra low voltage generation technology within the definition of electrical equipment.

Energy Queensland noted the potential for energy storage at extra low voltage to entail electrical risks and threat to human life. With these risks in mind, Energy Queensland recommended the Act capture ELV systems with high arc fault levels, with attendant licensing and electrical work requirements. Differently, but also recognising the limitations of a voltage threshold, the Clean Energy Council sought an intent or purpose-based definition of electrical equipment excluding reference to voltage, as per the definition in AS 3000. Aurizon's submission to the Review also recognised the risk posed by extra low voltage equipment, noting its exclusion from the "electrical equipment"

definition. Aurizon suggested the alternative of a current-based threshold, being the *amount* of electricity in a circuit measured in amperes (amps).

While ELV is intended to provide a threshold of safety, the Review broadly agrees that with the evolution and emergence of new technologies the limitations of the ELV concept have become more pronounced. The purpose of the Act in its broadest terms is to prevent injury, death, property damage and destruction due to electricity. A risk to life posed by equipment – whether or not ELV – is a significant concern. This issue cannot be ignored in the context of a comprehensive review of the Act for the first time in two decades.

As a starting point, the Review considered two abstract approaches that might form the foundation of a future electrical safety framework. First, retaining the ELV threshold for "electrical equipment" in general, but carving out space for exceptions to the ELV rule where there is a perceived need. That is, creating *inclusions by exception*. Secondly, abolishing the ELV threshold, defining electrical equipment of any voltage as within the definition of "electrical equipment" to begin with, and *excluding by exception* certain forms that are considered not to pose a risk to life or property. While the Review seriously considered the second option, ultimately it was decided that maintaining the current approach and creating further inclusions in the definition of "electrical equipment" by exception would be the most straightforward approach, and one least vulnerable to unintended consequences. This approach can broadly address the concerns of all key stakeholder groups.

In addition to the matters noted above as being raised by stakeholders, a number of specific contexts in which an exception to the ELV threshold may apply were considered throughout the conduct of the Review.

Solar PV panels on caravans

As noted in section A, above, caravans are an example of the use of solar panels that may not, in combination, add up to a combined voltage of greater than ELV. Given the regulation and safety standards applying to the use of gas in caravans, it is difficult to ignore risks arising, for example, from the unlicensed installation of solar panels on caravans. The potential for shock, fire or other property damage is obvious. Energy Queensland therefore suggested including in the definition of "electrical equipment":

> "the switchboard, wiring, charging system lighting, socket outlets and other electrical equipment for electric vehicle plug-in connection permanently connected within a caravan."

Fire protection equipment

Due to the electrical nature of fire protection equipment, such as the installation of fire alarm systems, along with the significance of these systems for the protection of life, the Review has considered the appropriateness of including fire protection equipment within the definition of "electrical equipment", notwithstanding its ELV status. This topic is considered further under section E (Electrical work).

Telecommunications equipment

Currently, section 55(3)(a) of the Act states an electrical work licence is not required for "performance or supervision of electrical work for the purpose of installing or repairing telecommunications cabling". Telecommunications equipment is generally ELV, and therefore excluded from the definition of "electrical equipment" (and the definition of "electrical work", but for the minority of circumstances where it is beyond ELV, in which case section 55(3)(a) provides exclusions). However, the ESO is of the view that (1) such equipment may consistently go beyond the category of ELV in the near future, and (2) the frequencies involved present an electrical safety risk. While it is premature to recommend including telecommunications equipment within a definition of ELV "electrical equipment" or abolishing section 55(3)(a), the Review agrees with the ESO's proposal to consult with the relevant regulators – the Australian Communications and Media Authority to begin with – to consider the need for training, standards, and the future possibility of electrical licensing for some work on telecommunications equipment.

Examples aside, the precise legislative mechanism by which ELV equipment considered to pose a threat to life and property given the context of its use must be flexible enough to incorporate the kinds of situations referred to above. In line with a principles-based approach to future proofing (see 6.1), it is considered necessary to frame a further definition of "electrical equipment" for ELV equipment to allow for maximum responsiveness to emerging technologies, situations and new safety implications arising from them. This change will improve electrical safety now and in the future as technology continues to evolve and develop.

Recommendation 4: To ensure the Act keeps pace with technological change, consider creating a general category of exception to the "extra low voltage" threshold for the definition of "electrical equipment", to reflect risk to life and property by ELV electrical equipment.

E. Electrical work

The meaning of "electrical work", the central trigger for licencing requirements, is set out in section 18 of the Act largely by reference to the concept of "electrical equipment". Essentially, "electrical work" means various forms of work involving electrical equipment: connecting/disconnecting electricity supply wiring to electrical equipment (s 18(1)(a)), as well as constructing, installing, removing, adding, testing, replacing, repairing, altering or maintaining electrical equipment or an electrical installation (s 18(1)(b)). Establishing this basis for the scope of "electrical work" in sub-section 18(1), sub-section (2) then provides for 15 exceptions to the rule, from (a) to (o). Following on from the discussions in sections A-D, above, on "electrical equipment", the flow on effect for what is captured in the definition of "electrical work" is largely apparent. However, the issue of the need for adjustments or exceptions have been considered by the Review. These are set out below, in turn.

Solar PV panels

The Review received various views from stakeholders on precisely what kinds of work on solar panels should fall within the definition of "electrical work". Reflecting a general need, NECA noted that it should be made clear in the Act and Regulations what is *electrical*

work and what is *construction work* (not electrical work) for solar installations on rooftops and in solar farms.

As a starting-point, and in line with the standard definition of "electrical work", the consequence of defining solar PV modules, when connected to be of a combined voltage of greater than extra low voltage, to be "electrical equipment" is to require all connections of cabling, including earthing and bonding work, to be performed by a licensed electrical worker.

Beyond this central area, there were opposing views on the requirements that should be attached to other forms of work. The CEC recommended excluding heavy lifting, locating, mounting or fixing of solar PV panels from the definition of "electrical work", noting the consistency of this approach with current QBCC legislation. The CEC noted this would align with exemptions in section 18(2). In contrast, the ETU expressed concern with work being done by unlicensed workers or without the direct supervision of licensed workers. Similarly, the Commissioner advocated for strictly regulating connecting or disconnecting supply wiring, as well as locating, mounting and fixing of solar PV panels. The Review is satisfied that these ancillary activities should, at a minimum, be carried out under the supervision of licensed workers. Requirements of supervision are considered in detail at 6.5(B) of this Report.

Recommendation 5: For solar PV panels falling within the definition of electrical equipment (see Recommendation 1), consider ensuring that the resultant "electrical work" definition is amended as needed to require:
(a) all connections and testing of PV module cabling as well as earthing and bonding work be performed by competent licensed electrical worker/s; and
(b) installation of cabling to be carried out by a licensed electrical worker or an unlicensed person assisting a licensed electrical worker and working under their direct supervision; and
(c) the mounting, fixing, and locating of solar PV modules and arrays to be carried out by competent persons under the direct supervision (Recommendation 16) of a licensed electrical worker (Act s 18(1)(f)).

Air conditioners

Another matter raised with the Review was confusion amongst industry as to the classification of work particularly in the context of the installation of split system air conditioners. MEA, for example, noted an apparent inconsistency in the approach of the QBCC and electrical industry legislation and practice. Consistent with the approach recommended for ancillary work on solar PV panels within the definition of "electrical equipment", the Review recommends including within the definition of "electrical work" the electrical aspects of air conditioning/mechanical services work. This includes the fixing, installation of brackets, mounting and mechanical protection of cabling. This approach ensures all work required to be undertaken that is ancillary to electrical work is encapsulated by that definition, providing clarity to industry. In practice, supervision will be required for these ancillary forms of work.

Recommendation 6: Consider including within the definition for "electrical work" that the electrical aspects of air conditioning / mechanical services work is electrical work and the tasks of fixing, installation of brackets/mounting of equipment and mechanical cable protection is ancillary to the complete installation.

Cabling and cable protection

As part of the Review the scope of electrical work was considered. This has previously been discussed in the context of PV panels in recommendation 5. During the Review it was considered that the issue should also be explored in a broader context beyond just work in relation to solar PV cells.

The application of the scope of electrical work was raised during consultation by NECA. NECA sought clarity on laying of conduit in pits; installing cable trays and what is meant by supervision of non-licensed workers and how much supervision is required. NECA also noted members expressed views that laying conduit in pits and installing cables trays was not electrical work but required supervision. Also noted in the NECA submission was confusion around this matter for contractors, workers and apprentices.

A key consideration in the approach for this issue was the fundamental issue that mechanical protection for cables in all situations is an integral component to ensure safety for the electrical installation. Given the importance of mechanical protection for cables and its intrinsic role in ensuring safety, competency was a key consideration. Consistent with the approach taken with PV cells, the Review is of the view that a consistent approach should be broadly taken in terms of the scope of electrical work. In practice this would involve classifying the installation of mechanical protection for cables, including but not limited to conduit, cable racks, trays and skirting and the installation of cabling into these protection components as the work of licensed electrical workers or to be performed under the direct supervision of a licensed electrical worker and as per the wiring rules (AS 3000). Associated with this work is earthing and bonding work, to be defined as electrical work and must only be performed by competent licensed electrical workers. This approach gives consideration to the competence required to undertake this work, in addition to providing clarification where there is confusion around the classification of this work at present.

Recommendation 7: Ensure the installation of mechanical protection for cables, including but not limited to conduit (both plastic and metal), cable racks and trays, skirting, troughs etc., and the installation of cabling into these protection components is the work of licensed electrical workers or to be performed under the direct supervision of a licensed electrical worker. Associated with this work is earthing and bonding work, to be defined as electrical work (recommendation 5) and must only be performed by competent licensed electrical worker/s.

Electric vehicles

Following consideration of including electric vehicles within the definition of "electrical equipment" at section C, above, the implications for work on electrical vehicles must be considered, with the needs of owner/operator, community and first responder safety paramount. Several stakeholders noted the risks associated with carrying out work on

electric vehicles, including both emergency on-road work by first responders and planned work, such as servicing. With technology evolving at a rapid rate and increasing demand, electric vehicles present a unique risk profile to those who service them as well as first responders and the community. These risks are not currently addressed by electrical safety legislation in Queensland.

The ETU advocated for the involvement of electrical fitter mechanics in manufacturing of electric vehicles in Queensland. NECA recommended restricting work on both electric vehicles and charging stations to be limited to electrical workers. NECA also noted that specialist training and licensing requirements should be introduced to cater to the specialist nature of electric vehicles and the risks involved. Training and licensing requirements for those who work on relevant equipment in connection of electric vehicles was also raised by Energy Queensland for consideration.

During consultation, Resources Safety and Health Queensland (RSHQ) noted the rapid technological advancements that have occurred in vehicles, including the introduction of high voltage electric vehicles into Queensland mines. Guidance Note QGN 26 *Electrical Propulsion systems used in self powered earth moving machinery,* is one example of guidance material that has been introduced by RSHQ to respond to safety concerns in relation to accessing high voltage conductors fitted to diesel electric earth moving equipment and meeting Queensland's legislative requirements. RSHQ advised the Review that only licensed electrical mechanics and or electrical fitter mechanics perform maintenance and breakdown repairs on electric vehicles on mine sites – HV and otherwise. These minimum standards should not be lessened as a result of the implementation of recommendations made in this report. Indeed, to the extent that the Act regulates electric vehicles, the RSHQ minimum standards should be applied to work on electric propulsion systems. As noted in considering the relationship between the definition of "electrical equipment" and electric vehicles, above, traditional auto mechanic work, such as on headlights, should not be captured by the Act's regulatory reach.

With the sphere of electric vehicles already expanding into high voltage in the mining environment, it would be remiss to think this would not be on the horizon more generally throughout Queensland. The introduction of HV electric vehicles poses increased risk of arc flash incidents, as addressed in RSHQ's guidance document. Given the work already undertaken in this space by RSHQ, it is noted that Recommendation 8, below, is not intended to impact pre-existing practice that has been established by RSHQ. However, consideration should be given to additional protections that may be required under the electrical safety framework in Queensland.

The technology in this area is evolving at a rapid rate. The voltage of some vehicle batteries presents a risk of electrical shock to those who service vehicles, as well as first responders and the community. In response to the unique risk profile to owners, operators, workers and the community it is proposed that licensing requirements should apply to those undertaking both planned and on-road work on electric vehicles. Noting the existing involvement of other trades such as auto-mechanics in servicing of vehicles (linked with Recommendation 2), the crystallisation and detailed implementation of the matters proposed in Recommendation 8 must be informed by engagement with other relevant regulators in Queensland and other jurisdictions.

Recommendation 8: For electric vehicles (or parts thereof) falling within the definition of "electrical equipment" (see Recommendations 2 and 4), consider requiring:
(a) appropriately licensed electrical workers to carry out the electrical work on the electrical components when the vehicle is serviced and or repaired, to ensure the safety of owners/operators and community; and
(b) appropriately licensed electrical workers carry out the electrical work on the electrical components of the vehicle when an electric vehicle requires on-road break-down work to ensure safety of owners/operators, the community and first responders.

Fire protection installations

Regarding work with fire protection equipment, recent licensing reforms implemented by Government through the QBCC have created the unintended consequence that electrical license holders cannot perform fire protection-related work, such as the installation of fire alarm systems.

Some stakeholders believe this situation should remain, emphasising the specialist nature of fire protection equipment installations. The NFIA advocated for electrical workers to complete further training or provide evidence of experience in this area of work in order to obtain a QBCC license. The ETU, in contrast, emphasised that the core competencies of electrical workers are transferrable to the fire protection equipment installation context without the need for further training.

Previously, Schedule 4 of the *Queensland Building and Construction Commission Regulation 2018* provided the following approach to fire protection work and concomitant technical qualifications:

	Fire protection work	**Technical qualifications**
1	inspect and test commercial or industrial sprinkler and suppression systems	a licence under the *Plumbing and Drainage Act 2002* in the class— (a) plumber holding the endorsement of fire protection (commercial and industrial); or (b) water plumber—fire protection (commercial and industrial)
2	inspect and test domestic or residential sprinkler and suppression systems	a licence under the *Plumbing and Drainage Act 2002* in the class water plumber—fire protection (domestic and residential) a plumbers licence under the *Plumbing and Drainage Act 2002* with an endorsement fire protection— domestic and residential
3	inspect and test fire pumps, fire hydrants and hose reels	a licence under the *Plumbing and Drainage Act 2002* in the class plumber or water plumber—fire protection (hydrants and hose reels)
4	install and maintain a fire door or shutter	a technical qualification mentioned in schedule 2, part 16, section 3
5	install, maintain, inspect and test fire detection, alarm and warning systems extra low voltage	an electrical mechanic licence
6	inspect and test emergency lighting systems	an electrical mechanic licence

It is notable that, previously, work involving extra low voltage systems required an electrical mechanic licence (see row 5, above).

DEPW has conducted extensive consultation on fire protection licensing since 2015. In its submission to the Review dated 30 April 2021, DEPW noted a regulatory gap due to changes to the previous position:

> As part of developing the fire protection reforms, a concern was identified about an existing exemption in the Queensland Building and Construction Commission Regulation 2018, which provides occupational electrical mechanics licensed under the ESA need not hold a QBCC licence to work on extra low voltage fire alarm systems. It was identified that this exemption results in a small gap in terms of regulatory oversight of this work.
>
> Addressing this gap has been the subject of ongoing, high-level discussions. Stakeholders have indicated support for this work to be appropriately regulated in the future.

Noting this issue, DEPW then proposed the follow "pathways" forward in respect of necessary experience to conduct work:

> To demonstrate experience, it may be considered satisfactory for electrical mechanics to provide a statement from their employer about work they have previously carried out. An obligation could be placed on employers to provide the statement, if requested, within a specific timeframe, for example 21 days.
>
> It is suggested consideration could also be given to waiving fees for electrical mechanics seeking this broader scope of work, where the approval is sought within six months of commencement of any amendments. New entrants would need to pay the full licence fees.
>
> It is intended the QBCC will continue to regulate contractor licences for these fire alarm systems. From 1 May 2021, the new fire protection licensing framework will implement similar technical qualifications as outlined above for electrical mechanics seeking a contractor's licence.
>
> It is understood that a key focus of the ESA review is to ensure the relevance and effectiveness of provisions that determine what is encompassed by the duties and requirements of the electrical safety legislation in Queensland. It is considered the proposed amendments support this outcome, by aligning the legislation with existing industry practice and ensuring work by electrical mechanics can be appropriately regulated.

The DEPW submission makes clear that Electrical Mechanics are able to install and maintain ELV fire alarm systems under their ESO licence (and the Review agrees). This includes:

- fire detection systems
- emergency warning and intercom systems
- the inputs, outputs and controls associated with the above systems
- fire ventilation control systems
- monitoring systems and controls for fire suppression

- smoke and heat alarm systems and devices.

However, the DEPW submission lists a number of competencies from the UEEE training package and makes the point that Electrical Mechanics could be required to show they have the experience in this type of work. This includes:

- Install fire detection and warning system apparatus UEEEC0041
- Verify compliance and functionality of fire protection system installations UEEEC0076
- Enter and verify programs for fire protection systems UEEEC0026
- Install and maintain cabling for multiple access to telecommunication services UEEDV0005
- Prevent ozone depleting substance and synthetic greenhouse gas emissions CPPFES2043A
- Repairs basic electronic apparatus faults by replacement of components UEEEC0060.

The "pathway" proposed by DEPW, i.e. that employers be compelled to provide a statement about the work the Electrical Mechanic had previously carried out, seems impractical to the Review. The Review instead suggests that at the time of making any legislative change informed by Recommendation 7, any and all Electrical Mechanics working in the fire protection industry are deemed competent to continue to undertake the full scope of fire protection work. The Review also notes the practicality of on-the-job familiarisation concerning the non-electrical aspects of fire protection work. The overall picture is one in which it appears unnecessary to require licenced electrical workers to undertake additional training requirements.

The Review is of the opinion that electrical workers have the necessary competence to perform fire protection equipment installation work. Importantly, prior to the recent QBCC reforms, electrical license holders were accustomed to carrying out fire protection work under the previous licensing framework. The Review has carefully considered how to navigate this situation while avoiding duplication and an unnecessarily complex regulatory environment. Two options present themselves.

First, as noted above under section D, the Review is recommending that relevant fire protection equipment be defined as "electrical equipment", notwithstanding it is "extra low voltage" (Recommendation 4). Should Recommendation 4 be given effect, the consequence for the definition of "electrical work" would mean electrical workers are permitted to carry out fire protection installation and maintenance work. Should any particular adjustment be required, the definition of "electrical work" could be amended to specifically exclude and include forms of work. This option is reflected in Recommendation 9.

Alternatively, the Act could be amended to deem licensed electrical workers competent to carry out the electrical components of fire protection equipment-related work, reflecting historical practice. Ideally, the regulatory role of the QBCC would operate seamlessly with the regulation of electrical worker by waiving fees for those electrical workers licensed by the ESO, applying for occupational fire protection licences administered by the QBCC. This option is reflected in Recommendation 9.

Recommendation 9: It is recommended that the electrical aspects of fire protection work are recognised as "electrical work", notwithstanding equipment being "extra low voltage", either via the implementation of Recommendation 4or a specific amendment to the definition of "electrical work".

Maintenance of smoke alarms

In Queensland in 2017, a requirement for interconnected smoke alarms was introduced. Interconnection can be achieved by battery powered smoke alarms using Bluetooth or other methods, or through integration into the electrical installation through hard-wired, interconnected smoke alarms. Currently there is no licensing requirement for the cleaning or testing of smoke alarms, however there is a legal requirement to test and clean each smoke alarm in a dwelling every 12 months. Guidance material produced by the Queensland Fire and Emergency Services recommends testing as regularly as once a month.

Due to a mixture of hardwired installations and smoke alarms being interconnected by other methods, there is a risk that unlicensed individuals may inadvertently come into contact with live electrical parts by removing the cover to clean the alarm. This places the individual at risk of electric shock. The Review considered the fundamental issue to be the competence of the person removing the cover to clean the hardwired alarm, in addition to the general public's understanding of electrical safety and ability to distinguish between alarms.

The review canvassed a number of potential options to respond to the issue, including introducing a labelling system for hard wired smoke alarms, a requirement for only licensed electrical workers to maintain hard wired smoke alarms and a community awareness campaign to raise the awareness of the general public. Noting the ubiquitous nature of smoke alarms, the Review considered a multifaceted approach would be most appropriate in responding to this issue. A public awareness campaign and labeling system for hard wired smoke alarms is considered a proportionate approach to raise the awareness of the general public. It was considered that the introduction of a requirement for licensed electrical workers to perform maintenance on hard wired smoke alarms is also proportionate to the risk and addresses the issue of competency.

Recommendation 10: Ensure all hardwired smoke alarms are labelled on the cover to identify that it is electrical equipment and should only be maintained by a licensed electrical worker, and
(a) it is recommended that the Electrical Safety Office undertake a community awareness campaign to make the general public aware and promote electrical safety throughout Queensland.

F. Purpose of the Act and regulation making powers

To this point, consideration of ensuring the contemporary nature of the definitions of "electrical equipment" and "electrical work" have been specific in nature. The recommendations made aim to clarify the scope of those terms, through the plain words of their definitions. However, interpretation occurs in context and with a view to the purpose of the Act. Therefore, it is also necessary to consider ensuring the scope of the

Act is sufficiently broad in its purpose, as well as its regulation-making powers. More specifically, it is crucial to ensure the purpose of the Act and the powers to make subordinate legislation are broad enough to enable regulations to be made as new technologies and new applications of existing technologies arise that pose a risk to community safety.

Purpose of the Act

Regarding the purpose of the Act, the concept of ensuring "community safety" was raised with the Review for inclusion, along with the ELC advocating the inclusion of "ensuring consumer protection" or similar. The concept of consumer protection relates to and is taken up for further discussion in Chapter 7 of this Report, which is dedicated to the topic of electrical safety duties (rather than the core definitions that give rise to duties). Ultimately, the precise wording of the purpose section of the Act is not a matter for a review of this kind to rigidly stipulate. The precise wording is a matter for legal experts to consider, particularly the Office of the Queensland Parliamentary Counsel. Regarding intent, combined with changes to core definitions, the result envisioned is enhancing electrical safety through the ability to make regulations that are responsive to emerging changes in the electrical industry and society more broadly.

Regulation-making powers

The current regulation-making powers provided to the Governor in Council under the Act are set out in section 210, contained in the miscellaneous provisions of Part 14A. The regulation-making power is first stated plainly (s 210(1)), and then without limiting the scope of the general power, via a list of 21 specific topics that a regulation may prescribe (s 210(2)). The Review has not identified a gap in these powers, but recommends further consideration, particularly in conjunction with the implementation of Recommendation 3. That is, the precise legal approach to expanding "electrical equipment" to include ELV equipment may be assisted with a specific power in section 210.

Recommendation 11: Ensure the purpose of the Act is broad enough to establish an electrical safety framework able to remain responsive to the risks of new technologies as they arise, considering the inclusion of the purposes of "community safety" and "consumer protection".

Recommendation 12: Evaluate existing powers to make subordinate legislation and amend the Act as required to enable regulations to be made with respect to new technologies and methodologies that pose an electrical safety risk, as those technologies arise (Act s 210).

6.4 Incident definitions

Among the core definitions found in the interpretation sections of Part 1 of the Act are two terms encompassing failures to ensure electrical safety. These terms will be referred to as the "incident definitions", or simply "incidents". The two definitions are cast at different levels of gravity. The most serious is suitably titled "serious electrical incident" and includes incidents in which a person is killed by electricity, as well as shocks treated by a doctor and high voltage shocks whether treatment occurs or not (Act, s 11). The

second definition is “dangerous electrical event”, which covers six different electrically unsafe situations, including what can be referred to as near misses, significant property damage, unlicensed electrical work, defective electrical work, and electrical equipment not marked as it should be under the Act (Act, s 12).

While the Act defines these two kinds of incidents, the Regulations set out the relevant duties arising from them. First, a general duty is placed on PCBUs to eensure the Regulator is notified when an incident arises out of the conduct of the business or undertaking (s 265). A duty to ensure the incident site is not disturbed is placed on the person with management or control of that site (s 269). More involved duties are placed on distribution entities (ss 266-8, 270-1), being entities that supply electricity using a supply network within its distribution area (*Electricity Act 1994,* ss 37-8).

As part of the conduct of the Review, stakeholders have raised suggestions both in relation to the incident definitions, as well as in relation to duties arising from them. Some of these changes advocated can effectively be achieved as a consequence of broader reforms to the definition of “electrical equipment”, for the reasons explained below.

Renewables and emerging technologies

The first issue raised by stakeholders for consideration is the relationship between incident definitions and emerging technologies. It is clearly desirable to ensure that where emerging technologies give rise to incidents, they are not unintentionally excluded from relevant definitions under the Act and therefore from the duties under the Regulations. More specifically, where emerging technologies results in death or shock of certain kinds, as well as near misses, etc. the normal reporting and response mechanisms established by the Regulations should apply.

Currently, the scope of causes of a serious electrical incident centre around the concept of that incident “involving electrical equipment”. Automatically, then, if the Act’s definition of “electrical equipment” captures emerging technologies, and an incident arises from an emerging technology, the incident reporting and other requirements will apply without need for further legislative amendment. While the definition of “Dangerous Electrical Event” is more involved, including alternative definitions, they are based on the same core concepts of “electrical equipment” and “electrical work”. Therefore, subject to the acceptance of some or all of the previous recommendations of this report, incident definitions will remain contemporary. Given the structure of the Act and Regulations, this is true more broadly.

On-grid and off-grid contexts

A related issue concerns the distinction between electrical equipment connected to the grid and so-called “off-grid” electrical equipment. The ESO has advocated for ensuring incidents in the off-grid context are caught by incident definitions and therefore duties related to incidents. Again, given the concepts of “electrical equipment” and “electrical work” are central to the incident definitions, capturing those concepts depends on how the higher-level concepts are defined.

Currently, the definition of "electrical equipment" in s 14 does not refer to or depend on the presence or absence of a connection to the grid. Whether or not the electrical equipment is on-grid or off-grid appears to be irrelevant to the definition. As the incident definitions apply to all "electrical equipment" without making distinctions for certain forms (other than high voltage electrical equipment in some of the definitions of dangerous electrical event), the Review is of the opinion that off-grid electrical equipment is already caught by the incident definitions. If, for example, in the conduct of a business or undertaking involving an off-grid solar system, a person receives a shock from electricity at the business' premise and is treated by a doctor for that shock, the situation already falls within the scope of current incident definitions and duties.

If, however, one casts the issue as *awareness of* application to off-grid electrical equipment, there are potential legislative and non-legislative responses to consider further. One approach could involve a "note" under the definition of electrical equipment to the effect that whether the electrical equipment is on-grid or off-grid is immaterial. Another approach is for the ESO to communicate off-grid applicability to stakeholders via whatever means it views as most effective. Finally, both legislative and non-legislative approaches could be adopted.

Recommendation 13: Clarify that off-grid systems are captured within the meaning "electrical equipment" and are therefore within the definitions of Serious Electrical Incident and Dangerous Electrical Event (Act, ss 11-12), giving rise to duties to notify the Regulator and otherwise respond to such incidents (Regulations, Part 14).
(a) Consider creating an awareness campaign to ensure stakeholders understand the off-grid applicability of incident and event-related notification requirements.

General clarifications

The incident definitions themselves contain a number of terms highlighted by multiple stakeholders as in need of clarification. Terms that effectively determine the scope of SEI and DEE, such as "treated" (in the sense of medical treatment for electric shocks) and "significant property damage", are the main candidates for clarification. SEI is defined as (underlines added):

> … an incident involving electrical equipment if, in the incident—
> (a) a person is killed by electricity; or
> (b) a person receives a shock or injury from electricity, and is <u>treated</u> for the shock or injury by or under the supervision of a doctor …

The CEC suggested the current definition of SEI may deter people from seeking medical assistance. The perverse outcome would involve a deliberate attempt to avoid falling within the category of an SEI and therefore reporting duties arising from it. The Review is not aware of evidence of such a practice but shares the CEC's concern. The CEC recommended that "is treated for the shock or injury under the supervision of a doctor" be removed from the SEI definition, in line with federal WHS legislation. In contrast, EQL recommended the alignment of "treated" with the definition for "medical treatment" in existing OIR material. Stanwell also sought clarification of the terms "treated" and "supervision" by a doctor, including what is not deemed treatment.

Beyond this definitional matter, EQL advocated for a definition of the term "significant property damage", in order to better delineate the scope of a SEI. Powerlink sought clarification of the definition of "shock", noting under the current definition there is a potential lack of clarity regarding treatment of an electric shock. For example, a shock from an electric fence could be considered no more than a nuisance but may fall into an incident definition. Stanwell requested supporting examples in both low and high voltage scenarios for both DEE and SEI definitions. Stanwell requested clarification of low voltage shock by reference to currents as well as voltage, in addition to high voltage shock reporting requirements. Aurizon suggested the definition of SEI could incorporate extra low voltage exposure, because of an increase of new technologies operating at these voltages. Aurizon also suggested the definition of DEE be reviewed to better consider/incorporate low voltage and extra low voltage events.

With a significant number of stakeholders seeking clarification of definitions of key terms used in both the SEI and DEE definitions, it is considered necessary to respond, by aiding stakeholders' understanding and thereby appropriate and accurate reporting of incidents.

Recommendation 14: Clarify the definitions of "serious electrical incident" and "dangerous electrical event" by adding examples for different levels of voltage, including ELV (considering Recommendation 4), and clarifying terminology used in those definitions such as:
(a) considering replacing the term "doctor" with standard national law terminology – "medical practitioner" (s 11(b)-(c))
(b) specifying what it means to be "treated" by a doctor/medical practitioner, including what is not deemed "treatment", as well as what is meant by "supervision" (s 11(b)-(c))
(c) specifying a threshold for "significant property damage" (s 12(c)).

6.5 Other definitions

Beyond core and incident definitions, a number of other definitional matters were raised with the Review.

A. Testing and "live work"

The review has considered providing greater clarity as to the status of testing as "live work". Live work, or electrical work on energised electrical equipment, is permitted in particular circumstances under section 18 of the Regulations but is otherwise prohibited (section 14). An example of a circumstance permitting live work is where it is necessary for life-saving equipment to remain energised and operating while electrical work is carried out (s 18(1)(a) Example 1). Section 18(2) addresses work to test electrical equipment, stating [underlines added]:

> "The electrical work that may be carried out under subsection (1)(a), (b) and (d) may include testing of the energised electrical equipment."

The use of "may" twice creates doubt as to the intent of this sub-section, which appears not to provide certainty as to the status of work to test electrical equipment as "live work" or otherwise.

The practical consequence of falling within the definition of permitted live work is the need to follow some "preliminary steps" set out in section 19, which can be summarised as: (a) conducting a risk assessment, (b) ensuring the area is clear of obstructions, (c) identifying the point of disconnection or isolation, and (d) consulting with the person with management or control of the workplace.

The relationship between testing and live work was found to be a source of confusion for many during consultation. Numerous stakeholders sought clarity on the issue and the Review considered the issue pertinent to safety of electrical workers. NECA members sought clarification on the definition of live work particularly in relation to what live work could be performed, including testing and what level of protection was required to conduct this work.

Where there is confusion regarding electrical safety there is risk. Noting the confusion raised throughout the consultation process, changes to clarify that testing is live work were considered a necessary recommendation to rectify the current confusion. It is considered that these changes will ensure workers can understand the relationship between testing requirements and live work and ensure they are afforded the necessary and appropriate protections under the electrical safety legislation.

Recommendation 15: Provide greater clarity by stipulating that testing electrical equipment is deemed a form of live work (Regulations, Division 1) to address the lack of understanding and awareness.

B. Supervision of apprentices and unlicensed workers

Supervision is a highly significant concept within the framework of the Act. It is relevant to the central concepts of electrical work (section 18) and licensing (section 55). Section 55 sets out requirements for electrical work licences. Subsection (1) states that a person must not perform or supervise electrical work without an electrical work licence in force under the Act. Subsection (3) sets out exceptions, wherein a person is not required to hold an electrical work licence for the purpose of performing or supervising work in certain situations.

Section 18 contains the meaning of electrical work, first by establishing a broad meaning at subsection (1) and then by excluding certain kinds of work in subsection (2). The word "supervision" appears in sub-sections (2)(e), (g), (i) and (l), as part of establishing that the specific kinds of work mentioned therein are not considered "electrical work" when done under supervision. In sub-section (2)(g), the qualifying term "direct" is used in front of the word "supervision".

Separately, the Regulations explicitly introduce the concept of a "level of supervision". Section 279, covering a PCBU's duty to supervise a "training person" at subsection (3) states that a PCBU must "ensure that a training person who performs electrical work is supervised at all times by a licensed electrical worker licensed to perform the work". Subsection (4) states the "level of supervision" required under subsection (3) must be appropriate having regard to the type of work, training and competency of the training person.

The ETU advocated for an explicit definition of "supervision" in the electrical safety legislation. In fact, Schedule 2 of the Act (Dictionary) currently defines "supervise" as "***supervise***, electrical work, means supervise the way the electrical work is performed". While a definition exists, this definition simply repeats the word "supervise" rather a useful gloss. As such, the ETU's suggestion for an *explicit* definition is understandable. At present explicit levels of supervision are not set out in the Act or Regulations, though the Act already uses the qualifier "direct" in section 18. In practice, however, there are three recognised levels of supervision: direct, general and broad. These categories are found in use across Australian jurisdictions, including in Victoria and Western Australia, and the ESO has published guidance material on "Supervising electrical apprentices" based on the three categories of direct, general and broad supervision. It is the opinion of the Review that explicitly including these levels of supervision within legislation will assist with the practical fulfillment of duties regarding supervision, particularly in relation to "training persons", more colloquially known as apprentices. The current ESO guidance has formed the basis for the Review's proposed, explicit definition of supervise.

Direct supervision in certain circumstances

The ETU also suggested a minor change to the definition of "electrical work" that relates to supervision. As a starting point, "electrical work" is defined to include those forms of work set out in section 18(1). However, this broad definition is limited by exceptions to the rule listed in section 18(2). One of the exceptions is for "building or repairing ducts, conduits or troughs (channels) where electrical wiring will be or is installed." However, this exception only applies if certain conditions exist, including, at section (18)(2)(e)(iii), that "the work is done under the supervision of a person licensed to perform electrical installation work". The ETU viewed this reference as insufficiently clear and requested the addition of the word "direct" before "supervision". The review is of the opinion that this addition, following on from a definition of "supervision" explicating broad, general and direct kinds, will aid both understanding and ensure appropriate safety standards are upheld.

Removing the licence exemption for teachers supervising students' electrical work

The ETU has also suggested amending section 55(3)(g), which is an exception to the rule of requiring an electrical licence in order to supervise electrical work. The ETU believe a licence is required in this context, namely when supervising electrical work as part of training at an educational institution. This could be achieved simply by deleting section 55(3)(g), which would remove the exception and require a licence for this kind of supervision. The benefits of such a change would ensure – rather than assume – the continued competence of the person to perform electrical work over time.

Recommendation 16: It is recommended that the three levels of supervision be defined in the legislation by explicitly including the three recognised levels of supervision – direct, general and broad, as follows:

Direct means constant in person monitoring by the licensed electrical worker, who remains within sight and/or earshot of the work being carried out by a person directly assisting the licensed electrical worker in conducting electrical work.

General means for a person directly assisting the licensed electrical worker in conducting electrical work, the licensed electrical worker is available in the same work location for in person assistance or instruction as needed.

Broad means occasional in person contact at intervals during the day determined by the licensed electrical worker, for a person assisting the licensed electrical worker.

Recommendation 17: Consider clarifying miscellaneous requirements related to supervision, by:

(a) inserting the word "direct" before "supervision" in section 18(2)(e)(iii); and

(b) deleting the exception to holding a current electrical license for teachers supervising the electrical work of students (s 55(3)(g)), thereby requiring teachers to hold a current electrical license; and

(c) requiring direct supervision for a person directly assisting the licensed electrical worker in the laying, cutting or sealing underground cables that are part of the works of an electricity entity before the initial connection of the cables to an electricity source (s 18 (2)(j)).

C. Safety observers

Part 3 of the Regulations covers the broad topic of "Electrical work". Division 1 is dedicated to "Electrical work on energised electrical equipment". Section 22, titled "How work is to be carried out", requires (subject to some exceptions) the presence of a "safety observer" (sub-s (1)(c)). Exceptions are listed in sub-s 22(4) as:

> (a) the work consists only of testing; and
> (b) the person conducting the business or undertaking has conducted a risk assessment under section 19 (1)(a) that shows that there is no serious risk associated with the proposed work.

Further, sub-section 22(4) provides an example of an exception situation, namely "A safety observer is not required to observe the testing of the polarity of an installed outlet if a risk assessment does not show there is a serious risk in performing the work."

Safety observers are also referenced in other sections of the Regulations, and finally in the dictionary at Schedule 9. There, "safety observer" is defined as:

> (a) generally, for electrical work, means a person who—
> (i) is competent—
> (A) to implement control measures in an emergency; and
> (B) to rescue and resuscitate a worker who is carrying out the work, if necessary; and
> (ii) has been assessed in the previous 1 year as competent to rescue and resuscitate a person; or

(b) for schedule 2, for the operation of operating plant, means a person who—

(i) observes the operating plant; and

(ii) advises the operator of the operating plant if it is likely that the operating plant will come within an exclusion zone for the operating plant for an overhead electric line.

The Regulations at section 68 set out a PCBU's duties with respect to overhead or underground electric lines. Specifically, that duty set out at subsection (1) is to ensure no person, plant or thing at the workplace comes within an unsafe distance of the lines. Subsection (2) allows, if that is not reasonably practicable, for a risk assessment to be conducted and control measures put in place consistent with the risk assessment (and any requirements of an electricity entity).

The ETU has expressed concern that the requirements of subsection (2) are too lax, and that a safety observer should be required when PCBUs undertake work near exposed live lines in preference to other control measures. Given the evidence of continued contact with overhead lines leading to serious injury and loss of life in Queensland, the Review is of the opinion that this simple and effective measure should be adopted.

Recommendation 18: Consider implementing expanded requirements for safety observers to encompass situations in which:
(a) work includes testing, as a form of live work, by amending the current exemption in the Regulations, section 22(4)(a); and/or
(b) work is undertaken near exposed live lines, in addition to the current requirements for a risk assessment informing other control measures, required in the Regulations, s68(2).

Recommendation 19 Consider amending the definition of safety observer to require a safety observer maintains currency of competence in rescue and resuscitation and the non-accredited course – "provide support to an electrical tradesperson" (RIISAM214A) or equivalent as determined by the Regulator (Schedule 9).
(a) that training should be undertaken prior to acting as a safety observer and refreshed every 12 months.

6.6 Further issues and recommendations

A number of miscellaneous matters concerning definitions have been raised with the Review through a combination of external stakeholder submissions and compiled departmental issues register (see 4.4). Each matter is briefly summarised below, prior to a recommendation in respect of those matters.

(a) *Prescribed entities*

Section 233 of the Regulations defines "Prescribed electricity entity" largely by reference to Schedule 6. Part 1 of Schedule 6 lists nine "Original prescribed electricity entities": Airtrain Citylink Limited, Aurizon Network Pty Ltd, Energex Limited, Ergon Energy Corporation Limited, Essential Energy, Powerlink Queensland, Queensland Rail Limited,

RTA Weipa Pty Ltd, and the Authority under the *Queensland Rail Transit Authority Act 2013*. In addition, Part 2 of Schedule 6 covers "Later prescribed electricity entities", of which there are currently none.

In addition to reference to Schedule 6 of the Regulations, section 233 also refers to the sub-section (c) definition of "electricity entity" in Schedule 2 of the Act, which provides (underlines added):

> ***electricity entity*** means—
> (a) a generation entity, transmission entity or distribution entity; or
> (b) a special approval holder that is authorised under the Electricity Act to do something that a generation entity, transmission entity or distribution entity may do under that Act; or
> (c) a railway manager, or light rail manager for a light rail, that is exempted by the Electricity Act, section 20Q or 20QA, from the requirements of section 88A of that Act; or
> (d) the Authority under the *Queensland Rail Transit Authority Act 2013*; or
> (e) Airtrain Citylink Limited ACN 066 543 315.

The relevance of falling within the definition of "Prescribed electricity entity" is made clear in Part 5 of the Act, which concerns "Safety management systems for electricity entities". Therein, section 67 requires a prescribed electricity entity to have, and give effect to, a safety management system (**SMS**) for the entity. A SMS is defined in section 66 of the Act, with further details set out in Part 11 of the Regulations. In summary, a SMS is a written document detailing hazards and risks associated with design, construction, operation and maintenance of works, how the hazards and risks are to be managed, as well as other compliance matters.

The Review is of the opinion that large-scale generation in particular can no longer be considered the province of a limited list specific entities. Generation has become too diverse and autonomous for that singular approach. SMS requirements should apply to large electricity generation operations, including large-scale gas generators, solar farms and wind farms. Insofar as a SMS is a document tailored to particular operations, specifically their risks and hazards, the document should not be considered particularly onerous. The less complex the operations, the less complex the document. As such a SMS can be implemented proportionate to the scale of the generator's operations.

Consideration of further reforms related to electricity entities and SMSs are considered at 10.7(E) and (G) of this report, respectively.

(b) *Hazardous atmospheres*

Beyond the general definition of "electrical equipment" as equipment involving voltage greater than extra low voltage (s 14(1)(a)-(b)) is the first exception to this rule. Sub-section 14(1)(c) provides as a definition of electrical equipment:

> [equipment that] is part of an electrical installation located in an area in which the atmosphere presents a risk to health and safety from fire or explosion.

The sub-section makes no reference to voltage and therefore captures extra low voltage equipment. When inserted into the Act in 2004 via the *Workers' Compensation and Rehabilitation and Other Acts Amendment Act 2004*, the Explanatory Notes provided:

> *The clause includes extra low voltage equipment in hazardous areas within the meaning of electrical equipment. In ordinary circumstances, extra low voltage (ELV) equipment presents no electrical safety risk. However, if this equipment is located in a hazardous area (an area likely to contain an explosive atmosphere such as a fuel refinery) a small spark or arc can initiate an explosion. In including this equipment the clause ensures this equipment is covered by the electrical safety framework provided by the Act.*

The explanatory notes provide some context on the risks in question. In particular, and consistently with the current Code of Practice on Confined Spaces, fire or explosion requires the presence of three elements: (1) air, (2) a fuel (gas, vapour or mist), and (3) an ignition source. An atmosphere becomes potentially flammable/explosive if the amount of fuel exceeds a certain degree of its lower explosive limit. If an ignition source, such as a sparking electrical tool, is introduced into a space containing a flammable/explosive atmosphere, an explosion is likely to result.

This context helps to begin to clarify a historically re-occurring query made to the ESO concerning the interpretation of what can be referred to as the "hazardous atmosphere" definition of "electrical equipment". Specifically, the definition refers to an "area" on the one hand, and to an "atmosphere [that] presents a risk" on the other hand. The concept of an "area" is fixed and unchanging, whereas the concept of an "atmosphere" is one that changes over time. The juxtaposition of these concepts gives rise to a practical question that can be expressed in different ways: *Does the "atmosphere" have to exist at the time of the work? Is the atmosphere one that generally but not always characterises the area? Or, even, is the atmosphere one that* might *arise in the future even if it does not exist at the time of the work?*

The reality of real-world situations, or "areas", is a changing profile of risk with a changing profile of "atmosphere". For example, a well bore that might generally contain gas, might not do so at the point in time where electrical work is to be carried out. In such a case, should we interpret the section by emphasising the *atmosphere* at the point in time, or the *area* as generally characterised? Examples of risks that may not exist at the time of the work, but may exist later include a fuel in the form of a gas that has leaked at a point in time, the use of a flammable cleaning solvent at a point in time, or a lack of oxygen at a point in time (Electrical safety code of practice 2021 - Managing electrical risks in the workplace).

Given the complexity of the real-world application, the Review recommends that the "hazardous atmosphere" definition of electrical equipment be clarified, including its temporal operation with changing atmospheres.

(c) *Electrical work and AS/NZS 3000 and AS/NZS 3008*

An issue was raised by the ESO during the Review process whereby work carried out to AS/NZS 3000 and AS/NZS 3008 is currently within the definition of an engineering

service. This is evidenced by a court case that ruled licensed electricians cannot perform all the work set out in AS/NZS 3000. Specifically, certain design work such as calculating a cable size may be only the province of engineers.

This comes after amendment to the *Professional Engineers Act* which previously quoted AS/NZS 3000 as a standard that if work was carried to, the work was not that of an engineering service, and implicitly was work that could be carried out by an electrician. However, it has recently been amended to remove the reference to AS/NZS 3000. This allowed the court to be able to conclude that some of the work in AS/NZS 3000 must only be carried out by an electrical engineer.

A suitable remedy to this issue was identified by the Review as an amendment to the definition of "electrical work" (section 18, theAct) to stipulate that licenced work includes any work carried out to AS/NZS 3000 and AS/NZS 3008.

(d) *"Performance of work" and "performance of electrical work"*

During the Review the ESO raised the absence of a definition explaining the difference between "the performance of work" in contrast to "performance of electrical work". Understanding the contrast is key to understanding and complying with s56 (3)(b) of the Act.

Section 56(3)(b) stipulates a PCBU does not conduct a business or undertaking that includes the performance of electrical work only because the person contracts for the performance of work that includes the performance of electrical work if the electrical work is intended to be subcontracted to the holder of an electrical contractor licence who is authorised under the licence to perform the electrical work. The distinction between the "performance of work" and "performance of electrical work" should be clarified. This should provide adequate distinction between the two terms noting that "performance of work" is intended to provide for work that may include electrical work however is only one component of a greater piece of work. Correct interpretation of the two phrases will ensure a clear understanding of the circumstances in which an electrical contractor licence is required. It is therefore recommended to clarify the meaning of "performance of work" in contrast to "performance of electrical work" (s 56(3)(b)).

Recommendation 20: Consider clarifying the meaning of miscellaneous terms found in core definitions of the Act and Regulations, to ensure stakeholder understanding and appropriate scope.

Specifically, within the Act, it is considered that further clarification is required in relation to:
(a) the definition of a "prescribed entity" generally via characteristics, other than listed entities (Regulations, ss 6, 233)
(b) the meaning of "an area in which the atmosphere presents a risk to health and safety from fire or explosion", to assist with straightforward application to real world situations (s 14(1)(c))
(c) the relationship between AS3000 and AS3008 and the definition of "electrical work" (s 18)

(d) the meaning of "performance of work" in contrast to "performance of electrical work" (s 56(3)(b)).

Chapter 7: Ensuring effective duties

Part 2 of the Act covers the topic of electrical safety duties. Its five divisions in turn cover introductory matters, duties of care, offences and penalties, ministerial recall orders, and ministerial notices and codes of practice relating to electrical safety duties. Given the complexity of Part 2, it will be useful to first summarise the contents of its five divisions.

Summary of divisions on duties

Division 1, covering introductory matters, first states principles that apply to duties: duties are not transferrable, a person may have more than one duty, and more than one person may have a duty concurrently. This division also sets out the meaning of "reasonably practicable".

Division 2, covering duties of care, sets out duties of electricity entities, designers, manufacturers, suppliers, importers, installers, and repairers of electrical equipment, as well as businesses generally, officers, persons in control, workers and "other persons".

Division 2A, covering offences and penalties, establishes offences for reckless conduct (category 1), failure to comply with an electrical safety duty exposing a person to a risk of death or serious injury or illness (category 2), and a failure to comply with electrical safety duty generally (category 3). Offences and penalties are discussed within this report at 9.2, which covers the topic of enhancing compliance.

Division 2B, covering ministerial recall orders, allows the Minister to make an order for a designer, manufacturer or imported to recall stated electrical equipment, where the Minister considers that equipment places a person or property in electrical risk. The division sets out requirements for recall orders, including notification specifics.

Division 3, covers the topic of making ministerial notices and codes of practice about discharging electrical safety duties. The status of codes of practice is considered separately in Chapter 8 of this Report (at 8.1), concerning alignment with work health and safety legislation. This Review does not otherwise delve into the minutiae of current codes of practice. Given that codes of practice reflect and provide practical guidance on fulfilling duties set out in the Act and Regulations, any necessary amendments to specific codes of practice will naturally follow on from the acceptance of any recommendations concerning electrical safety duties and their implementation in the form of Act and Regulation amendments.

In summary, the present chapter focuses on the topics of electrical safety duties and ministerial recall orders (Divisions 1, 2 and 2B), with codes of practice considered in Chapter 8 and offences and penalties considered in Chapter 9 of this report (Divisions 2A and 3).

7.1 Electrical duties and requirement

The electrical duties and requirements in the Act underpin the standards across the entire electrical safety framework in Queensland. As such, it is not surprising that the Review received significant input from stakeholders on this topic. One theme was the complexity of the current regime. Beyond that observation, and indeed prior to the Review commencing, the Commissioner's Report identified concerns about the adequacy of duty provisions. Recommendation 8 of the Commissioner's Report proposed that the adequacy of certain duties be canvassed, including duties of suppliers and consumer protections.

7.2 Enhanced duties

Enhanced accountability in the chain of responsibility

Beyond clarifications to duties to aid stakeholder understanding of and compliance with existing duties (see 7.5, below), the Review has considered enhanced import, design and manufacturing duties to ensure quality and compliant electrical equipment, including but not limited to solar panels. Strengthening requirements for importers and suppliers of electrical equipment to confirm they conform with the appropriate standard/regulation and are electrically safe prior to being available for sale, is a particular area of significance being considered by the Review.

Members of NECA advocated for better import, design and manufacturing laws to ensure only quality and compliant equipment is used. Members also expressed concern that the electrical safety legislation should extend legislative duties on importers, designers, manufacturers and suppliers of pieces of solar equipment.

The matter of enhanced duties was delegated for consideration by the Reviewer to the Manufacturing, Wholesale and Retail Working Group. Following deliberation and discussion of the issues, the working group made the following two recommendations: to introduce better import design and manufacturing laws to ensure quality and compliant electrical equipment with a particular focus on solar and strengthen requirements for importers and suppliers of electrical equipment to confirm they conform with the appropriate standard/regulation and are electrically safe prior to being available for sale.

Duties on importers, designers and manufacturers are key in ensuring that electrical equipment in its design is intrinsically safe and appropriate for use in Queensland. It was considered during the Review that current provisions in the legislation provided an opportunity for strengthening these requirements. Strengthening these requirements would afford further protections for the community consistent with the purpose of the Act, providing duties along the supply chain providing more opportunities to check electrical equipment such as solar panels is compliant before it reaches the worker and the consumer. A further consideration was duties on importers and suppliers. Where equipment is not conforming with the appropriate standards and regulations this poses a risk to Queensland workers and the broader Queensland Community. It was considered that an opportunity to strengthen these requirements should not be missed to ensure that electrical safety framework in Queensland remains rigorous and effective.

The adequacy of provisions relating to the chain of responsibility to ensure electrical equipment is conforming is another area being considered by the review. The review is of the provisional opinion that enhancements can be made to ensure equipment quality.

Clarifications are also potentially desirable to the relationship between electrical equipment standards and non-conforming building product (NCPB) standards administered by the QBCC.

MEA sought inclusion of aspects of NCBP legislation including chain of responsibility for electrical products. Similarly, members of NECA sought clarity on requirements to report the use of non-conforming electrical products to the Regulator. This issue was also raised with the Manufacturing, Wholesale and Retail Working Group for in-depth consideration. The Working Group discussed the issues over the course of three meetings and provided recommendations to the Reviewer to ensure electrical equipment includes aspects of the non-conforming building products legislation including implementing a chain of responsibility for electrical equipment and products, similar to QBCC legislation.

Where the QBCC administers legislation addressing NCBP it was raised during the Review that a gap remained relating to electrical equipment that is not regarded as a building product. In considering potential approaches to remedy this issue, the approach taken by QBCC was reviewed. It was considered that a similar approach as taken by QBCC to NCBP and the chain of responsibility should be recommended. This approach ensures greater accountability is taken along the chain of responsibility and sets out clear duties and requirements in relation to non-conforming electrical equipment.

Recommendation 21: Consider implementing enhanced regulation of the supply chain for in-scope electrical equipment by adopting additional duties found in "non-conforming building products" (NCBP) legislation, administered by the Queensland Building and Construction Commission, including consideration of:
(a) ensuring the product/equipment is safe as per the safety standard; and
(b) ensuring each level of the supply chain only passes on products with the required information for the product/equipment; and
(c) reporting requirements for licensed electrical workers when they encounter work employing non-conforming electrical products; and
(d) ensuring requirements to comply with recall orders extend throughout the supply chain and including in multiple jurisdictions.

In addition, consideration of expanded duties in relation to non-conforming electrical equipment to:
(e) empower the Regulator to require, on demand, the supplier of relevant equipment to provide that equipment for testing at no cost to the Regulator (s 184); and
(f) enabling the Regulator to impose a condition on a certificate of conformity (s 155(a)); and
(g) establishing prohibitive penalties for non-conforming electrical equipment; and
(h) clarifying the relationship between NCBP legislation scope and electrical safety requirements and legislation.

Recommendation 22: Consider strengthening requirements for importers and suppliers of electrical equipment to confirm they conform with the appropriate standard or Regulations, whichever is greater, and are electrically safe prior to sale.
(i) noting that the applicable standard or Regulations is that at the time of import or manufacture in Australia.

Recommendation 23: Consider enhancing the Regulator's powers to cancel responsible supplier registrations; for example, where the person is ineligible, overseas or interstate (Regulations ss 139-142).

7.4 Qualified Technical Persons

Qualified Technical Persons (**QTPs**) hold a special role in the operation of electrical businesses. Applicants for electrical contractor licenses are required to nominate a QTP as part of the process. This is to ensure a suitably qualified technical expert on electrical safety has oversight of the business operations. However, curiously, the role and duties of QTPs are not clearly spelled out in the Act or Regulations. The Review is considering the inclusion of explicit duties of QTPs in electrical safety legislation, as well as powers appropriate to the position. In addition, the Review is considering the introduction of a requirement that all businesses that employ electrical workers also must employ a Qualified Technical Person, such as breweries and sugar mills. Finally, the ability of QTPs working across several organisations and their abilities to adequately ensure safety of operations has been considered, with administrative means to respond to this challenge being considered.

Stakeholders including the Electrical Safety Board and Committees raised the opportunity to include the role and duties of QTPs in the legislation. It was suggested that there are currently documents produced by the Regulator regarding the roles and responsibilities of QTP, however unlike other duties it was not included in the legislation.

Queensland Rail similarly sought adoption of the Regulator's advice provided in the form of factsheets in legislation, noting that adopting relevant elements of the factsheet and electrical contractor guide would ensure the QTP framework is applied consistently across industries. Queensland Rail also sought the introduction of requirements for quality assurance or electrical works and supervision and verification of works by QTPs in the legislation.

The ETU noted that there is currently no requirement for a Qualified Technical Person in a business that employs electrical workers. The ETU sought a requirement for QTP in organisations that employs electrical workers to undertake electrical work as part of their business model. The ETU suggested that by introducing this requirement, it would ensure PCBUs meet their obligations under electrical safety legislation and raises the profile of electrical safety in Queensland.

Members of the NECA also sought the introduction of CPD requirements for QTPs, noting it was important that they continually update their skills and knowledge in line with existing and emerging technologies.

In order to ensure QTPs are able to perform the role as intended in providing oversight and ensuring that electrical contractors conduct business in a way that is electrically safe it is considered that appropriate powers should be provided to the position. Further to the allocation of powers the issue of consistent application of QTPs across industry was

raised during consultation, the allocation of explicit duties under the legislation for QTPs would ensure that a minimum standard across industry is maintained by QTPs.

A further matter raised in the Review was the absence of a QTP in businesses that employ electrical workers. It was considered that the role of a QTP, in providing oversight and ensuring that business is conducted in a way that is electrically safe would be appropriately applied in this context. This recommendation is intended to provide additional protections to electrical workers in workplaces where PCBUs are not electrically qualified, elevating the status of electrical safety and ensuring that PCBUs meet their duties. The Review considers the implementation of a threshold of workers to trigger the requirement of a QTP may be applicable in this circumstance to circumvent the potential unintended consequence of requiring a QTP when a single licenced electrical worker is employed. Consideration to this construct or alternative notions to avoid potential unintended consequences should be considered during implementation. Finally, it was considered that consideration should be given to administrative means to ensure QTPs working across several organisations are able to fulfil their duties effectively.

Recommendation 24: Consider including explicit duties of Qualified Technical Persons (QTP) in electrical safety legislation, as set out in current ESO guidance on the role of a QTP (as published on the WorkSafe website The role of the qualified technical person (QTP) | WorkSafe.qld.gov.au), requiring QTPs to:
(a) develop and implement a safe system of work, and review and update procedures; and
(b) ensure currency of worker competence and that scope of work is within a worker's current license scope and competence level; and
(c) ensure appropriate levels of supervision for all workers, including apprentices and trainees (recommendation 13); and
(d) annually arranging training and skills programs for workers, and regularly consult with workers on training needs; and
(e) advise the PCBU and workers on compliance matters, including Australian Standards, legislation, and codes of practice.

Recommendation 25: Consider introducing a requirement that all businesses that employ (non-contract) electrical workers also must directly employ a QTP.

Recommendation 26: Consider introducing administrative means to ensure QTPs working across several organisations can fulfill the duties of the position effectively.

7.5 Further issues and recommendations

Miscellaneous matters concerning duties have also been raised with the Review through a combination of external stakeholder submissions and compiled departmental issues register (see 4.4). Each matter is briefly summarised below, prior to recommendations in respect of those matters.

Scope of "importer"

The scope of the definition of "importer" was raised in the Commissioner's report on Electrical Safety whereby the report instructed that strengthening the duties of suppliers and consumers should be pursued as part of the Review, specifically the report recommended to clarify the scope of importer.

The Act places duties on a PCBU that imports electrical equipment however no definition is provided for the term "importer". The absence of a definition of importer was raised by ESO as part of the Review. Particularly it was sought for application in section 33 of the Act (Duty of person conducting business or undertaking that imports electrical equipment.) and in the context of the Electrical Equipment Safety Scheme (EESS). The term importer has significance in the application of the EESS, including application in key definitions such as "responsible supplier".

Under the EESS, the responsible supplier is the importer of electrical equipment being offered for sale in Queensland (for example this captures the first seller in Australia of equipment /the business in Australia who takes first possession of the equipment to then on-sell – which due to complex business structures may be two different entities). A definition of importer would provide clarity for the application of key duties under the Electrical Safety Legislation in Queensland which includes the EESS. It is key that the definition for importer is appropriate in accounting for the relevant person in a variety of complex business arrangements while simplifying the element of 'importing' as far as evidentiary proof is required to support enforcement outcomes.

During the Review the scope of the definition was discussed, it was noted that the definition should capture PCBUs importing electrical equipment however not capture importation for personal use as there is no duty under the legislation on an individual that is not a PCBU or working for a PCBU. It was raised that the definition should also consider complex ordering structures that may be implemented, this is particularly important in application for the EESS. There is significant risk in not considering these arrangements due to the barriers they pose to enforcement when unaccounted for. Complex arrangements are also known to occur using online platforms whereby the entity may not take payment or organize the delivery of the equipment however provide an online platform that allows for the purchasing of electrical equipment. It should be considered whether such arrangements are akin to service providers or if the platform contributes to the importation and therefore should be captured within the scope of an "importer". Noting the significant duty applied to importers under the electrical safety framework, to ensure products imported are electrically safe, it is recommended the meaning of importer is clarified to ensure the importer duty is clear in its application, capturing the appropriate parties and allowing enforcement to be effectively achieved where noncompliance is identified.

Recommendation 27: Clarify the meaning of "importer" for the purpose of ensuring the appropriate scope of duties to ensure products imported are electrically safe (s 8)

Chapter 8: Alignment with Work Health and Safety legislation

Queensland is the only model law jurisdiction in Australia to have legislation separate to the *Work Health and Safety Act 2011* (**WHS Act**) dedicated to electrical safety. However, electrical safety laws in Queensland were originally drafted to align with the state's work health and safety legislation, to ensure consistency in the application of health and safety standards.

Over the last two decades, amendments have been made to harmonise the two legislative frameworks in certain respects. Nevertheless, there remain areas of difference than can be considered for further harmonisation. Where standards are equal or higher in the WHS Act, or provide more practical guidance, the Review considered them for adoption in the Act.

The two core issues covered below were recommended for adoption by the Work Health and Safety Working Group, established under the Review's Industry Reference Group (see section 4.5, above). This group specifically considered issues of alignment between work health and safety legislation and electrical safety legislation.

8.1 Codes of practice

Codes of Practice are practical guides written to assist duty holders to achieve the standards required under the laws. At present there are codes of practice approved under both the Act and WHS Act. Following the Best Practice Review of the WHS Act in 2017, a series of regulatory amendments were made in response to the Review's recommendations. One of these changes was the introduction of a duty in the WHS Act requiring PCBUs to either:

1. comply with an approved code of practice, or
2. manage hazards and risks arising from the work carried out as part of the conduct of the business or undertaking in a way that is different to the code of practice but provides a standard of health and safety that is equivalent to or higher than the standard required in the code.

Enshrining codes of practice in the legislation in this way ensured that codes of practice represent the minimum standard of health and safety required by industry and provided inspectors the ability to enforce codes of practice with certainty.

Conversely, the Act does not contain a duty for PCBUs to comply with codes of practice or use methods to achieve an equal or higher standard to that set out in the relevant code of practice. This legislative gap was identified by several stakeholders during consultation. Stakeholders noted the present review is an opportunity to elevate the status of electrical safety codes of practice to the same standard as those approved under the WHS Act.

The matter was referred to the Work Health and Safety Working Group for consideration. Members of the working group noted the approach taken in the WHS Act was more proactive and required industry to pay more attention to the codes of practice due to their elevated status. The group arrived at general consensus to make a recommendation to the

Reviewer to align the status of codes of practice under the Act with the WHS Act. This approach was also recommended in the Commissioner's Report at [8.3b].

During the public submission process Stanwell Corporation also noted it was comfortable with the linking of codes of practice within the legislation and already considers the codes of practice when developing or updating electrical processes and procedures.

Noting the approach taken by WHS Act creates a minimum standard of safety for industry and provides additional enforcement options for the Regulator where PCBUs are failing to meet the minimum standard, the Review recommends considering aligning the Act with the *WHS Act*. This approach elevates the status of electrical safety codes of practice and sets a rigorous minimum standard of electrical safety in Queensland.

Recommendation 28: Align the status of codes of practice made under the ES Act with the status of codes of practice made under the *Work Health and Safety Act 2011* (s 26A), requiring compliance with the code of practice or a standard equivalent to or higher than the standard required under the code of practice.

8.2 Health and safety representatives and officers

Health and Safety Representatives (**HSRs**) are nominated workers who are elected by members of their work group to represent the views of their work group in matters of work health and safety. HSRs consult with employers to help support good WHS outcomes. HSRs can make consultation more accessible, efficient and effective in the workplace. Division 3 of the WHS Act stipulates the process of election of HSRs, powers and functions of HSRs, dispute resolution and obligations of PCBUs in relation to HSRs.

Also contained in the WHS Act are provisions that provide PCBUs the ability to appoint a Work Health and Safety Officer (**WHSO**). Unlike HSRs, a person can only be appointed as a WHSO if they hold a WHSO certificate of authority. The WHS Act prescribes the functions and powers of WHSOs, in addition to appointment and general obligations for WHSOs both in the circumstance when the WHSO is also the PCBU and when the WHSO is not the PCBU. The appointment of a WHSO is also permissible as evidence that a PCBU has taken action to mitigate health and safety risks. The general functions of WHSOs are to investigate or assist in the investigation of any incidents that occurred at the business or undertaking, accompany and assist an inspector during an inspection of the business or undertaking and establish educational and training programs on matters relating to work health and safety. Further functions exist where the WHSO is not the PCBU, these include notifying the PCBU about work health and safety matters, hazard and risk identification, report writing to the PCBU regarding hazards and risks and notification responsibilities. The application of these roles in an electrical safety context was raised for consideration by the Work Health and Safety Working Group.

The Work Health and Safety Working Group discussed whether the roles could be duplicative with QTPs, with members noting the election and work group processes for HSRs distinguish the role significantly. It was questioned whether a HSR for electrical safety would be duplicative when HSRs already exist. Members raised that the presence of a HSR does not mean they are electrically qualified and therefore would not be

proficient at identifying electrical risks or advocating in relation to unsafe workplaces in that regard. The Review considers that electrical work is sufficiently unique and necessitates specialised knowledge in the form of electrical qualification to ensure competency when discussing matters in relation to electrical safety. The Review considers the most appropriate approach to address this concern would be through the replication of WHSO and HSR provisions in an electrical context in the electrical safety legislation. This approach ensures that electrical safety matters are discussed and raised by those who are competent and elevates the priority of electrical safety matters to that of WHS matters. It is proposed that this approach will lead to increased consultation around electrical safety matters and consequently improved electrical safety outcomes.

Noting the benefits of WHSOs and HSRs in the work health and safety landscape the Review is recommending the inclusion of equivalent provisions for WHSOs and HSRs in the Queensland electrical safety legislation. These inclusions will ensure that electrical safety matters in the workplaces are elevated to status of other WHS concerns. These mechanisms also recognise the individual nature of electrical risks and the importance of having an electrically qualified representative and delegated officer to operate in the electrical safety sphere in workplaces.

Recommendation 29: Consider including within the Act, provisions equivalent to Health and Safety Representatives (HSR) and Work Health and Safety Officers (WHSO) found in the *Work Health and Safety Act 2011*.

8.3 Further issues and recommendations

One further matter concerning alignment with WHS legislation has been raised with the review. The matter relates to the consultation and the coordination of duty holders who have a duty in relation to the same matter.

Duty to consult

There are often situations where people share responsibility for electrical safety to varying degrees. During the Review where it was noted that under the WHS Act, section 46 prescribes a duty to consult with other duty holders. This provision requires that if more than 1 person has a duty in relation to the same matter under the Act, each person with the duty must so far as it reasonably practicable consult, cooperate and coordinate activities with all other persons who have a duty in relation to the same matter. An equivalent provision is not provided under the current Act. This duty requires persons conducting businesses and undertakings to work together in a proactive and reciprocal way. Noting the importance of duty holders who share responsibility in the duties to consult and coordinate activities, the Review recommends that consideration be given to implementing a requirement for consultation between duty holders, analogous to requirements under the *Work Health and Safety Act 2011.*

Recommendation 30: Consider implementing a requirement for consultation between duty holders, analogous to requirements under the *Work Health and Safety Act 2011* (s 46). That is, if more than one person has a duty in relation to the same matter under the

Act, each person with the duty must, so far as is reasonably practicable, consult, cooperate and coordinate activities with all other persons who have a duty in relation to the same matter.

Chapter 9: Enhancing safety – competence and compliance

The final term of reference for the Review is broad – enhancing safety with evidenced-based reforms. Many issues have been raised by stakeholders that may fall under this heading. The Review has grouped these issues into two initial categories: (9.1) *enhancing competence,* (9.2) *enhancing compliance.* Resourcing is also considered in this context (9.3). Chapter 10 considers miscellaneous, specific regulatory issues under the "enhancing safety" term of reference.

9.1 Enhancing competence

A. Licences

The importance of ensuring electrical workers are enabled to become and remain competent to do their work safely cannot be over-stated. The benefits to the worker and the community are obvious. The corresponding risks are grave, including loss of life. Many stakeholder conversations have included some element of training or competence of those who perform electrical work as a means of enhancing electrical safety. As such, the Review has broadly considered appropriate:

- testing requirements for worker and contractor licences
- the best form of administration of testing
- Continuing Professional Development requirements for license holders, and
- license renewal testing.

<u>Assessment requirements</u>

In reviewing the Act, during public consultation, a question was posed to stakeholders to advise what changes they considered necessary to improve electrical safety in relation to electrical worker and contractor licenses. Through conducting interjurisdictional research, it was found licensing, in particular the testing requirements to gain a license varies across the jurisdictions. Of note in Victoria the testing approach is comprised of one theory and two practical examinations. The practical examinations test safe isolation and testing. The testing is based on the essential performance criteria from the Electrical Regulatory Authorities Council (ERAC).

In consultation with Energy Safe Victoria, Energy Safe Victoria advised that there is a 50-70% pass rate in Victoria under this license testing regime which is significantly lower than Queensland. This suggested the rigour of testing is higher in Victoria compared the paper system currently operated in Queensland.

With the Review seeking to enhance safety with evidenced based reforms, one key pillar of safety is the competence of licensed workers and contractors. Noting the increased rigour in the Victorian license testing approach it is proposed that Queensland should overhaul the license testing and introduce a new regime modelled off of the successful scheme in Victoria. It is proposed that increased competency ensured by an increased threshold of licence testing will enhance electrical safety in Queensland.

Recommendation 31: Explore assessment requirements for licences, including a requirement for satisfactory completion of one theory and two practical tests as part of an enhanced licence eligibility pathway for the electrical worker and electrical contractor licences.
Recommendation 32: Explore reforming occupational electrical licence eligibility with assessments to ensure licensees hold the technical and theoretical competency required to be eligible to apply for an electrical licence. Replicating the Victorian Electrical Licencing Assessment (ELA) approach.
(a) it is considered this licensing assessment may be developed by the Commissioner for Electrical Safety and Electrical Licensing Committee in conjunction with the Electrical Safety Office.

Assessment administration

Noting the recommendation to overhaul the Queensland licence assessment regime to model the approach taken in Victoria, the Review also considered how assessment would be administered under this proposal. Options considered included whether assessment should be centrally administered, much like Driver's licence testing in Queensland, or if it should continue to be administered by approved Registered Training Organisations (**RTOs**).

During consultation with representatives from Energy Safe Victoria, the Review was advised that testing administration in Victoria is conducted by RTOs. Energy Safe Victoria advised there are two approved testing authorities for the practical examinations and more for the theory component of the assessment.

In line with the Victorian approach, the Review considers it prudent to maintain assessment administration through approved RTOs. In considering this, the Review is cognisant that Queensland is geographically larger than Victoria, which presents greater challenges to the Regulator. If testing were to be administered by the Regulator, it would come at a significant cost given then geographical coverage required.

Recommendation 33: Enhance the role of assessment administration by creating an assessment section within the Electrical Safety Office that oversees, administers and audits a number of Registered Training Organisations authorized to conduct assessments

Continuing Professional Development (**CPD**)

External inquiries have touched on the adequacy of the current Queensland framework for electrical licensing in terms of ensuring competency, particularly for contractors. This includes the 2015 Inquest into the death of Jason Jon Garrels by the Office of the State Coroner and a subsequent review by KPMG for OIR.

CPD aims to ensure licensees maintain up-to-date technical skills and knowledge and keep up-to-date with technological advancements and changes to the working landscape. During consultation there was significant support for the introduction of a CPD scheme in the electrical industry in Queensland. MEA supported the introduction of CPD as a

mandatory requirement for electrical workers and contractors. NECA also expressed support for the introduction of CPD, particularly for the contracting sector. NECA sought the delivery of sound professional development and training opportunities that provide a cost-effective way to improve technical and organisational knowledge.

Noting stakeholders throughout the Review have viewed CPD as a good means of improving the competence of licence holders and external inquiries addressing the adequacy of Queensland's current framework for ensuring competency, it is proposed that a CPD requirement be introduced. Given the significance of this change, a phased approach should be taken, with an initially low points attainment requirement when compared to mature schemes, such as is administered for engineers by Engineers Australia. As the scheme matures it may be adjusted in later years based on experience.

To ensure that attainment is practicable, the final forms of a CPD program should not exceed a time investment of more than 20 hours per year, or 60 hours over three years. 20 hours represents a maximum time investment for any individual. If, for example, a person is both a QTP and QBP, the 20-hour annual requirement would satisfy both positions. In other words, duplication should be avoided so as not to place an unnecessary and unmanageable burden on an individual. 20 hours per annum is the upper limit for CPD attainment, rather than the minimum requirement.

Regarding CPD course content, it is considered necessary for electrical contractors to engage in development in four areas: technical, safety, business and leadership. For licensed electrical workers who hold a supervisory or management role, a maximum of 15 hours CPD per year is appropriate, across technical, safety and leadership components. Finally, for electrical worker license holders generally, a maximum of 12 hours CPD per year across technical and safety components is considered appropriate.

Recommendation 34: Consider the introduction of CPD requirements for all licence holders, phasing in a requirement at initially low points attainment threshold (recommended at 6 hours/year equivalent or similar), to be increased over a suitable period of time until full implementation is achieved over no more than two contractor licence periods (six years).
(a) It is considered that a full CPD program would not exceed a total of 20 hours CPD per year, or 60 hours each three-year licensing period upon full implementation. It is further recommended that for electrical contractors, professional development activities may include four areas of competence being technical, safety, business and leadership to ensure maintenance of competency across the scope of the licence; and
(b) for licensed electrical workers who hold a supervisory or management role, a maximum of 15 hours CPD per year across technical, safety and leadership; and
© and for electrical worker license holders, a maximum of 12 hours CPD per year across technical and safety in accordance with the maintenance of competency across the scope of the licence.

<u>License renewal assessment</u>

The licence renewal test in Queensland is known as skills maintenance. Currently workers are required to sit the licence renewal test within two years of licence renewal to ensure

competency. During the course of the Review the licence renewal test has been raised with a focus on its adequacy and effectiveness in its present form.

During consultation the ETU indicated the skills maintenance test was no longer effective in achieving the intended aim and instead was widely viewed as a refresher on how to use the rule book as opposed to a threshold of how to perform tasks safely and effectively. The ETU sought a review of the test and suggested this training could be developed by the electrical licensing committee. As part of their submission, it was submitted that the name of the assessment should also be transitioned from "skills maintenance" to "licence renewal assessment" given this more accurately reflects the expectations and outcomes of the renewal process. NECA raised that some of their members felt that a period of validity of 5 years for a worker's licence was too long and that a single year for electrical contractors was too short. NECA submitted that a 2- or 3-year licence renewal period would be a better fit.

Central to the purpose of the current skills maintenance assessment is ensuring competency of licenced workers. Where consultation suggested the assessment was no longer achieving the desired outcome, this demonstrates a need to review this vehicle for ensuring competency. In addition to reviewing the contents and delivery of this assessment it is proposed that the periods between licence renewal assessment is aligned with the terms of licences as issued by the Regulator which are proposed to be 5 years for electrical workers and 3 years for electrical Contractors. It is noted that a more rigorous framework for competency that would be provided by an updated licence renewal testing regime would allow for licence intervals to be extended in the instance of a contractor licence from a single year and maintained at five years for electrical workers.

Recommendation 35: Consider reforming licence renewals to include testing to ensure licensee competency has been maintained through the licensed period, including by considering the following amendments:
(a) empowering the Commissioner to conduct an initial review of licensing renewal assessments, supported by the Electrical Licensing Committee (ELC); and
(b) informed by review outcomes, the Commissioner and ELC to develop and recommend a skilling/training program inclusive of an overview of legislative requirements, relevant changes in legislation, codes of practice and standards, requirements when working with apprentices and trainees and young people and other testing requirements as appropriate; a©**(c)** empower the Electrical Safety Office to develop a licence renewal assessment informed by these outcomes.

Recommendation 36: Consider introducing licence renewal assessment every five years for electrical workers and every three years for electrical contractors.

Transitioning apprentices to work

Consideration has also been given to assisting apprentices to transition to employment while their licence applications are being processed. At present stakeholders have advised it can take some time for apprentices to receive their electrical licence. During the time between completing the apprenticeship and receiving a licence, workers are limited to performing trade assistant work despite the completion of their apprenticeship.

Master Electricians Australia raised the issue of licence approval wait time as part of the Review. Master Electricians Australia noted apprentices are disadvantaged by the process at present as they cannot implement their training as a tradesman during the current wait time. Stakeholders also noted that during this period employers are often reluctant to offer a formal contract of work, leaving the apprentice in limbo. To remedy this issue stakeholders sought alternative options be explored to solve this administrative delay to ensure apprentices move into trade jobs as soon as possible after finishing their apprenticeships.

The approach currently taken in Victoria is to recognise a three-month interim licence on completion of apprenticeships. This interim licence would ensure that workers are able to swiftly transition into trade jobs upon completion of their apprenticeships, remedying the current administrative delays raised in consultation. This approach is considered fair and suitable for adoption in Queensland.

Recommendation 37: To assist apprentices to transition to work, consider deeming an apprentice who successfully completes all apprenticeship and licence testing requirements and who lodges a licence application competent to hold an interim electrical worker licence for up to 3 months while the application is considered.

Access to Relevant Australian Standards

Throughout the Queensland Electrical Safety legislation is references to relevant and applicable Australian standards, most notably the wiring rules (AS/NZS 3000). It was raised during the Review whether a mechanism could be introduced to ensure access to all relevant Australian Standards for licenced electrical workers to assist in ensuring compliance.

Master Electricians Australia (MEA) raised the issue of access to relevant Australian Standards in their submission to the Review. MEA noted the New Zealand Electrical Safety Regulator has made the decision to provide electronic access to 87 AS/NZS and NZ standards. MEA noted the provision of standards was not free however was included in a licence fee for all electrical workers. MEA noted the introduction of a system similar to that of New Zealand would lead to a safety benefit and industry skill increase contributing to safer community outcomes and reduced unsafe work.

Noting the important role Australian Standards play in achieving compliance with the Electrical Safety Legislation in Queensland, it is recommended to consider providing all licenced electrical workers with an electronic copy of relevant Australian Standards as part of the licensing fees.

Recommendation 38: Consider providing all licensed electrical workers with an electronic copy of relevant Australian Standards as part of licencing fees (related to Recommendation 62).

External Licences

Section 65 of the Act provides that a regulation may prescribe particular external licences to be equivalent to particular electrical work licences. The Regulations at section 41 states

that an external licence mentioned in schedule 1 is equivalent to the electrical work licence stated in the schedule for that external licence. Schedule 1 lists licences from various Australian jurisdictions and the Queensland equivalent (for the purpose of section 41 of the Regulations). Beyond this, no mention is made of further requirements. The ESO raised with the Review the scenario in which a person is a resident of Queensland for an extended period of time, and the appropriateness of such a person obtaining a Queensland licence. The rationale for such a requirement is patent – licence fee should flow to the regulator in the jurisdiction in which the licence holder is accustomed to residing and working. The example of a drivers' licence and requirements to switch to a licence granted by the local regulator is one of many that could be cited as an appropriate example. The Review is of the opinion that a length of time in which a person resides in Queensland, after which the holder of an external licence should obtain a Queensland licence, should be identified in consultation with the ELC.

Recommendation 39: Consider introducing a requirement where a licenced electrical worker is undertaking work in Queensland with an external licence from another jurisdiction and their primary place of residence is in Queensland, that the person applies for a Queensland licence after a period of time that could be considered and informed by the Electrical Licensing Committee.

Licence cards

Enhancing compliance with the electrical safety framework is multifaceted, one key area of compliance to be considered is the licensing regime. Licensing of electrical workers is one mechanism of ensuring workers are competent to perform the relevant electrical work in a way that is electrically safe. Licensing affords the community protections when engaging a worker as it provides confidence and ensures the worker is competent to carry out the work in a way that will not endanger life or property. Fraudulent use of licences, which may include use of licences by unlicensed, or suspended workers is a betrayal of community and employer trust. This poses significant risk to both persons and property. During the Review it was noted that the Work Health and Safety Queensland licensing approach includes a photographic component. This differs to the electrical licensing scheme which currently does not. A photographic component of a licence offers a level of protection to employers and the community in affording them confidence and trust in the worker they engage through verifying that the licence is of the worker they engage and not someone else.

During the public consultation phase Master Electricians Australia (MEA) submitted to the Review a recommendation to introduce electronic licensing including photo identification. MEA noted the importance that consumers and employers have an ability to ensure that the person they are hiring is the person that has obtained a licence. MEA indicated strong support of regulation requiring that electrical licences have a photo component on them/stored by the regulator. It was also raised in their submission that the New Zealand system of electrical license carries photo identification. This may be a model for Queensland to consider.

Introducing a photographic component of an electrical licence affords the community equivalent protections to those they are provided under the Workplace Health and Safety Queensland Licensing Scheme. It is considered that the photographic component

empowers members of the community to ensure their worker is the holder of the licence and will assist in deterring the fraudulent use of licences. The Review considers the introduction of photographic licences is a simple and effective measure to enhance compliance with the electrical safety licensing scheme.

It is noted that the Workplace Health and Safety Queensland licensing approach may be able to provide a model of implementation for this recommendation.

Recommendation 40: Ensure photographic electrical licences, based on the current Workplace Health and Safety Queensland licensing approach, are incorporated within the ESO's electronic licensing database, to prevent and deter fraudulent use of licences by unlicensed or suspended licence holders.

B. Contractors and QBPs

QTPs have been referred to above under section 5.4 of this report in the context of electrical safety duties. Likewise, Qualified Business Persons (**QBPs**) are another role of importance to electrical businesses, with the aim of ensure proper business operations.

Currently, the Regulations at s 7(1)(a) require a QBP to be "a fit and proper person". During consultation, the ETU noted the test for a fit and proper person for a QBP was not clear with respect to issuing an electrical contractor licence. The ELC also noted that a number of QBPs who have had disciplinary action under the current arrangements were able to start up a further business and become the QBP on another licence. This includes QBPs who were directors of companies.

Stakeholders including the ETU also noted that at present there is no requirement for the QBP or the electrical contractor to take any advice or directives from the QTP to implement changes, processes or solutions for the company to meet their duties under the Act. The ETU sought these issues to be addressed through the addition of clear regulations to ensure the integrity of the QBP, including the requirement of an elaborated fit and proper person test. The ETU noted mechanisms needed to be developed to ensure electrical contractors and QBPs are not able to start another company if they have not met standards previously.

The Review is of the opinion that the qualifications for both electrical contractors and QBPs could be enhanced to ensure no previous record of dishonest business activity, such as phoenixing, along with competency assessments more generally. Electrical contractors declaring bankruptcy to evade disciplinary measures, for example, would be excluded from obtaining a new licence under an elaborated fit and proper test. The requirement of a fit and proper person test of this nature will ensure the integrity of QBPs and electrical contractors seeking new licences. These matters are set out in Recommendation 41.

The ETU also deemed it to be appropriate action to mandate training for QBPs to ensure they understand the requirements under the federal *Fair Work Act 2009* and Queensland *Industrial Relations Act 2016* with respect to employment conditions. Regarding training more broadly, the Review holds concerns for recognising business experience as sufficient evidence of competence. More specifically, having considered training requirements available, the Review proposes that increasing QBP competence can be

achieved by requiring completion of the business components of the Certificate IV in Electrotechnology – Electrical Contracting (UEE42120) or equivalent. These matters are set out in Recommendation 42.

Finally, the ETU advocated for a requirement to ensure that QBPs and company owners take on reasonable advice provided by the QTP in relation to electrical safety. While the above two reform proposals (Recommendations 40 and 41) aim to enhance requirements to hold the positions of a QBP (or contractor), this proposal aims to ensure that, once appointed, a person makes decisions in the interests of electrical safety. The Review is also agreeable to the creation of some form of duty to observe the reasonable advice of the QTPs regarding electrical safety, in order to achieve this further aim. This matter is set out at Recommendation 43.

Recommendation 41: It is recommended that a fit and proper person test for Electrical Contractors inclusive of the Qualified Technical Person and Qualified Business Person roles be introduced by establishing no unsuitable previous record of dishonest business activity, dangerous or serious safety breaches and criminal convictions exist. Thus, enabling a regulatory lever to prevent unethical business practices such as phoenixing, declaring bankruptcy to avoid disciplinary measures, etc.
Recommendation 42: Consider removing existing accredited training requirement of QBPs on an electrical contractor's licence and replace with a requirement to complete all the business components of the Cert IV in Electrotechnology – Electrical Contracting (UEE42120) or equivalent.
(a) Consider removing provisions for QBP in the Regulations s 7(d)(iii) to accept business experience as equivalent to formal qualifications and experience as experience is not a precursor to competence.
Recommendation 43: Consider implementing a requirement for QBPs or the PCBU to accept the reasonable advice, suggestions and solutions provided by a QTP with respect to electrical safety. Further, consider implementing a penalty infringement should the QBP or PCBU fail to act on the reasonably practicable electrical safety advice provided by a QTP.

9.2 Enhancing compliance

Separate to improving approaches to ensure electrical worker competence in Queensland, the Review has considered ways to enhance compliance with various requirements that relate to electrical work. The Review's considerations of enhancing compliance have largely focused on reporting requirements, auditing by the ESO, and investigations and prosecutions by the relatively newly established independent Office of the Work Health and Safety Prosecutor (**OWHSP**).

A. Reporting

Reporting to the Regulator on relevant electrical safety matters is necessitated by the Act. Reporting is used by the Regulator as a trigger for compliance promotion, inspection and enforcement activities in addition to its use as data in analysis such as trend-based analysis. Where reporting requirements are misunderstood, this can lead to both over

and under reporting. This contributes to less meaningful data sets and less oversight of current and emerging issues for the Regulator.

Clear reporting requirements

Mandatory reporting to the Regulator provides invaluable oversight of particular aspects of industry. One example that demonstrates the benefits of mandatory reporting within the electrical safety regime is the mandatory reporting of serious electrical incidents and dangerous electrical events. Reporting of these incidents provides intelligence to the Regulator on sources of significant risk, this can contribute towards the development of additional guidance material, compliance campaigns and regulatory change where appropriate.

During the public submission period, NECA submitted to the Review that their members sought clarity on what the reporting requirements are when electricians encounter previous work that is unsafe or "dodgy" or where they find non-conforming electrical products.
Unsafe work and non-conforming electrical products can pose significant risk to community, to workers and to property. Where unsafe work or the use of non-conforming products is not rectified this can result in a serious incident. Under section 57A of the Act, the Regulator has the power to direct defective electrical work to be rectified. This is a mechanism to ensure that where the Regulator identifies defective electrical work that it is corrected to rectify the associated risk. Noting that when an electrical licence holder performs work that is not electrically safe it is grounds for disciplinary action by the Electrical Licensing Committee, it is considered that reporting of unsafe equipment, installations or non-conforming products consistent with the purpose of the Act in preventing injury and loss of life and property damage. It is therefore considered that a sensible and appropriate approach would be to clarify reporting requirements of when electrical workers or contractors encounter non-conforming products or otherwise unsafe equipment or installations to provide the Regulator with additional oversight ensuring key protections for the community.

Recommendation 44: Consider clarifying reporting requirements when electrical workers or contractors encounter non-conforming products or other unsafe equipment or installations.

Enabling better reporting

As "reporting" is essentially communicating information that should be known more widely for safety reasons, both immediately and into the future, it is possible to consider how communication might best be mediated. Over the past 20 years, various digital communication technologies that are effectively instantaneous in nature have proliferated across much of the globe, and certainly across Queensland. Technology can mediate timely communication in the interests of safety, provided it is user friendly and well-administered.

Under the current framework where a licensed electrical contractor who connects an electrical installation on which electrical work has been performed to a source of electricity must, as soon as practicable after the connection, give the person for whom the

work was performed a certificate, meeting the requirements under the Regulations. Where a licenced electrical contractor issues a certificate, they must keep a copy of the certificate for at least five years after the certificate is given.

During the consultation process concern was raised by multiple stakeholders, including the ESB and committees as to whether testing was being carried out as required. With consideration to this concern, attention was turned to implementation of a measure to address the issue. One proposal noted to address this concern was provided by NECA during the public submission process who suggested the implementation of a central database for all electricians to enter mandatory testing results in accordance with the requirements at s 218 of the Regulations. It was noted during consultation that a digital system has been developed in Victoria and Western Australia for the lodgement of certificates of compliance. A similar system whereby electrical contractors are able to submit inspection and testing evidence and results with ease was considered.

The Review has therefore decided to recommend the use of a portal – whether integrated within the current ESO system or new – that could enable electrical contractors to submit inspection and testing results immediately and with ease.

Recommendation 45: Explore the development and implementation of an electronic reporting portal to enable electrical contractors and their workers to submit reports for inspection and testing results, including evidence of tests to be administered by the Electrical Safety Office.
(a) it is further recommended the reports should include a list of the in-scope electrical equipment/devices installed to assist the Electrical Safety Office to regulate compliance with legislation and wiring rules as well as to assist in the event of a product recall.

<u>Enhancing auditing and rural compliance</u>

Apart from self-reporting requirement, audits for electrical safety compliance conducted by the ESO are another means of ensuring compliance.

Specific rural installations

Specific auditing issues raised with the Review include a regulatory exemption for off-grid rural installations. Section 55 of the Act states that a person must not perform or supervise electrical work unless they hold an electrical work licence that authorises them to perform the work. Under the same section of the Act, a person is exempt from the above requirement if the electrical work is '*remote rural installation work*'. Schedule 2 - Dictionary of the Act defines 'remote rural installation work' as work on an electrical installation, when all the following criteria are met:

a. the only source of electricity supply to the installation is a privately owned generating set used by;
    i. a farmer on and solely for a farm; or
    ii. a grazier on and solely for a grazing property
b. the generating set is not directly or indirectly connected to the works of an electricity entity (e.g. another business that generates or supplies electricity, or the grid);

c. the capacity of the generating set is not more than 75kW;
d. a person holding an appropriate electrical work licence is not available to perform the work due to the remote location of the farm or grazing property.

Concern was raised during the Review of a potential neglect of electrical safety standards perpetuated by an exemption of this nature. It was identified that this neglect could be rectified the removal exemption. Further to the removal of the exemption, arrangements to address the accessibility issues the exemption was seeking to address were canvassed. The Review also considered that whilst the removal of the exemption would effectively cease unlicensed work of this nature would not take steps to identify or address installations that may be unsafe as a result of this exemption. One proposal raised during the Review was an auditing campaign focused on uncovering unsafe installations and working collaboratively with owners to ensure arrangements are in place to bring them up to standard.

Queensland Farmers' Federation indicated strong support for the continuation of the exemption for off-grid rural installations, citing significant accessibility issues in rural and remote areas in addition to premium costs. Other stakeholders including NECA sought the removal of the exemption for off-grid rural installations, citing members' experiences encountering unsafe installations and electrical equipment on rural properties. They noted experiences including work sheds unprotected by RCDs, wiring completed by unlicensed electrical workers and use of unsafe electrical equipment. NECA advocated for the Review to consider better electrical protections for the rural community including the removal of rural exemptions.

The Review is seeking to increase electrical safety in the rural sector through the removal of rural exemptions however engagement with stakeholders demonstrated the complexities of achieving this given accessibility and economic challenges. It is considered that the removal of exemptions without transitional arrangements to accommodate these challenges is not a reasonable measure to take. As an alternative, it is proposed transitional arrangements will be applied to assist the sector with the removal of the exemption, increasing the threshold of electrical safety in the rural sector.

Recommendation 46: Consider improving rural compliance with electrical safety standards, by removing the exemption for holding an electrical work licence for "remote rural installation work" (55(3)(c)) over a suitable transitional period related to recommendation 47.

Expanded auditing focus

During the Review concern for continuation of the regulatory exemption for off-grid rural installations was raised. The removal of the exemption raised further questions about transitional arrangements that could be implemented to remedy the anecdotally evidenced abundance of unsafe installations, an unintended consequence of the exemption.

Stakeholders raised the issues of accessibility and cost as barriers to the removal of exemptions. It was also noted during consultation that removing exemptions would not

remove existing risk and therefore that an auditing program to address unsafe installations would be necessary in a transitional period. Stakeholders raised queries about costs in relation to a potential auditing scheme, emphasising the importance of it being accessible with regards to costs to those impacted.

A reasonable approach was deemed to be the development of a rural auditing program over an appropriate period of time with initial audits intended to ensure all installations are safe followed by an agreed implementation plan between the Regulator and the installation owner to bring the installation up to standard. It was considered that this approach would adequately manage imminent risks whilst not placing undue cost on the installation owner.

Recommendation 47: Consider implementing a rural electrical installation auditing program over an appropriate transitional period (related to recommendation 46) to initially audit for electrical safety to address immediate or imminent risk, and to ensure the immediate removal of the electrical risks posed by those electrical installations.
(a) It is further considered that those electrical installations that are non-compliant should be brought up to the required standard over a suitable period of time in consultation and agreement with the Electrical Safety Office via plans submitted and approved by the Regulator.

Recreational vehicle and vessel audits

The growing utilisation of caravans and mobile homes for semi-permanent and permanent residency and consumer demand for 'off-grid' and 'self-contained' vehicles has seen an increase in the use of solar installations and battery storage. Due to the increased uptake and utilisation of recreational vehicles including RVs, caravans and camper trailers, as well as the increased use of solar panels on these vehicles, the Review considers this context to be an important frontier of electrical risk and safety. The use of solar on caravans was briefly touched on in the context of considering kinds of extra low voltage equipment that may be suitable for inclusion in an expanded definition of "electrical equipment" or for specific kinds of work within an amended definition of "electrical work" (see section 6.3 of this report).

Similarly, there is a growing vessel manufacturing market in Queensland, along with commercial operations that have increased over time, particularly given the prevalence of tourism in Queensland. A brief stakeholder submission to the Review requested consideration of electrical system requirements for vessel operators and onboard crew. The submission also referred to the need for consultation with the national regulator, the Australian Maritime Safety Authority (**AMSA**). AMSA is responsible for regulations and standards for vessels, including in the form of the National Standard for Commercial Vessels (**NSCV**). NSCV provides standards for vessel survey, construction, equipment, design, operation and crew competencies for domestic commercial vessels. Part C of the NSCV covers the topics of design and construction, with sub-section C5B concerning electrical components. C5B provides standards for the design, construction, installation, and repair of electrical installations for vessels, which supplements general requirements in Part B.

In 2019, AMSA undertook consultation on C5B to inform revisions that commenced on 1 January 2020. The main change to the updated electrical standard is the requirement for vessels to comply with their state or territory electrical regulator's requirements as applicable. As further explained on the AMSA website:

> New or modified electrical installations on vessels less than 35 metres will also need to comply with either:
> - Australian Standard (AS/NZS 3004.2:2014) and the required outcomes of NSCV Subsection C5B, or
> - Class Rules (without being required to obtain a certificate of classification).

Given this interaction between AMSA standards and Queensland's electrical safety laws, it appears to the Review that any requirements set out in the Act concerning electrical equipment and electrical installations would apply to commercial vessels. The term "vehicle" is broadly defined in the Act to mean "any means of transport by land, air or water". As such, subject to amending the regulation of "vehicles" broadly (discussed in section 6.3 of this report), vessels will be automatically captured within the regulatory scope of the Act. Despite this automatic operation, consultation with AMSA prior to amending particular requirements on vessels may nevertheless be prudent.

Electrical installations used in both (land) vehicles and vessels raise unique safety concerns given their mobility and, in the latter case, the environment that surrounds them (i.e. water). For land vehicles, the Review is of the opinion that an audit of the electrical installation at point of sale will help to ensure ongoing viability. Thereafter, or more broadly, the Review considers 10-year audits to be desirable, to the same end. This is somewhat analogous to the requirement for a licensed person to test LPG gas tanks every 10 years to establish continued safety. This is the responsibility of the registered owner of the vehicle, and it is an offence to operate a non-compliant vehicle. Whether or not this regulatory approach is necessary for vessels, in addition to land vehicles, is a matter for further consideration and, potentially, interjurisdictional consultation.

Recommendation 48: Ensure the electrical safety of installations in recreational vehicles by requiring an electrical installation audit at point of sale and every 10 years (in line with gas tank testing), and:
(a) consider extending this provision to domestic, commercial and recreational vessels that utilise solar panels and or generators as their primary source of electricity
(b) ensure regulatory oversight and proactive inspections are undertaken by the Regulator.

<u>Regulator</u>

Section 122C of the Act sets out the Regulator's powers to obtain information, particularly in relation to "a possible contravention of this Act", information "that will help the Regulator to monitor or enforce compliance with this Act" (s 122C(1)), or information relevant to licensing decisions (s 122C(2)). The mechanism by which the Regulator can obtain information is a written notice served on a person, requiring information, documents, or to appear in person to give evidence or produce documents (s 122C(3)). Failing to comply without reasonable excuse is subject to a penalty (s 122C(6)).

Currently, the powers to obtain information are limited to contraventions, enforcement and licensing decisions. However, the Regulator's role extends beyond these functions. For example, at sub-section 122(1)(c), a function of the Regulator is "to provide advice and information on electrical safety to duty holders under this Act and to the community". Naturally, the provision of information depends on first obtain it. The ESO has requested expanding powers to obtain and provide information in fulfillment of his function. The Review is agreeable to a suitable expansion.

Recommendation 49: Consider enhancing the Regulator's powers to obtain and provide information regarding electrical safety (Act s 122C), to better fulfill the Regulator's function to "provide advice and information on electrical safety to duty holders under this Act and to the community" (Act s 122(1)(c)).

Commissioner for Electrical Safety

To assist with enhancing both competence and compliance, the Review is considering what roles the Commissioner (in conjunction with the ELC) may play.

- Overseeing an enhanced auditing scheme
- Overseeing licensing assessments (initial and renewal)
- Overseeing CPD.

The ETU noted the opportunity in their submission to increase the powers of the Commissioner for an expanded role. They also advocated for the ELC to develop a licensing renewal assessment in place of the current test known as skills maintenance. The concept of expansion for the Commissioner's role was echoed in a further stakeholder submission noting the potential to have an element of research, analysis and development of electrical industry safety standards in addition to electrical licensing practices to improve electrical safety in Queensland.

With proposals raised to introduce a number of new initiatives as part of the Review to improve electrical safety in Queensland, it was considered these additional initiatives could form the expanded Commissioner role that was sought by stakeholders during consultation. Noting the experience, expertise and representation on the electrical licensing committee it is proposed that initiatives including the new electrical licencing assessment, CPD and electrical licensing renewal assessment could be implemented and managed by the Commissioner with support of the ELC. Furthermore, it was considered that the proposed rural electrical safety audit initiative could be developed and lead by the Commissioner as part of the expanded role.

To support the Commissioner in an expanded role it is considered that departmental officers may be made available to undertake their functions as agreed with the Regulator.

Recommendation 50: Consider expanding the Commissioner's responsibilities to include the development and approval, in conjunction with the Electrical Licensing Committee, of an enhanced auditing scheme, licensing assessments, licensing renewal assessments and Continuing Professional Development (Act, s 71) to be administered by the Electrical Safety Office.

The powers of the Commissioner are set out in a general way, as follows: "The Commissioner has the powers necessary or convenient to carry out the Commissioner's functions" (Act, s 72). The Act lists six functions for the Commissioner at section 71, including to "manage the activities of each committee, having regard to its objectives, strategies and policies, and to ensure each committee's efficient operation" and "fulfil the roles of chairperson of the board and chairperson of the Electrical Licensing Committee. The Electrical Licensing Committee (ELC) is tasked with, *inter alia*, taking "necessary disciplinary action" and "receiving and investigating complaints about electrical work". In order to fulfil the function of both investigating complaints and taking necessary disciplinary action, the ELC (including its Chair, the Commissioner) must access and assess information. Outside of the formal mechanism of judicial action, including compelling persons to attend a hearing and give evidence, the ELC relies on the cooperation of the license holder and other persons the subject of its investigation. To assist with these functions, the ELC requests the ability to request production of documents and attendance at an interview for the purpose of fulfilling the ELC's functions. The Review is agreeable to this request.

Recommendation 51: Consider enhancing the powers of the Commissioner for Electrical Safety to enable requesting the production of documents or to attend an interview, by extending existing powers in relation to electrical licensing committee matters (s 72 and s 88).

Recommendation 52: Consider aligning the Commissioner for Electrical Safety's powers to those set out in the Resources Safety and Health Queensland Act 2020 (s 58 and s 59).

The Review understands that the Commissioner is a member of all committees established by the Act. However, the Act itself only provides an explicit foundation for the Commissioner's membership of the Electrical Licensing Committee (as Chair). The functions of the Commissioner set out in the Act should reflect the need for the Commissioner to have oversight of areas of electrical safety beyond licensing. The Review therefore recommends explicating the Commissioner's roles vis-à-vis all committees within the Act.

Recommendation 53: Consider the Commissioner's oversight and enhancing the Commissioner's ability to fulfill responsibilities of the position through membership and chairing of all electrical safety committees (s 71; Part 8, Divisions 2A and 2B).

<u>Boards and Committees</u>

Section 106 of the Act sets out the various grounds for taking disciplinary action against the holder of an electrical work licence. There are currently seven grounds, set out at sub-sections (a) to (g). At present, those grounds present the picture of an isolated worker, unconnected from and uninfluenced by surrounding context. In contrast, one may advocate for contextual additions to section 106. This would involve viewing a worker as connected and accountable to an electrical contractor, and as having relationships with its associated QBP(s) and/or QTP(s). If we were to take this broader view, it may useful

or necessary to refer an electrical contractor, QBP or QTP to the ELC where a relevant worker is referred to the ELC. If deemed useful or necessary, the Review is of the opinion that the power should exist in section 106 or another relevant section of the Act.

Recommendation 54: Consider enhancing the Electrical Licensing Committee (ELC) functions to include appropriate oversight of electrical contractor licence holders inclusive of Qualified Business Persons (QBP) and Qualified Technical Persons (QTP) by:
(a) providing the ability to have an electrical contractor licence holder referred to the ELC whenever an electrical worker employed by the electrical contractor is referred under s 106; and
(b) providing the ability of the ELC to have the QBP and/or QTP on an electrical contractor licence referred to the ELC where an electrical worker employed by an electrical contractor is referred under s 106; and
(c) providing the ability to have the QBP and/or QTP for a Person Conducting a Business or Undertaking (PCBU) to be able to be referred to the ELC where an electrical worker employed by the PCBU is referred to the ELC under a s 106.

The function of the ELC is to give advice and make recommendations to the ESB regarding electrical licenses and training. Further, the ELC takes disciplinary action against electrical contractors and workers, and reviews decisions made by the Regulator pertaining to electrical licences. Chaired by the Commissioner, the ELC has four further members, representing employers, workers and the community. The Review sought to consider what changes if any should be considered to improve electrical safety in Queensland. Within this broad aim, the Review has considered the role and responsibilities of the ELC and how they can be enhanced.

During the public submission process the ETU sought for the ELC to develop a training programme to replace the current "skills maintenance test", after it was deemed to no longer be achieving the intent of ensuring competency. MEA recommended that appointment, term lengths, representation and management of relevant board and committees, ensuring a balance of employer, employee and industry participation. MEA noted it to be imperative that all boards, committees and their members are achieving the objects of the Act and that they are regularly assessed to ensure fresh ideas, technologies, industry trends and education are embraced to reflect the current operation of the industry.

Noting the ELC's role and the composition, the Review is of the opinion that it presently lacks training and education representation. The experience and knowledge that would be brought by such a representative would be crucial to the development of a successful licence renewal program. The addition of training and education representation would supplement the current composition of the committee and assist the ELC with its responsibilities. Such an addition is therefore recommended by the Review.

Recommendation 55: Implement the inclusion of an additional member category of "training and education representatives" for the Electrical Licensing Committee to ensure the committee has adequate capacity in undertaking its recommended expanded responsibilities, including but not limited to review and development of a revised licensing renewal assessment (see Recommendation 35).

During the Review, the ESO noted a historical anomaly in the Act. Historically, the functions of the electrical safety Regulator were merged with energy generally (now part of the responsibility of a separate agency). However, curiously, "energy efficiency" is found as subject matter to which the ESB and Electrical Equipment Committee functions are directed. Given the purpose of the Act, namely safety, it appears incongruous that the ESB and Electrical Equipment Committee should extend their advisory capacity to a matter that neither the Regulator nor the Minister is responsible for. As such, in line with the ESO's recommendation, reference to "energy efficiency" should be removed.

Recommendation 56: Remove the energy efficiency function of the Electrical Safety Board (Act, s 76(3)) and Electrical Equipment Committee (Act, s 94(2)), which is a holdover from pre-2002 functions exercised by the Electrical Safety Office that do not concern electrical safety.

Prosecution and disciplinary options

Part 2, Division 2A of the Act sets out penalties and sentences related to electrical safety duty breaches. Three broad offences are created:

- category 1, reckless conduct (s 40B)
- category 2, failure to comply (s 40C)
- category 3, failure to comply (s 40D)

The distinction between category 2 and 3 is found in the result of the failure to comply with an electrical safety duty. Category 2 required exposing an individual "to a risk of death or serious injury or illness", whereas category 3 contains no such requirement.

Through discussions with the OWHSP, the Review has become aware of gaps in prosecution options for the Regulator that could be rectified in a way that recognises a gradation of seriousness in offending, covering negligence, recklessness and intentional unlawful conduct. Specifically, the OWHSP advocated for negligence as an alternative within the category 1 offence, in addition to recklessness. Adding a further fault element would better tailor the Act's penalties to difference circumstance and is consistent with recommendation 23 in 2018 Boland Review of national model WHS laws. Noting the impending changes as a result of the Government's implementation of the Boland Review, the Review is of the view that consideration should be given to creating a new offence of negligence to be implemented as a category 1 offence in the electrical safety legislation.

Recommendation 57: In addition to recklessness, and in addition to any changes made as a result of the Government's implementation of the Boland Review, consider creating a new offence of negligence to be implemented as a category 1 offence.

Section 111 of the Act provides a power for the ELC to take disciplinary actions "against a person who was the holder of an electrical contractor licence" (s 111(1)). This provision aligns with the functions of the ELC, set out in section 88, which include taking "necessary disciplinary action against holders of electrical licences and against previous holders of

electrical contractor licences" (s 88(1)(b), underline added). The ELC's powers under section 111 extend to requiring the correction of a fault or defect in electrical work, a reprimand or caution, imposing a penalty, and/or disqualifying a person from holding an electrical contract licence, or electrical work licence, or both.

While this form of disciplinary action is available in respect of previous holders of electrical contract licences, the Act does not appear to provide the same avenue in respect of electrical work licence holders. The ESO has therefore advocated for a suitable, equivalent provision. The Review is agreeable to improving licensing standards and accountability in this way.

Recommendation 58: Consider introducing disciplinary provisions for electrical work licences no longer in force, as exists for electrical contractor licence holders (Act s 111), to ensure accountability of acts done while the licence was in force.

Electrical Licence Inspectors

Compliance with the electrical licensing regime is fundamental to ensuring only those who hold an electrical licence are undertaking electrical work. It was raised during the Review that in Western Australia, legislation allows the Regulator to designate powers as a means of ensuring licensing compliance. Specifically, a person may be designated an Electrical Licence Inspector (Electrical Trade Union). Requirements of this role include being full-time, paid employees of the Communications, Electrical, Electronic, Energy, Information, Postal, Plumbing and Allied Services Union of Australia (CEPU) in Western Australia; having a sound understanding of the licensing regime and legislation; and being a qualified and licenced electrician.

Electrical Licence Inspectors are authorised to inspect electrical licences for the purpose of assessing compliance with electrical licensing requirements under the *Electricity Act 1945* (WA). Breaches of the *Electricity (Licensing) Regulations 1991* (WA) in respect of a licence examined or a person found to be without a licence (where a licence is required) are required to be reported to the Chief Electrical Inspector (Utilisation) at Energy Safety (WA).

Noting the Approach taken in Western Australia, the ETU advocated for a similar power in Queensland; that is, for the Regulator to designate limited powers of inspectors to relevant union officials. This would enable relevant ETU officials to examine and inspect electrical contractors' and workers' licences where required. The ETU advocated for this change on the basis that it would provide additional protections to ensure only those who hold an electrical licence are undertaking work. The ETU also noted in its submission that the geographical reach of ETU officials throughout Queensland and extensive movement across the state, would be a significant addition to the ESO efforts (and logistical challenges) in ensuring state-wide licensing compliance.

Ensuring licensing compliance is fundamental to ensuring electrical safety across Queensland. The approach taken in WA demonstrates an effective method of ensuring widespread licensing compliance across significant distances and a sparsely populated state by suitably qualified workers. It is recommended that a similar approach is taken in

Queensland to assist with increased compliance, meaning competent and safe electrical work.

While seeking broad compliance, the application of this approach could in part target larger organisations and work sites, proportionate to risk. For example, appointments could be made for license inspectors *within* large businesses (those with 20 or more full time equivalent employees). Such appointments could follow a ballot of trade union members. It is noted, the function of the licence inspector would not extent to carrying out inspections of electrical installation work or issuing orders. However, if the electrical licence inspector identified a possible breach of electrical safety regulations, the matter would be reported to the ESO.

Recommendation 59: It is recommended to implement electrical licence inspectors. The function of the electrical licence inspector is to inspect electrical licences for the function of assessing compliance with electrical licensing requirements. An electrical licence inspector may not carry out inspections of electrical installation work or issues any orders. However, if the electrical licence inspector identified a possible breach of electrical safety regulations, they must report the matter to the Electrical Safety Office. An electrical licence inspector must be an employee of the Electrical Trades Union in Queensland and hold a current electrical worker's licence.

During the Review the use of industry safety and health representatives in the coal mining jurisdiction under the *Coal Mining Safety and Health Act 1999* was explored. Industry safety and health representatives are a concept established under the *Coal Mining Safety and Health Act 1999.* Under section 109 of the *Coal Mining Safety and Health Act 1999,* the union may after a ballot of members appoint up to 3 persons to be industry safety and health representatives, with appointments for 4 years. Industry safety and health representatives have a number of functions including inspection of coal mines to assess the level of risk to the safety and health of coal mine workers, reviewing procedures in relation to safety and health, detection of unsafe practices and taking action accordingly, participation in investigations into serious accidents and high potential incidents and help in relation initiatives to improve health and safety at coal mines.

The legislation provides for industry safety and health representatives to be accompanied by a site HSR and site senior executive during an inspection.
The Review considered the application of this model in the electrical safety jurisdiction. Industry safety and health representatives afford additional safety protections through increased accountability and compliance activity. Implementation of this model would also support the introduction of electrical specific HSRs, a notion supported by the Review. The Review considers the model established for industry safety and health representatives and HSRs in the coal mining environment to provide additional safety protections for workers with consideration to the unique risk profile of coal mining. The Review is of the view that a similar unique risk profile is present in the electrical industry and a replica model would be a sensible approach to elevate the profile of electrical safety and afford additional protections for workers. The Review therefore recommends the model for industry safety and health representatives implemented in the coal mining legislation is replicated in the electrical safety legislation.

Recommendation 60: Consider implementing similar provisions from the Queensland *Coal Mining Safety and Health Act 1999* (s 109 & s 118) for industry safety and health representatives. The union after a ballot of its members may appoint up to three industry safety and health representatives for a term of up to four years. The role is conducted on a full-time basis and ensures an acceptable level of electrical safety, reviews electrical safety procedures, takes action to 'make safe' in the event of an electrically unsafe installation and assists in the onsite investigation of unsafe practices.

9.3 Resourcing

Beyond substantive issues being considered as part of the Review, implicit in many potential reforms are funding or staffing implications. For example, the Review is cognisant of greater demands on inspectors' time to carry out enhanced audits in rural areas. As such, the Review is foreshadowing the need to consider how resourcing may be navigated.

Currently, Energy Queensland financially contributes to the cost of electrical safety in Queensland. However, over time the electricity generation and supply market has grown and expanded. Other large GOCs and private businesses benefit from the services provided by the ESO but do not contribute financially to the ESO. Contribution by other entities is considered by the Review to be both appropriate and necessary.

This proposal was raised during consultation with several relevant stakeholders. It was noted by one stakeholder that it is difficult to argue the philosophy behind the proposal. However, stakeholders queried the mechanics of implementation, including how contributions would be calculated. It was noted that Energy Queensland's contribution is based on national metering identifiers (NMIs), which translates to customers.

The other model that was considered was the funding model of Work Health and Safety Queensland. The Review noted a portion from WHSQ's funding comes from the Building and Construction Work Health and Safety (Queensland) levy. This levy is combined with the Portable Long Service Leave levy and the Construction Skills Queensland levy which combined are imposed on the total coast whether direct or indirect, of building and construction work costing $150,000 or more (excluding GST). Currently the combined levies equate to 0.575% of the total cost of the building and construction work. In practice these levies equate to $5.75 for every thousand dollars (or part thereof), of this $1.25 is paid directly to Workplace Health and Safety Queensland, $1.00 is paid to Construction Skills Queensland and the remaining $3.50 is invested to provide ongoing funds for long service leave requirements. The Review considered that a similar approach could be implemented for electrical safety whereby a levy is imposed on industry to contribute to Queensland's robust electrical safety regime from which they benefit. The Review considers the contribution in a replica model for electrical safety would be significantly less than the CSQ model. It is noted that this approach whilst having a minimal financial impact on industry would significantly increase funding for the Electrical Safety Office and enable the Regulator to meet increase demands with the expanding technological landscape.

With an expanding technological landscape and an electrical safety regime to match, the Review considered the inequity of a single entity contributing to the cost of running the ESO. The Review therefore sees an opportunity to increase funding of the administration to fund initiatives proposed as part of the Review whilst ensuring those participants in the industry who are benefitting from the regime are equitable contributors. That will continue into the future, particularly with the acceptance of certain recommendations of the Review, such as an expanded auditing program, enhanced role for the Commissioner, increased inspections and enforcement provisions, and licensing reforms to increase rigour and ultimately safety.

Recommendation 61: Consider conducting a review of the financial contributions that support electrical safety in Queensland with a view to require proportionately determined financial contributions from all relevant Government Owned Corporations and industry sectors including electrical contracting and renewable generators, in addition to existing "electrical safety contributions" for distribution entities (Act, Part 14A, Division 1). This recommendation is to ensure these financial contributions keep pace with the rapidly expanding volume of electricity market participants.

Licence fees

To further strengthen the capacity of the ESO to progress reforms that may be recommended by the Review, it is considered desirable to review licensing fees and ensure that the cost of compliance is taken into consideration. This will also assist with items such as auditing and increased regulatory role in areas such as training and competence and making available essential resources such as Australian Standards to ensure access and ability to comply with legislative requirements and duties.

During consultation MEA advocated for the inclusion of access to relevant Australian Standards in licensing fees for all electrical workers, as per the model implemented in New Zealand. This is one example of ensuring the cost of compliance is covered by licensing fees.

It is considered that licensing fees should be reviewed with consideration to the increasing cost of compliance following reforms suggested by the Review. It is noted that one of the overarching principles for fees and charges across Government is full cost recovery, unless a subsidy applied. Full cost recovery should represent an efficient cost, reflecting the minimum costs necessary to provide the activity while achieving the policy outcomes and legislative function. In reviewing licensing fees, the Government principles for fees and charges would be applied.

Recommendation 62: Consider undertaking a review of licensing fees to ensure that the costs of compliance are taken into account in determining licence costs, in line with the fees and charges principles in consultation with Queensland Treasury.

9.4 Further issues and recommendations

Several miscellaneous matters concerning enhancing competence, enhancing compliance and resourcing have been raised with the Review through a combination of external stakeholder submissions and a compiled departmental issue register (see 4.4). Each matter is briefly summarised below, prior to recommendations in respect of those matters.

Enhancing competence

(a) *Definition of "relative"*

Under the Electrical Safety Legislation, a person does not conduct a business or undertaking that includes the performance of electrical work only because the person is a licensed electrical mechanic who performs electrical work for the person or a relative of the person at premises owned or occupied by the person or relative. During the Review the definition of "relative" as defined in schedule 9 of the Act was raised, with question as to whether the current definition would pose property insurance issues for the relative. With consideration to this it is recommended that the definition of "relative" is aligned with the definition in the Queensland's Industrial Relations Framework.

(b) *PCBU register details for interstate workers*

Under Section 57AB of the *Electrical Safety Act 2002* a PCBU must keep a register of licensed workers, the register must be made available for immediate inspection by an inspector and must contain the information regarding the licence holder as prescribed at ss 57AB (3). Additional requirements exist at section 57AC whereby licence holders engaged by PCBUs must notify changes to their licences to the PCBU within 14 days in writing, the changes captured by this requirement are listed in section 57AC. It was raised during the Review that these sections remain silent on interstate licence holders, referred to as external licence holders in the legislation. It was considered during the Review that interstate licence holders (external licence holders) should be subject to the same rigour and oversight by PCBUs as Queensland licence holders. During the public submission process, the ETU raised the issue seeking that requirements are introduced to require if a worker presents an interstate licence, the register must include a) the State of licence, b) any conditions on the licence and, c) the expiry date of licence.
With consideration to this it is recommended to require a PCBU to keep in its register of licenced workers, the following details for workers presenting interstate licences: licence jurisdiction, any conditions on the licence and the expiry date of the licence. It is proposed that in achieving this, the requirement for licence holders engaged by PCBUs to inform PCBUs should be extended to include holders of interstate licences (external licences). This will enable PCBUs to have access to the necessary information in relation to interstate (external) licence holders to fulfil the proposed requirement.

(c) *CPR training standard clarity*

Section 28 of the Regulations requires a PCBU to ensure workers who are required to perform or help in performing electrical work are competent in rescue and resuscitation in accordance with recognized industry practices in the electrical industry. During consultation Powerlink raised interpretation issues with the use of "recognized industry practice" noting this varied between 6 and 12 months and caused complications when

industry participants recognized different intervals. It is recommended that the meaning of "recognized industry practice" for CPR training required in relation to electrical work is clarified to create a uniform minimum standard.

The Review is of the view that it is appropriate to require CPR training every 6 months, noting it should be considered a candidate for contribution to CPD requirements for licensed electrical workers.

(d) *Contractors inform the Regulator regarding QTPs*

Historically it has been required that where a QTP is no longer the holder of an electrical licence, or external contracting authority or is no longer an employee of the licensed electrical contractor under the licence, licensed electrical contractor must advise the Regulator within 1 month. It is recommended that with the advancements in technology that the timeframe to notify the Regulator should be reduced to 72 hours for a QTP on the contractor's licence. For additional QTPs it is recommended that a 28-day period is prescribed.

(e) *Insurance levels for contractors*

Noting the *Electrical Safety Regulation 2013* is 8 years old, it was considered during the Review that the insurance levels prescribed in the Regulations should be subject to review to ensure they reflect the level of cover that is appropriate for contemporary circumstances.

(f) *Refundable fees for licence applications*

Currently in Electrical Safety Legislation, it is prescribed that where an application is refused or withdrawn prior to consideration the administration component of the fee is refunded to the applicant. It is recommended this be removed with consideration to the administrative work involved in considering and refusing an application in addition to administering a refund.

Recommendation 63: Consider clarifying and enhancing miscellaneous requirements and definitions related to licensing and training, including

Under the Act, consider the following recommended amendments:
(a) replacing the definition of "relative" of a person, with the following list found in Queensland's industrial relations framework:
(i) spouse; former spouse, de-facto spouse, former de-facto spouse; or
(ii) child, ex-nuptial child, step-child, adopted child, ex-foster child; or
(iii) parent, grandparent, grandchild, sister or brother of the person or spouse of the person; and
(b) requiring a person conducting a business or undertaking to keep, in its register of licensed workers, the following details for workers presenting interstate licences: (i) licence jurisdiction, ii) any conditions on the licence, and iii) the expiry date of licence.
Under the Regulations, consider the following recommended amendments; and
(c) clarifying the meaning of "recognised industry practice" for CPR training required in relation to electrical work (s 28); and

(d) requiring licensed electrical contractors to inform the Electrical Safety Office of a QBP or QTP ceasing to work with the contractor:
(i) within 72 hours for the QBP or QTP on that contractor's licence, and
(ii) within 7 days for additional QTPs (ss 49-50); and
(e) reviewing and instating contemporary levels of insurance cover for electrical contractor licences (s 51); and
(f) removing the refundable component of fees for refused or withdrawn applications (ss 63, 236, 256 and Schedule 8).

Enhancing compliance

The Review considered reform that could enhance compliance with electrical safety. More generally this included expanding regulatory means to discover, prevent and sanction breaches and to otherwise clarify compliance requirements.

(a) *Inspector entry powers*

Inspector powers of entry have significant limitations on places used for residential purposes. Under section 140 of the Act, powers are not exercisable in a residential context except with the consent of the person with management or control of the place, under the authority conferred by a search warrant, or for the purpose of gaining access to a place the inspector may enter under section 138, but only if the inspector reasonably believes that no reasonable alternative access is available and at a reasonable time having regard to the times at which the inspection believes work is being carried out at the place to which access is sought considered necessary that inspectors have access to residential premises. It is also noted that Recommendation 47 recommends the implementation of rural installation audits. It is noted that inspectorate powers to enter residential properties would pose a significant barrier to implementation of this recommendation. Power to access residential premises to examine and assess switchboards is supported by mandatory property inspection certificate requirements and rural installation audits which without compliance may contribute to the formation of reasonable belief that an installation is not safe and not complaint. It is therefore recommended that section 140 of the Act is amended to provide inspectors the power to access residential premises to examine and assess switchboards and rural installations.

(b) *Sanctioning options*

The Electrical safety framework provides for the Regulator to take enforcement action when breaches of the legislation occur. Different breaches are associated with different sanctions. It is proposed as part of the Review that sanctioning options are reviewed with a view to introducing more effective, flexible and responsive sanctioning options. In the current legislation there are multiple types of sanctions these include penalty units and infringement notices. A penalty unit is a set amount of money used to work out each fine. The fine is calculated by multiplying the value of the penalty unit by the number of penalty units set for that breach. The number of penalty units will normally have an equivalent jail sentence for people unable or unwilling to pay the fine or where the judge or magistrate decides a prison term is a more appropriate form of punishment. Infringement notices are issued under the *State Penalties Enforcement Act 1999* and may

be issued by an inspector if they believe on reasonable grounds, that a person is committing or has committed an infringement notice offence under the legislation. Infringement notices/on the spot fines are an alternative to prosecuting alleged offenders directly through the court.

(i) Section 57 of the Act requires that licensed electrical worker and contractors comply with all conditions and restrictions included in the licence. For both holders of electrical work licenses and electrical contractor licenses there is a maximum penalty of 400 penalty units. It was raised during the Review that a more effective and responsive sanction to this breach could be an on-the -spot fine issued by an inspector. It is therefore recommended that inspectors are enabled to issue on the spot fines consistently with State Penalties and Enforcement legislation for breaches of s 57 and s 57AA. Similarly, section 148 of the Act requires the owner of equipment to apply with the unsafe equipment notice issued by inspectors unless the owner has a reasonable excuse for not complying. This provision is not an infringement notice offence instead it holds a maximum penalty of 1,000 penalty units. It was raised during the Review that an on-the-spot fine would be a more responsive and effective sanction to a breach of this provision.

(ii) During the Review it was noted that infringement notices lacked proportionality, resulting some very high fines and very low fines as opposed to a spectrum proportionate to the breach. In light of this, it is recommended that consideration is given to introducing a 'sliding scale' of fine amounts is implemented to rectify the lack of proportionality in penalty categories. It is noted this will need to align with requirements under State Penalties and Enforcement legislation.

(iii) Where on the spot fines are not paid, the agency that issued the notice can refer it to the State Penalties Enforcement Registry where an enforcement order is issued. During the Review, the ESO proposed that suspensions or conditions should be placed on licences in the case of unpaid fines. It is considered that this approach would be effective in achieving compliance and payment of the fine. It is therefore recommended that legislative provisions are introduced allowing for suspensions or conditions to be placed on licenses in the case of unpaid fines.

(iv) During the Review an omission was identified whereby the current electrical safety legislation does not prescribe an avenue for the Regulator to recover unpaid debt via Court order. With consideration for the potential for significant quantities of unpaid fines, it is recommended that an avenue is introduced to the legislation to allow for the Regulator to recover unpaid debt via Court order, including order as to costs.

(v) Under section 27 of the Regulations, where an item of electrical equipment has a serious defect, a licensed electrical worker must not connect the equipment to a source of electricity for use for its intended purpose. Breach of this provision has a maximum penalty of 40 penalty units. It was raised during the Review that this provision should clarify that licenced electrical workers can be penalised for connecting defective equipment 'knowingly' as opposed to in all circumstances. Noting the omission in the current provision it is recommended that section 27 of the Regulations clarifies that licensed electrical workers can be penalised for knowingly connecting defective electrical equipment to an electricity source.

(vi) It was raised during the Review that the Electrical Safety Legislation does not provide penalty provisions for the improper use of a licence. Noting the significant consequences of such action, it was proposed during the Review that a penalty provision should be introduced, with section 51 of the QBCC Act provided as a model of what the provision might look like. It is therefore recommended that a penalty provision is added for the improper use of a licence card, replicating the substance of section 51 of the QBCC Act.

(vii) During the Review it was raised that where an unsafe equipment notice (UEN) is directed at the owner of the of the electrical equipment, there is the risk that issuing a UEN will not be sufficient to immediately address the identified hazard. One example of this is in situations where a worker is operating the electrical equipment, but the owner of the electrical equipment is not present at the site, there is a risk that the electrical equipment will continue to be operated given the direction is not given to the person in control.

Issuing an Electrical Safety Protection Notice (ESPN), under section 147 of the Act, is a more effective mechanism for addressing defective and/or hazardous electrical equipment as the ESPN offers inspectors the ability to make an on-the-spot oral directions to the 'person in control' of the electrical equipment and has immediate effect. Given the greater effectiveness of s147 it is recommended that s148 Unsafe Equipment Notice is repealed to ensure hazards are immediately addressed and compliance is enhanced.

(c) *Electrical licensing committee powers*

A number of powers are proposed to assist the ELC to better fulfil its functions.

(i) First, the ability to defer licence suspensions can allow for the completion of a training course, to ensure that more minor breaches do not unfairly impact the livelihood of workers. Essentially, this will ensure the ELC can take an approach that is proportionate to the circumstances before them, rather than suspensions being a blunt instrument that is disproportionate and has potential flow-on effects for contractors.

(ii) It was raised during the Review that the range of disciplinary options available under section 109 of the Act does not include the ability for the ELC to enter into an electrical safety undertaking. It was considered that particularly where an undertaking promotes electrical safety awareness and engagement including but not limited to Safety Leadership at Work, this would be an effective measure in the appropriate circumstances and should be available to the ELC. It is therefore recommended that changes are made to enable the ELC to enter into an electrical safety undertaking that promotes electrical safety awareness and engagement.

(iii) At section 109 (1)(e) of the Act the maximum number of penalty units that can be imposed by the licensing committee on the holder of an electrical work licence is listed as 40 penalty units. It was raised during the Review the adequacy of this penalty noting the considerable risk a licence holder may cause and the serious consequences on both the workplace and the community. With consideration to this it is recommended that the maximum number of penalty units that can be imposed by the ELC in disciplinary matters is increased.

(iv) During the Review it was raised that under the current electrical safety legislation the ELC are unable to require attendance of an electricity entity in disciplinary hearings concerning an employee of that electricity entity. It was considered where an employee is the subject of a disciplinary hearing that the entity employing the worker should be able to be required to attend the hearing given their significant involvement in the work of the licensee. It is therefore recommended that changes are made to enable the ELC to require attendance of an electricity entity in disciplinary hearings concerning an employee of that electricity entity if deemed necessary.

(v) Division 3 of the Act lays out procedures for taking disciplinary action generally. During the Review it was raised that division 3 does not prescribe the ability for the ELC to enquire the attendance of a PCBU in disciplinary hearings concerning an employee of that PCBU. It was considered that when necessary the attendance of a PCBU was important given they employ the worker they should be aware of the contravention that may have occurred as part of their business and aware of any disciplinary action taken against the worker. It is therefore recommended that the ELC are empowered to be able to require the attendance of a PCBU to a disciplinary hearing concerning an employee of the PCBU.

(vi) Section 106 of the Act lists grounds for taking disciplinary action against licensed electrical workers. During the Review it was raised that neither failure to comply with a direction or notice or failure to rectify a defect as directed were listed at 106 as grounds for taking disciplinary action. It was considered that the severity of these actions was analogous to those listed in s106 and that reasonable sanctioning for these actions was consistent with the sanctions provided by the ELC. It is therefore recommended that grounds for disciplining a licensed electrical worker are expanded to include failure to comply with a direction and failure to rectify a defect as directed.

(vii) The *Queensland Building and Construction Commission Act 1991* contains the concept of an 'influential person for a company'. Under the QBBC legislation an influential person for a company is an individual, other than a director or secretary of the company, who is in a position to control or substantially influence the company's conduct. Section 4AA of the QBCC Act recognises that an influential person does not include a professional, only because the advice given by the professional influences the company's conduct; or a regulator, only because the regulator, when exercising a power or performing a function under an Act or other law, influences the company's business; or an administrator, controller, provisional liquidator or liquidator within the meaning of the *Corporations Act 2001* (Cth), section 9.

It is identified in the legislation that a person may be an influential person for a company if the person—

a. is the chief executive officer or general manager of the company, or holds an equivalent position in the company; or
b. is acting in a position mentioned in paragraph (a); or
c. directly or indirectly owns, holds or controls 50% or more of the shares in the company, or 50% or more of a class of shares in the company; or
d. gives instructions to an officer of the company and the officer generally acts on those instructions; or

e. makes, or participates in making, decisions that affect the whole or a substantial part of the company's business or financial standing; or
f. engages in conduct or makes representations that would cause someone else to reasonably believe the person controls, or substantially influences, the company's business.

The concept was included in the QBCC legislation to help address the issue of "phoenixing" to ensure that a person who is influential in a company failure will be excluded from holding a QBCC licence and be prevented from being in a position of influence in the business of another QBCC licence. The concept recognises the numerous sources of influence that can impact the way activities are conducted in a business or undertaking. Similarities can be identified between this concept and the concept colloquially known as a shadow director contained in the *Corporations Act 2001 (Cth)* section 9. The idea of a shadow director comes from part of the definition of "Director" in the *Corporations Act 2001 (Cth)* where a director of a company or other body means a person who is not validly appointed as a director and the directors of the company are "accustomed to act in accordance with the persons instructions or wishes". This definition depends on how the (appointed) directors of the company or body act in relation to the person's instructions or wishes. Specifically, they must be "accustomed to act in accordance", this requires habitual compliance over a period of time.

During the Review this concept was discussed in the context of disciplinary hearings by the electrical licencing committee. Anecdotally it was noted there had been instances in the past where workers had been subject to disciplinary hearings as a consequence of following instruction by a person of influence. Under the current electrical safety legislation, the concept of an influential person does not exist. The proposal was raised during the Review to consider implementing a concept in the Electrical Safety Legislation similar to "influential person" in the QBCC legislation to ensure those who licence holders are accustomed to act in accordance with are accountable for instruction that contravenes the electrical safety legislation. It was proposed that implementation of this concept could be coupled with empowerment of the ELC to discipline an influential person where they have been found to through influence to contribute to grounds for taking disciplinary action against a licence holder. It was raised that this approach would increase accountability for electrical safety and ensure those were able to influence electrical safety could be held accountable for decisions and instructions that lead to contravention. The Review therefore recommends considering implementing a definition of an "influential person" being a person who has control or has the ability to substantially influence a company's conduct. Further, consider enabling the ELC to take disciplinary action against an influential person in disciplinary proceedings.

(d) *Accredited auditors requiring information*

The Regulator may appoint accredited Auditors under section 129 of the *Electrical Safety Act 2002.* Electricity entities are required to have safety management systems to a specification prescribed by the *Electrical Safety Regulation 2013*. Under section 24 of the *Electrical Safety Regulation 2013* a prescribed electricity entities safety management system must provide for auditing by an accredited auditor at least once every year and at the expense of the prescribed entity, of how the entity is giving effect to the safety management system. During the Review and the recent Supply and Networks paper by

the ESO it was raised that accredited auditors often require specific information from the prescribed entities to fulfil their duties. However currently in the legislation there are no general powers for accredited auditors to obtain specific information should the prescribed electricity entity refuse the request to provide. Noting this significant barrier to ensuring both accredited auditors fulfil their duties and entities are appropriately giving effect to the safety management system, it is proposed that accredited auditors should be empowered to require specific information from prescribed electricity entities where it is necessary to fulfill duties as an accredited auditor. This approach was considered sensible and reasonable by the Review and intends to enable accredited auditors to fulfil their duties as required by the legislation.

(e) ***Power of an Inspector to require person's name and address***

Section 144 of the Act covers the power of an Inspector to require a person's name and address. The use of the word "just" in sub-section (1)(b) creates confusion and potential for differences in interpretation. The context is when a person has "just" committed an offence against the Act. However, as the word "just" is vague and colloquial in nature and is not defined, it may be reasonably interpreted by different individuals in vastly different ways. Removing the word "just" provides the Regulator with the ability to require a person to provide their name and address if the Inspector holds a reasonable belief that the person may have committed an offence against the Act and is not limited to an interpretation of timeframe.

(f) ***Power to require production of documents and answers to questions***

Section 171 of the WHS Act provides greater clarity for the Inspectors who hold a reasonable belief to provide documentation and answer questions in relation to a suspected offence against the Act. Replacing section 141 in the Act with section 171 of the WHS Act will provide Inspectors appointed under the Act with a greater consistency to the WHS Act and inspectorate.

(g) ***Limitation period for prosecutions***

Section 232 (1) (a) of the WHS Act relating to the limitation period for prosecutions, was amended in 2017 from Regulator to WHS Prosecutor following the establishment of the WHS Prosecutor. It is suggested that the ES Act also be amended for consistency.

This would assist Inspectors working across multiple legislative instruments in interpretation and application. Currently matters that come to the notice of the Regulator means the ESO. Amending to WHS Prosecutor means the limitation period for prosecutions would be when the offence first comes to the notice of the WHS Prosecutor.

(h) ***Establishment of the WHS Prosecutor***

Replicating schedule 2, part 4 section 25 of the WHS Act into the ES Act will create greater consistency and reduce the administrative burden on the Office of Industrial Relations to manage and oversee some of the delegations between the Regulator and the WHS Prosecutor by including in the Act. The Act has not been amended following the establishment of the WHS Prosecutor.

(i) ***Misrepresentations about lawful authority to contract for the performance of electrical work***

The repealed section 24A regarding misrepresentation about lawful authority to contact for the performance of electrical work is recommended for reinstatement. The repealed section provides greater clarity to licensed workers, contractors and persons conducting a business or undertaking (PCBU).

This is of particular importance to the ESO to enable effective education and awareness regarding the requirements to hold a relevant licence. Further for effective regulation of electrical contractors and PCBU's to comply with licensing regulations e.g. a company that sells and installs solar panels in must either be an electrical contractor or engage the services of a licensed electrical contractor and licensed electrical workers to carry out the electrical installation.

Recommendation 64: Consider enhancing compliance with electrical safety laws by expanding the regulatory means to discover, prevent and sanction breaches, and to otherwise clarify compliance requirements, by:

(a) making explicit that inspectors have the power to access residential premises for the purposes of examining and assess switchboards (Act, s 140); and

(b) introducing more effective, flexible, responsive sanctioning options, including by:
(i) enabling inspectors to issue on the spot fines consistent with State Penalties Enforcement legislation:
1. if licence conditions are not followed (Act ss 57-57AA), such as Persons Conducting a Business or Undertaking (PCBU) using unlicensed workers; and
2. for noncompliance with an unsafe equipment notice (UEN) (Act s 148), should UENs be retained in the Act (cf. Recommendation 64(b)(viii)).
(ii) considering introducing a sliding scale of fine amounts, to rectify the current lack of proportionality in penalty categories.
(iii) allowing for suspensions or conditions to be placed on licences in the case of unpaid fines
(iv) allowing an avenue for the Regulator to recover unpaid debt via Court order, including order as to costs
(v) clarifying that licensed electrical workers can be penalised for "knowingly" connecting defective electrical equipment (Regulations Pt 3, s 27).
(vi) introducing penalty provisions for the improper use of a licence card, replicating the substance of section 51 of the *Queensland Building and Construction Commission Act 1991*.
(vii) enhancing compliance and clarity with electrical safety laws through the repeal of Division 3 Unsafe equipment notices (Act, s 148 Unsafe Equipment Notice), given the greater effectiveness of issuing Electrical Safety Protection Notices (ESPNs) under section 147; and

(c) clarifying and enhancing the ability of the Electrical Licensing Committee (ELC) to take disciplinary actions, including by:
(i) clarifying that the ELC can defer licence suspensions (Act, ss 109(1)(b))

(ii) enabling the ELC to enter into an electrical safety undertaking that promotes electrical safety awareness and engagement, including but not limited to Safety Leadership at Work (SLAW) (Act, s 109)
(iii) increasing penalties in disciplinary matters for licence holders (Act ss 109(1)(e))
(iv) enabling the ELC to require attendance of an electricity entity in disciplinary hearings concerning an employee of that electricity entity, if deemed necessary (Act, Part 9, Division 3)
(v) enabling the ELC to require attendance of a PCBU in disciplinary hearings concerning an employee of that PCBU, if deemed necessary (Act, Part 9, Division 3)
(vi) expanding the grounds for disciplining a licensed electrical worker to include failure to comply with a direction/notice (Act s 106) and a failure to rectify a defect as directed (Act s 112).
(vii) consider implementing a definition of a "Influential Person" being a person who has control or has the ability to substantially influence a company's conduct. Further, consider enabling the ELC take disciplinary action against an influential person in disciplinary proceedings; and

(d) empowering accredited auditors to require specific information from prescribed electricity entities, to fulfill duties as an accredited auditor (Act s130); and
(e) removing the word 'just' from section 144(1)(b); and
(f) removing section 141 and replacing it with section 171 of the *Work Health and Safety Act 2011* for consistency; and
(g) removing "regulator" in section 186B(1)(a) and replacing it with "WHS Prosecutor", to provide consistency with section 232(1)(a) of the *Work Health and Safety Act 2011*; and
(h) replicating section 25 of the *Work Health and Safety Act 2011,* to provide consistency with the establishment of the WHS Prosecutor in the (Electrical Safety) Act; and
(i) removing section 32 of the Regulations and replacing it with previous provision as per footnote[3]

[3] *Electrical Safety Regulation 2002* (Qld) repealed. **24A Misrepresentations about lawful authority to contract for the performance of electrical work** (1) A person must not, in trade or commerce, represent that someone who is not a licensed electrical contractor may lawfully contract for the performance of electrical work the person may not otherwise perform under the Act. *Example of electrical work that may be performed under the Act by someone who is not a licensed electrical contractor— minor emergency repairs to make electrical equipment electrically safe performed by a licensed electrical mechanic.* Maximum penalty—40 penalty units. (2) An employer must take all reasonable steps to ensure the employer's workers do not contravene subsection (1). Maximum penalty—40 penalty units.

SMS audit arrangements

Section 234 of the *Electrical Safety Regulation 2013* requires a prescribed electricity entity to be audited by an accredited auditor annually "at the expense of the prescribed electricity entity" (s 234(4)(a)). The ESO raised with the Review a potential conflict of interest when engaging an auditor. To address this conflict, the Review has entertained a number of approaches. Ultimately, the Review considers that the Regulator is best placed to determine measures that should be followed by entities. Examples include oversight of procurement processes to engage auditors, to more direct involvement by ESO officers on procurement panels, to the creation of a "taxi rank" of accredited auditors overseen by the ESO to effectively remove choice of auditors from prescribed electricity entities.

Recommendation 65: Consider requiring prescribed electricity entities to remove the potential for conflict of interest when engaging an accredited auditor to undertake the annual audit of their safety management system, by following measures to be set by the Regulator (s 234; Part 14A, Div 1).

Chapter 10: Enhancing safety – specific regulatory issues

As expected, many stakeholders have raised specific regulations that could be amended to improve electrical safety in Queensland. In addition to the matters covered in chapter 9 (above), these specific regulatory issues may fall under the final term of reference for the Review – enhancing safety with evidenced-based reforms. While some of these issues are highly specific, many are also highly significant to ensuring safety. This is reflected in the interest and advocacy of multiple stakeholder groups, as explained in this chapter.

10.1 Safety switch requirements

Under the current electrical safety framework, Queensland leads one of the most comprehensive regimes when it comes to safety switch requirements. Despite Queensland's advanced requirements, the Commissioner's Report noted that many stakeholders were continuing to call for greater safety switch coverage in Queensland. This is reflective of multiple coronial recommendations following the workplace fatalities of workers including Matthew Trent Ross and Dale Kennedy. As presented in Figure 3 (found in section 2.6 of this report), electrical safety related fatalities over the last decade include a number of incidents that the Review understands could have been prevented with safety switches. Of the 32 total fatalities since 2010/11, 12 or roughly a third of all fatalities could have been prevented with safety switches.

The Commissioner's Report listed potential responses to calls for greater safety switch coverage, including a "strict legal rule requiring safety switches on all residential and commercial circuits". The report made both short-term and long-term recommendations in relation to safety switches. In the short term, the report recommended the Queensland Government consider enhancing safety switch requirements on rental properties to ensure vulnerable members of the community are protected. It was noted that this should be explored as part of the Review. In the long term, the report noted that safety switches on all circuits should be required.

Noting the recommendation from the Commissioner's report and coronial recommendations, safety switch requirements were raised by both the Reviewer and stakeholders throughout consultation as an area for potential reform. The issue was discussed, for example, by the WHS Working Group at its meeting on 19 July 2021. During the meeting, the Review acknowledged that all stakeholders were supportive of changes to increase safety switch requirements.

In addition, several stakeholders made submissions in relation to safety switch requirements. NECA expressed support for retrofitting of safety switches on all circuits in domestic residences, rural industrial and commercial premises. MEA sought legislating safety switches on all circuits to include retrofitting on all domestic properties. MEA also cited coronial inquests, including those into the deaths of Dale Kennedy and Jason Garrels, where coronial recommendations included the installation of safety switches on all circuits.

The Consultative Committee for Work-related Fatalities and Serious Incidents also advocated for mandating safety switches, citing coronial recommendations and recommendations from the 'pink bats' royal commission. Further stakeholders who supported the rollout of safety switches on all domestic circuits included the ETU and Stanwell Corporation. However, Stanwell noted any mandatory application of safety switches in industrial three phase applications would be cost prohibitive. Stanwell Corporation did however express support for a process of risk assessment for high-risk industrial work areas and the application of safety switches as deemed required. The Review has considered safety switch requirements beyond domestic settings. In commercial and industrial settings, the Review is aware of implementation challenges both in respect of cost and practicalities.

The WHS Working Group discussed the issue and made an official recommendation to the Reviewer at the meeting on 19 July 2021 to recommend a phased approach to increase mandatory safety switch requirements. Indeed, stakeholder consultation realised broad support for an increase in mandatory safety switch requirements. As noted, this support aligns with coronial recommendations, including the need to cover schools, a necessary protection following the fatality of Dale Kennedy.

The reform proposal – to require safety switches on all sub-circuits in all domestic, commercial and industrial settings, both on and off-grid – will have significant cost implications, particularly in the event where compliance requires replacement of a switchboard for extraneous reasons (e.g. asbestos). The Review's consultation with Energy Safe Victoria provided an insight into potential ways to mitigate cost impact during implementation of such a proposal.

In Victoria, mandatory requirements were introduced in the Residential Tenancies Act requiring that any property offered for rent has all power outlets and lighting circuits connected to a circuit breaker and a residual current device that complies with Australian standards. While this requirement has been introduced, it does not commence until 29 March 2023. This provides a lead in period for compliance with consideration to the cost impacts. The Review explored this phased approach during consultation with Energy Safe Victoria, and this may be canvassed as one way to address cost impacts. In that regard, implementation of this recommendation should consider and mitigate disproportionate impacts on vulnerable consumers. Fundamental to the core of this recommendation is the belief that everyone should be afforded the protections of safety switches, given their pivotal role in preventing loss of life.

While it is beyond the scope of this Review to recommend changes to matters within the responsibility of Queensland Government departments beyond the Office of Industrial Relations, it is desirable– in the interests of consistency – for the safety switch requirements being recommended in this Report to be reflected in the DEPW "minimum housing standards". This matter was raised with officers from DEPW in the course of Review consultation meetings that took place in June 2021.

Recommendation 66: Consider phasing in a requirement for safety switches on all sub-circuits in all domestic, commercial and industrial settings, both on and off-grid. In addition, propose that Government work collaboratively to address potential cost impacts that may disproportionately affect vulnerable consumers.

10.2 Working near energised equipment

The dangers of working near energised electrical equipment extend to electric shock and damage to property. With arc flash incidents continuing to occur in Queensland, the conversation around addressing the safety risks presented by working near energised electrical equipment continues. Under Queensland's current regulatory framework, a person conducting a business or undertaking must ensure that electrical work is not carried out on electrical equipment while the equipment is energised, except in certain circumstances as prescribed in the Regulations. Despite de-energising an electrical installation being worked on directly, the risk remains where the electrical worker is performing work near other energised electrical parts, as evidenced by arc flash incidents.

The Commissioner's Report recommended this area for consideration in a review of the Act, flagging the issue for future reform. The Commissioner's Report acknowledged options to address risk, including further education and awareness campaigns, regulatory amendments to require the de-energisation of electrical installations when electrical workers work near the installations, and amendments to the definition of "electrical equipment" to include a switchboard as a kind of electrical equipment as opposed to installation. The report also noted reforms in Western Australia that make it an offence to carry out electrical work, or cause electrical work to be carried out, on or near an energised part of an electrical installation, subject to two exemptions.

Reforms in Western Australia

Reforms in Western Australia make it an offence to carry out electrical work, or cause electrical work to be carried out, on or near an energised part of an electrical installation, subject to two exemptions. The first exemption concerns situations characterised by four conditions:

a. where there is "no reasonable alternative" to connect to a supply of electricity,
b. where a risk assessment has been carried out by a competent person,
c. where a safe work method statement has been prepared and followed, and
d. where personal protective equipment (PPE) is used as required.

The second exemption is for electrical work on the service apparatus of a major network operator.

Additionally, in Western Australia, it is a mandatory requirement under legislation to comply with the *Code of Practice for Persons Working on or Near Energised Electrical Installations*. The majority of this code is dedicated to guidance on performing electrical work on or near energised electrical installations pursuant to the first exemption set out above. Appendix B to the Code also contains a useful decision-making flowchart for electrical workers to navigate the requirements of the amendments.

During stakeholder consultation, Stanwell Corporation submitted that operational circumstances require work near exposed live parts for fault finding, testing and brush gear maintenance on generates. In undertaking this work Stanwell corporation advised

they apply effective risk management processes to the risks associated with working near exposed live parts and have reduced the need to do this work to a minimum. NECA also advocated for similar provisions to those implemented by Western Australia on de-energisation when working near exposed live parts, but suggested clarification would be needed for places such as hospitals, airports and data centres. The ETU advocated for amendment to sections 14, 15 and 21 of the Regulations, to effectively expand Part 3, Division 1 (Electrical work on energised electrical equipment) to apply to work not only *on* but also *near* energised electrical equipment.

After considering the canvassed options, regulatory amendments to require the de-energisation of electrical installations when electrical workers work *near* the installations is the most favourable mechanism of reform. This outcome accommodates submissions from the ETU, NECA and Stanwell Corporation. Going beyond awareness and education, the favoured regulatory amendments represent precise changes without adding complexities and the potential unintended consequences that come from changing a definition for a narrow purpose and most importantly provides the necessary protections to workers.

It was noted also during the Review that the proposed regulatory changes broadly resemble those undertaken by Western Australia, which provide clear guidance. It will also be necessary to consult with industry to finalise any preferred mechanism for reform. However, consideration should be given to adequately maintained, calibrated and tested PPE, as well as the use of technological aides such as thermography and airborne ultrasound sensors.

Recommendation 67: Consider introducing a requirement for de-energisation prior to work near energised parts of an electrical installation, subject to necessary exemptions for energised work, such as testing for defects or faults in accordance with a risk assessment, safe work method and with appropriate Personal Protective Equipment (PPE).
(a) further consider the introduction of requiring specific PPE when this work is undertaken including the required standard for working near exposed live parts (in accordance with Energy Safe Victoria's Arc Flash Hazard Management fact sheet); and
(b) consideration is also to be given to requiring the PPE to be maintained and calibrated and tested to ensure it has the required integrity as per Australian Standards and is fit for purpose for use; and
(c) consider implementing in the Regulations minimum standards for specific technologies such as thermography and airborne ultrasound sensors to ensure the safety of persons conducting electrical safety inspections on electrical installations.

10.3 Working in roof spaces

Between 2009 and 2010 under the Federal Government's Home Installation Program, three young workers lost their lives at work in Queensland whilst installing insulation in roof spaces. In all three cases, the roof space of the residential property was not de-energised prior to undertaking work. These heartbreaking tragedies are a permanent reminder for the need for policy reform to address this significant electrical safety issue.

The de-energisation of roof spaces has long been a topic of discussion following the coronial inquests of Matthew James Fuller, Rueben Kelly Barnes and Mitchell Scott Sweeney. During the inquest there was a divergence of opinion as to whether the roof spaces should be isolated from the electrical supply when work is being carried out. The coroner noted in the inquest that workplace health and safety agencies failed to proactively respond to the increased risk posed by primary failings in the planning and implementation of the Housing Insulation Program. The Coroner recommended a review of why the increased risk occurred and how it be avoided in the future amongst a number of other recommendations including a public awareness campaign regarding the risk of electric shock when entering a roof space.

The issue of roof spaces was recognised in the Commissioner's Report, recommending the Queensland Government should investigate ways to mandate the de-energisation of residential buildings before work can commence in their roof space, noting further consultation on the issue is required (at [9.2]). The report also considered the de-energisation of commercial roof spaces however deemed this measure would not be practical citing considerable issues if this concept was applied to hospitals, 24-hour manufacturing plants, major hazard facilities, in addition to shopping centres which would result in spoilt goods, food safety implications and a loss of important services.

Roof spaces was raised during consultation both in the public submission process by key stakeholders and during the WHS Working Group meeting where it was identified as a key issue for group consideration.

During the public consultation process Stanwell Corporation expressed support for complete isolation of domestic installation roof spaces before work is performed. Further, Stanwell Corporation noted they did not perceive it to be practical to mandate complete isolation of roof spaces for commercial or industrial buildings given the multiple feeds and impact to safety and operation of the associated business. In place of this they advocated a risk assessment be conducted that addresses the removal of electrical supplies that can practically be removed and that provide the maximum safety whilst maintaining business continuity.

A further submission in relation to the issue was provided by the Consultative Committee for Work Related Fatalities and Serious Incidents. The submission noted the ESO's and WorkSafe Queensland's alerts to workers warning of the dangers of working in ceiling spaces, noting the only definite power a worker has to de-energise a building is for the action to be made mandatory. Acknowledging the exceptional circumstances that may exist where it is not possible to de-energise the building, the committee submitted that a well-considered risk assessment and the presence of a safety switch would be critical in this scenario.

The WHS Working group also briefly discussed the issue where it was noted that there was broad support for mandating de-energisation of domestic ceiling spaces however the issues posed by commercial installations as raised in the Commissioner's report were acknowledged.

With broad support for the mandating of de-energising of domestic roof spaces prior to work in or via the roof space, implementation of this recommendation would be an effective increase of protections for workers. Consistent with recommendations from the Commissioner's report and submissions from key stakeholders during the consultation process, consideration was given to the practicality of extending the mandate to commercial and industrial roof spaces. In contrast to the de-energising of domestic roof spaces, the de-energising of commercial and industrial roof spaces could pose significant issues. Given the adverse consequences of extending this requirement top commercial and industrial roof spaces it is proposed that an approach similar to that provided by the consultative committee for work related fatalities and serious incidents and Stanwell Corporation would be a more appropriate measure. This measure both acknowledges the risk and requires a proportionate approach in managing that risk to afford the necessary protections of workers whilst accommodating the complexities and the varied nature of industrial and commercial installations.

It is noted that in 2019, OIR developed an Amendment Regulation to improve electrical safety in residential roof spaces, by requiring a person conducting a business or undertaking to de-energise a residential building's electrical installation prior to work in or via the building's roof space. The Amendment Regulation also required that workers must not work in residential roof spaces that have not been de-energised. WHSQ consulted with a broad range of internal and external stakeholders on the Amendment Regulation in March and April 2019, with broad support. The Amendment Regulation was put on hold in mid-2019 but is now back on the table as part of the Review. The Amendment Regulation prepared by WHSQ is consistent with the recommendation made by the Reviewer.

Recommendation 68: Consider mandating a requirement for de-energisation of domestic roof spaces prior to work in or via the roof space, and require a safe work method statement, a documented risk assessment that includes the appropriate PPE on commercial and industrial roof spaces if de-energisation is not reasonably practicable.

10.4 Electrical safety property inspections and certificates

In its broadest intentions the purpose of the Act is to establish a legislative framework for preventing persons from being killed or injured by electricity and preventing property from being destroyed or damaged by electricity. Central to these two concepts is residential electrical safety or more simply electrical safety at home. As part of the Review, the Reviewer considered protections afforded to Queenslanders in their home environment. Of note with the inclusion of Industrial Manslaughter in the Electrical Safety Regulatory framework, landlords conducting a business, or a rental house are obligated to ensure that the rental accommodation is electrically safe. Management of electrical risks in residential premises to occupiers was raised during consultation.

During the public consultation process Master Electricians Australia raised the matter of electrical inspections upon the sale or rental of a domestic property. The submission referenced changes by the Victorian Government through the Residential Tenancies Act. These changes initiated the requirement for an electrical inspection every two years or upon change of tenants. MEA supported the approach taken in Victoria labelling it a

sensible approach that will improve electrical safety of tenants particularly those who are vulnerable. MEA also noted the decision for recalled products such as infinity cable to be left in situ if relevant circuits are protected by safety switches. MEA suggested this contributed to the need for inspections to ensure that remaining infinity cable and other recalled electrical equipment is safe.

EQL recommended amendments to the Regulations to include a requirement for residential electrical installations to be inspected prior to the sale of a premises to ensure installation and wiring are electrically safe. EQL compared the recommended measure to the likes of safety switch requirements, pool fencing regulations and smoke alarms.

The ETU also submitted to the Review in relation to residential electrical safety issues, seeking for the introduction of a requirement for all homeowners to replace asbestos switchboards within a fixed period of time, noting the hazard these boards pose to electrical workers and their families. A survey taken by the ESO in 2016 indicated 15% of switchboards required replacement due to asbestos. Whilst this figure is dated and no longer accurate, it is indicative of the continuing presence of switchboards containing asbestos in Queensland.

Electrical inspections of properties at point of sale represents a convenient opportunity to ensure that incoming residents are not exposed to electrical risk. Given the risk of unlicensed work in the community and recalled electrical equipment, an electrical safety certificate ensures the electrical safety of residents and is aligned with the purpose of the Act. It is considered that such measure would afford the community greater electrical safety and provide new homeowners comfort and confidence.
Further to the requirement of a point-of-sale certificate a complementary recommendation seeks an electrical safety inspection on all properties every 5 years. This captures those properties that have not been subject to a certification process through sale. This inspection requirement would ensure that all properties are checked at regular intervals to ensure they are safe and complaint. Inspections also provide an opportunity for the identification of asbestos switchboards; it is proposed that where switchboards containing asbestos during the inspection that homeowners are given a specified period of time to replace the switchboard. This is considerate of the risk posed by an asbestos switchboard and the cost incurred to replace it. This recommendation also caters to future changes to legislation and standards that do not apply to existing installations, this creates a situation where installations fall far behind current standards and impact electrical safety. This recommendation will ensure future important safety standards are eventually incorporated in all electrical installations. This will also provide an opportunity to ensure the safety of recalled equipment in situ and affords improved electrical safety to the rental market and the more vulnerable members of the community.

Recommendation 69: Consider introducing a phased-in requirement for an electrical safety certificate to be issued by a licensed electrical worker, initially at the point of sale of a property and later every 5 years, confirming the property's electrical installation is safe and compliant with electrical safety standards and legislative requirements including, for example, safety switch requirements.

Recommendation 70: Consider a phased introduction of a requirement for a licensed electrical worker to perform an electrical safety inspection on all properties within five

years of commencement of this requirement, and thereafter within five years of the last electrical safety inspection or receipt of an electrical safety certificate [see Recommendation 69, directly above], whichever is later.
(a) it is further recommended for consideration that where an inspection identifies asbestos panels and boards within electrical switchboards, the homeowner must replace to meet current standards. It is suggested that homeowners have up to two years from the date of initial identification to rectify.

10.5 Consultation when building near public infrastructure

Through the course of the Review anecdotal evidence was raised where building plans have gone ahead without consultation with prescribed entities resulting in adverse impact to public infrastructure. This issue was also raised in the recent Supply and Networks paper by ESO where the potential for future risk to public safety and network access issues (obstruction to infrastructure) was flagged. The Reviewer raised the issue during consultation to seek feedback on an approach that could mitigate the risk of this continuing in the future.

It is noted that under the current legislation section 209 (2) of the *Electrical Safety Regulation 2013*, the person must before the work starts, give the electricity entity whose works include the electric line written notice in a form approved by the electricity entity. Noting anecdotal evidence of adverse impact to public infrastructure due to an absence of consultation, the Review considered that the current framework was ineffective and required additional rigor.

The ESO proposed a solution to the inadequacy of the current framework, suggesting a strengthening of section 209, including enforcement action, penalties and remediation actions, similar to the approach taken in New South Wales.

<u>New South Wales approach</u>

Electricity Supply Act 1995 section 49

49 Obstruction of electricity works

(1) This section applies if a network operator has reasonable cause to believe that any structure or thing situated in, on or near its electricity works—

(a) could destroy, damage or interfere with those works, or

(b) could make those works become a potential cause of bush fire or a potential risk to public safety.

(2) In those circumstances, a network operator—

(a) may serve a written notice on the person having control of the structure or thing requiring that person to modify or remove it, or

(b) in an emergency, may, at its own expense, modify or remove the structure or thing itself.

(3) A notice under subsection (2) (a)—

(a) must specify the work to be carried out, and

(b) must specify a reasonable time within which the work is to be carried out.

(4) If the person fails to carry out the work in accordance with the requirement, the network operator may carry out the work itself.

(5) The costs of—

(a) carrying out the work, and

(b) repairing any damage done to the network operator's electricity works by the structure or thing, may be recovered by the network operator in a court of competent jurisdiction as a debt owed to it by the person.

(6) A network operator may apply for an injunction to prevent a structure or thing being placed in, on or near its electricity works.
(7) A network operator may take action under this section even if the person having control of the structure or thing owns or occupies the land in, on or over which the network operator's electricity works are situated.
(8) Subsection (5) does not enable the network operator to recover any costs referred to in that subsection from a person referred to in subsection (7)—
(a) where the electricity works are works to which section 53 applies, if the structure or thing had been lawfully placed in its present position—
(i) before the commencement of the Electricity Supply Amendment (Protection of Electricity Works) Act 2006, or
(ii) after the commencement of that Act, but with the agreement of the network operator, or
(b) in any other case, if the existence of the structure or thing in its present position does not contravene the terms of any easement, agreement or other authority that supports the presence of the electricity works in, on or over the land.
(9) In the circumstances referred to in subsection (8)—
(a) the costs referred to in subsection (5) are to be borne by the network operator, and
(b) the network operator is liable to the owner of the structure or thing for any loss or damage suffered by the owner as a consequence of the work referred to in subsection (4).

Energy Queensland also raised the issue during consultation, advocating for changes to ensure that persons and PCBUs do not build structures in breach of clearance requirements and that persons approving the buildings of structures do not approve or certify structures in breach of clearance requirements. During the one-on-one consultation Energy Queensland noted that where structures encroach on safe zones this results in significant costs to the entity which in practice is the diversion of funds and human resourcing from more crucial work.

The Review proposed that a requirement could be added mandating builders' application processes to include a certificate to be issued by prescribed entities confirming building plans will not be adversely impact public infrastructure. This ensures that electricity entity approval is sought in the process and aims to prevent further damage to infrastructure. This measure aims to mitigate the risk of structures being constructed causing adverse impacts to public infrastructure and does not rely on further acquisition of knowledge by those who approve the building of structures or those who build structures. This would represent a strengthening of section 209 as sought by ESO however represents an alternative approach to that taken by New South Wales. The fundamental intent behind this proposal is to reduce the needless diversion of funds and human resources by electricity entities, increase in risk to public safety and network access issues and provide for better planning and consultation during the building process.

Recommendation 71: Consider introducing a requirement for builders' application processes to include a certificate to be issued by the relevant electricity entities, confirming building plans will not adversely impact any adjoining electricity infrastructure prior to building work commencing. Further it is suggested consultation across agencies will be required to effectively implement this change.

10.6 Record keeping at sale of specific electrical equipment

Unlicensed electrical work continues to be a key concern for the Regulator with the ESO recently running a "don't do it yourself (DDIY)" campaign to educate the public on their legal obligations and the multitude of risks involved in unlicenced electrical work. Many key stakeholders in the electrical sphere share the concern for unlicenced electrical work. It was noted during the Review with technological developments over the last two decades, the arrival of online marketplaces such as Gumtree and Facebook Marketplace and the endless access to information via the web has made for a dangerous combination when it comes to unlicensed work. One measure that was canvassed during consultation was registering the sale of products requiring installation by a licenced electrical worker. It was considered that this would deter unlicensed electrical work, provide useful data when investigating unlicenced work and provide assistance with recalls of electrical products. This issue was discussed in great length during consultation.

During the public submission period Master Electricians Australia advocated for the registration of sale of electrical licenced products sold at retail outlets to facilitate product recalls and address unlicensed do it yourself electrical installation work. MEA cited the infinity cable recall where 4,000,000 metres of cable has still not been located due to sale through a retail hardware store. MEA also referenced a number of deaths across the country of consumers and tradespeople from DIY electrical installation work.

NECA advocated for the Act and Regulations to restrict sale of certain electrical equipment to licenced electricians and contractors with stronger controls placed on online marketplaces. This issue was also raised by the Reviewer for consideration by the manufacturing wholesale and retail working group for consideration. The group discussed an approach of limiting the sale of goods to only those with an electrical licence. Limitations of this approach were discussed including creating market capture, limiting market competition and removing the opportunity for consumers to purchase products for licensed electrical workers to install. The group discussed a registration approach that would not limit the purchasing/sale of goods but would require the purchase to provide details and the seller to record them. This approach also involved the supply of this data to the Regulator for investigative and recall purposes. The group discussed the vast number of items that consumers can purchase that require installation by a licensed electrician and whether a registration approach would be necessary for all goods that require licensed installation. The group discussed that a narrow list of items requiring the registration of sale would more appropriate excluding items such as ceiling fans but including items such as cable noting this was a stronger indicator of unlicensed work. The working group agreed a defined list of electrical equipment to request wholesalers and retailers to retain purchaser records was a good approach and recommended the Reviewer consider this approach in the Review.

The registering of consumers at point of sale of specific electrical equipment that requires a licensed electrical worker for installation is a measured and proportionate approach. This approach provides for increased community safety through a more effective recall process in the event electrical equipment requires recall, in addition to serving as a deterrent to consumers to undertake unlicensed electrical work. Furthermore, where this approach is not effective in preventing unlicensed electrical work, the data gathered in the purchasing process may assist the Regulator through investigative and auditing processes.

The Review discussed items that would be appropriate to capture by a record keeping requirement, with consideration to ensuring the requirement was proportionate and restricted to instances where purchasing may be indicative of performing electrical work due to the nature of the item and its use limited to electrical work. The Review suggested that items that may be captured by the requirement could include:

- Electrical cable sold on drums per meter
- Enclosures (add details)
- General purpose outlets / socket outlets
- Switchboard enclosures
- Isolation switches
- Main switches

The Review also considered the repeated purchase of multiple units of electrical equipment that require installation by licensed electrical workers, e.g. fixed wired appliances such as air conditioners, stoves, etc. Noting that where this went extensively above quantities for personal use it should trigger a record keeping requirement.

Recommendation 72: Consider the introduction of record keeping by the wholesaler or retailer at the point of sale of prescribed electrical equipment, being equipment that must be installed by a licensed electrical worker. Prescribed electrical equipment would include specified fixed wired electrical accessories, components and electrical appliances. The purchaser's name and address or other contact information and the specific equipment purchased must be recorded. It is recommended these records should be made available to the Electrical Safety Office on request for the purposes of regulatory activities such as assisting with recalls and identifying unlicenced electrical work in the interest of electrical safety.

10.7 Further issues and recommendations

Beyond the key, specific regulatory issues raised in this chapter, both consultation on the Review and the voluminous departmental issues register give rise to a number of recommendations that encompass what could be considered more minor, though far from insignificant, changes. Given the number of these matters, they are structured as clarifications, updates or enhancements to the various parts of the Regulations. Parts 5 to 15 of the Regulations are traversed in turn, with the concluding recommendations focusing on administrative amendments due to errors or drafting oversights.

A. Electric lines (Part 5)

The regulation of electric lines is covered by Part 5 of the Regulations. The Review sees several opportunities to clarify and enhance electric lines regulations to ensure avoidance of contact with electric lines and the integrity of electricity infrastructure.

(a) *Service line definition*

It was raised during the Review that at section 76, service line of the Act that a definition clarifying the scope of a "Service line" is not provided. It is noted that at section 79,

overhead electric line is defined to assist with the interpretation of s79. It is proposed that to assist with the understanding of section 76 a definition for service line is provided. It is recommended that this definition is clarified with consideration to the definition provided for overhead electric line and its application. It is therefore recommended that the scope of a "service line" is clarified noting the definition of overhead electric line.

(b) ***Demolition requirements***

During the Review issues were raised in relation to demolition work and unauthorized removal/and or relocation of electricity meters by electrical contractors creating electrical shock risk or fire. It was proposed during the Review that one potential remedy to this would be clarifying the requirements for demolition companies to register with electricity retailers to request line/meter removal. This would provide protections to prevent unauthorized removal and/or relocation of electric lines and electricity meters. It is therefore recommended that requirements for demolition companies are clarified to require registration with electricity retailers to request line/meter removal.

(c) ***PCBU clearance requirements***

It was noted during the Review and in the recent ESO Supply and Networks paper that there have been numerous instances of building within statutory clearance requirements causing increased risk during construction and responsibility placed on the entity to fix infrastructure after construction is completed. This also has further implications including a future risk to public safety and network access issues as a consequence of obstruction to the infrastructure. It is therefore recommended that a requirement is introduced to keep structures outside clearance requirements including for PCBUs to ensure any builder it engages to construct a structure to not do so within clearance requirements.

(d) ***Dial before you dig***

During the Review it was raised that the number of incidents of contact with underground electrical lines were increasing, it was noted that this issue was also raised in the ESO Supply and Networks paper. When looking at other jurisdictions, it was noted that NSW implemented mandatory dial before you dig which is applicable to electricity and gas infrastructure.

To prevent the risk of accidentally coming into to contact with underground electric lines, the physical location of the electric lines needs to be identified through a variety of actions including manual excavation, hydrovac (pot holing) and engaging the services of location services such as dial before you dig. Noting that dial before you dig does not cover privately owned electric cables and that certified locator services may be required.

Dial before you dig is a free service and during the Review it was discussed that this would be a reasonable measure to require prior to underground work to prevent incidents of contact with underground cable. It is therefore recommended that "dial before you dig" is required prior to excavation work (i.e. underground work that is not of a superficial nature, e.g. gardening), to prevent incidents of contact with underground electrical cables.

(e) ***Fires and electric lines***

During the Review Powerlink raised the significant threat fire poses to electrical safety noting it has the real potential to electrocute persons nearby a flame or conductive smoke columns where it contacts high voltage electric lines even at distances of 25 metres. Powerlink also noted in their submission that the 'flashover' events can also interrupt the supply of electricity and damage the transmission network. With respect to this it was noted that the management of controlled burns is an important safeguard for landholders, workers and the community

With consideration to the aforementioned issues posed by controlled burns, it is recommended that persons planning fires within a specified distance of lines (e.g. 25 metres) to consult and cooperate with the relevant electricity entity for those lines.

(f) ***damaging assets***

It was raised during the Review and in the ESO Supply and Networks paper that there has been a number of occurrences in the past where PCBUs have come into contact with electricity network assets causing damage to infrastructure resulting in an unsafe network. It was proposed during the Review that a mechanism such as an offence be introduced to act as a deterrent to these incidents occurring and thus improving PCBU workplace planning and safety. It is therefore suggested that an offence is introduced to cause damage to electrical infrastructure/an entity's assets to cause, or risk unsafe condition/network including in relation to overhead or underground electric lines and climbing poles.

(g) ***modern grain harvesters***

Crucial to ensuring no unintended contact with electric lines is maintenance of appropriate exclusion zones, including for different kinds of vehicles and plant. To this end, special exclusion zone requirements apply to "operating plant", which is defined to mean (underline added):

> ***"...*** plant being operated for its intended purpose, unless the operation of the plant can not materially affect the distance between the plant and any overhead electric line for which there is an exclusion zone under part 5 and schedule 2.
>
> *Examples of operating plant—*
>
> • a tip truck tipping a load
>
> • a fixed crane operating at a building site
>
> • a vehicle that includes an elevated work platform used for clearing vegetation from around overhead electric lines
>
> • a concrete pumping truck pumping concrete
>
> • a harvester with height changeable attachments used to transfer grain to a truck
>
> *Example of plant that is not operating plant—*
>
> a furniture removal van under an overhead electric line raising or lowering the electrically or hydraulically operated platform located at the rear of the van, if neither the platform nor anything on the platform rises above the roof of the van

Exclusion zones for "operating plant" are larger than exclusion zones for "vehicles". The rationale is evidence in that key to the definition of "operating plant" is movable parts that may unintentionally contact electric lines. The example of "a harvester with height changeable attachments used to transfer grain to a truck" makes this clear. Given the distinction between "operating plant" and "vehicle", Agforce advised the Review that the design of grain harvesters has changed significantly over time and that the arms do not move vertically, meaning the height of the harvester does not change. Agforce advocated for a grain harvester with grain transfer attachments retracted being viewed as a "vehicle" for the purpose of exclusion zone requirements.

As a starting point, the Review notes a concern that electrical fatalities are higher in the rural industry, which as a general rule should observe robust safety standards. The Review also notes that the wording of the example of a harvester refers to harvesters "with height changeable attachments". If modern harvesters contain arms that do not move vertically, they will not be captured by this example. If, however, they do contain such attachments, but they are retracted and mechanically locked to avoid unintentional raising, there is a case for altering the example. The Review recommends that the potential alteration of the example of harvesters within the definition of "operating plant" be consider for more nuanced amendment in view of the practical operation of modern forms of this equipment.

Recommendation 73: Consider clarifying electric lines regulations (Regulations, Part 5) to limit the occurrence of contact with electric lines and the integrity of electricity infrastructure, by considering:

(a) clarifying what is within the scope of a "service line" (s 76), noting the definition of overhead electric line (s 79(2))
(b) clarifying requirements for demolition companies registering with electricity retailers to request line/meter removal
(c) requiring PCBUs to keep structures outside clearance requirements (Schedule 4, s 69), including for PCBUs to ensure any builder or contractor it engages to construct a structure, to not do so within clearance requirements
(d) requiring duty holders to carry out location activities for underground electric lines including by manual activities, sourcing services (where required) and "dial before you dig" prior to excavation work (i.e. underground work that is not of a superficial nature, e.g. gardening on private property), to prevent incidents of contact with underground electric lines (s 68).
(i) It is further recommended to remove the reference to underground electric lines in the Regulation at s 68(1) and creating a third sub-section to mirror requirements in the *Work Health and Safety Regulation 2011* s 304.
(e) requiring persons planning fires near and adjacent to electricity infrastructure within a specified distance of lines, to consult and cooperate with the relevant electricity entity for those lines
(f) creating an offence to cause damage to electrical infrastructure/an entity's assets to cause, or risk, unsafe condition/network, including in relation to overhead or underground electric lines (Pt 5) and climbing poles (Pt 15, s 278)
(g) reviewing the wording of the example of harvesters in the definition of "operating plant" (Regulations, Sch 9), to ensure the example is adapted to the functioning of

modern grain harvesters, particularly those with attachments that do not move vertically or are retracted and therefore pose a lower risk to electric lines.

B. Electrical installations (Part 6)

Part 6 of the Regulations covers electrical installations. The Review has considered several ways to clarify and enhance the regulation of electrical installations and electrical installation work.

(a) *Safety switch requirement applicability*

Under section 84 of the Regulation one of the qualifying requirements to apply section 84 is for general purpose socket-outlet to have been installed in the domestic residence on the land before 1 June 1992. It was proposed during the Review that the date should be removed in this provision to ensure safety switch requirements apply to outlets generally. It is therefore recommended that the date (1 June 1992) is removed to ensure safety switch requirements apply to outlets generally at ss84-85.

(b) *Work standards*

Section 70 of the Regulations requires a licenced electrical worker who performs electrical work on an electrical installation must ensure the electrical installation to the extent it is affected by the electrical work, complies with the wiring rules. It was raised during the Review that the limitations of this provision include its narrow scope of the wiring rules and its failure to mention standards that are referred to in the wiring rules and other applicable standards that may apply to the scope of work being performed.

It is noted that other provisions in the Regulations refer to "applicable standards" as a mechanism to broaden the scope. An example of this can be found at s 201 of the Regulations. It is proposed that a similar approach is taken with s 70 to extend the requirements beyond the wiring rules to include other applicable standards. It is therefore recommended to require licensed electrical workers to comply with applicable standards in addition to the Wiring Rules (s 70).

(c) *Water equipment work*

As part of the background to this Review of the Act, reference has been made to the matter of *Maryrorough Solar Pty Ltd v The State of Queensland* [2019] QSC 135 (see 6.1). The Supreme Court of Queensland found section 73A of the Regulations to be invalid and has since been removed.

The primary judge found that s73A was "not specifically authorised by the Act" because it "is inconsistent with provisions of the Act about licensing people to do electrical work". The Court of Appeal agreed unanimously, setting out its core reasoning as follows (*State of Queensland v Maryrorough Solar Pty Ltd* [2019] QCA 129, para [17]):

> The Act comprehensively defines the work for which an electrical licence is required such as to leave no room for modification by delegated legislation.

> Section 73A would involve "a new step in policy" which cuts across that aspect of the Act by requiring a licence for work that is not "electrical work".

Section 73A was drafted in very similar in terms to section 72. Section 72 prohibits work involving water equipment without an electrical work licence. The section describes that work in hypothetical terms, *as if* it were electrical work/work on electrical equipment even though the relevant equipment being worked on does not fall within the definition of "electrical equipment".

To explain further, "water equipment" is defined by reference to "a swimming pool, paddling pool, spa pol, water feature or water tub" (sub-s 72(3)). The Explanatory Note to the Regulations provides two examples of the practical application of s 72:

> "a person must not install a 12V light fitting in a swimming pool unless they are a licensed electrical worker who would be authorised to perform work of that type on electrical equipment".
>
> "a person would be able to replace parts of a chlorinator operating at 12V which is designed to be replaced by a person without electrical knowledge or skill, without being a licensed electrical worker".

Somewhat analogously to the concept of ELV equipment in a hazardous atmosphere being deemed "electrical equipment" (Act, s 14(1)(c)), it appears that water is considered hazardous and therefore despite ELV equipment being involved there is an intent to regulate work on water equipment. However, at present, there appears to be no basis for this in the Act. Like the invalidated section 73A, section 72 appears to create a de facto licensing regime that is inconsistent with the Act.

The proper regulation of water equipment can be achieved by providing a basis for it in the Act, such as by explicitly including "water equipment" within the definition of electrical equipment, as an exception to the general ELV threshold (Act, s 14(1)), or by explicitly including work on water equipment within the definition of "electrical work" (Act, s 18), as an exceptional category despite water equipment not being "electrical equipment".

The same is true for section 73, concerning electric motors, which is framed in the same way as section 72 (and the invalidated section 73A). Therefore, should there be a desire to maintain section 73 (consider parallel reforms proposed at 6.3(B) of this report) a legislative basis in the Act should also be constructed.

Finally, it may be useful to note the commencement and enforcement history of section 72. Section 72 commenced on 1 January 2014 with the commencement of the *Electrical Safety Regulation 2013* (apart from sections 1-2). The Review understands no notices have been issued by the Regulator under section 72. Prior to 2014, section 68 of the *Electrical Safety Regulation 2002* contained the same provision, which commenced on 1 October 2002. Under section 68 of the 2002 regulation, nine notices were issued between 2002 and 2013, comprised of three improvement notices and six electrical safety protection notices.

(d) ***Insulation of electric lines***

It was raised during the Review that some of the examples provided at section 76 of the Regulations are outdated, for example 'J' hooks are no longer permitted on facias or poles. It was proposed during the Review that examples should either be updated or removed. With consideration to the assistance that examples can provide, it is recommended that the examples provided for facilities that may be provided for a person in control be updated.

(e) ***Independent earth electrode***

During the Review, Energy Queensland Limited (EQL) advocated for requirements for licensed electrical workers or licensed contractors to confirm, prior to undertaking electrical installation work on an electrical installation installed in a domestic premise, the installation of an independent earth electrode. EQL sought these changes to reduce the likelihood of electric shock related incident within the residential installation by converting those older instillations with galvanized water pipe where the integrity of protective earth is dependent on the metallic water pipes. EQL noted retro fit plumbing activity often results in the metallic pipe being replaced with non-conductive PVC piping. This presents an ongoing risk to the resident and the plumber when performing work to retrofit where the plumber may be exposed to hazardous voltages in circumstances where the service or network neutral integrity is compromised. EQL noted in their submission that there had been fatalities in the past arising from this situation.

Noting this amendment will ensure that property related transactions are inclusive of requirements to confirm that a property has a protective earth, it is recommended that requirements are introduced requiring a licensed electrical worker or a licensed electrical contractor to confirm, prior to undertaking electrical installation work on an electrical installation installed in a domestic premise, the installation of an independent earth electrode (s 86).

(f) ***Rectifying defects***

Section 74 of the Regulations contains a requirement for a person in control to fix a defect. The trigger to this requirement is an inspector or electricity entity giving written notice of a defect. For licensed electrical workers and contractors, only the ELC can direct the rectification of faulty work through conditions imposed in a disciplinary hearing. This was noted by the *Commissioner's Report* at section 3.2, which recommended strengthening the provision. The ESO has raised one matter with the Review in this regard. This entails clarifying that "agents of an entity" are relevantly engaged. The Review is agreeable to this proposal.

Recommendation 74: Consider clarifying and enhancing standards that apply to electrical installations (Regulations, Part 6), including by considering:

(a) removing the date (1 June 1992) to ensure safety switch requirements apply to outlets generally (ss 84-5)
(b) requiring licensed electrical workers to comply with applicable standards in addition to the Wiring Rules (s 70)

(c) ensuring there is a legislative basis in the Act for regulations concerning work involving water equipment (s 72), and, if it is to be maintained, work involving electric motors (s 73)
(d) updating the examples of facilities that may be provided by a person in control (s 76)
(e) requiring a licensed electrical worker or a licensed electrical contractor, prior to undertaking electrical installation work in a domestic premise, to confirm the existence of or install an independent earth electrode (s 86)
(f) strengthening requirements on persons in control to fix defect through the inclusion of "agents of an entity"

C. In-scope Electrical Equipment / EESS (Regulations, Part 7)

Equipment safety is integral to the Act. The safety of household electrical equipment is regulated by way of the "in-scope electrical equipment safety scheme", or EESS (Act Part 2A, Regulations Part 7). Queensland's ESO has significant experience both implementing the EESS and coordinating within interstate counterparts on the functioning of the EESS. This experience over many years gives rise to numerous proposals to improve the EESS to better achieve its intent. Several specific topics are explored below, which may animate future consideration of amendments to the EESS as it is implemented in Queensland. Given the technical nature of these discussions and the focus of the present Review of the Act on technological change, a broad recommendation is made to consider these matters further, rather than making individual recommendations on numerous sub-topics. Appendix 10 contains discussions of various areas for potential reform.

Recommendation 75: Consider clarifying and enhancing in-scope electrical equipment-related standards and sanctions (Act, Part 2A; Regulations Part 7).

D. Unsafe electrical equipment (Regulations, Part 8)

Part 8 of the Regulations covers the regulation of unsafe electrical equipment. The Review sees opportunities to better ensure removal of unsafe equipment from sale, appropriate notifications are made, relevant documentation kept, and other matters to assist with the regulation of unsafe electrical equipment, as explained below.

<u>Responsible suppliers</u>

(a) *Record keeping*

Currently, a "responsible supplier" must keep evidence proving that items being sold meet the relevant standards for that type of in-scope electrical equipment (ss 147(2), 148(2)). Specifically, the Regulations require responsible suppliers to keep documentary evidence (s 147) or a compliance folder (s 148), depending on the level of the equipment. These records must be kept for the "prescribed period", which is defined differently for level 1 and level 2 electrical equipment but is at least 5 years in length. The ESO is of the view that, presently, the regulations are not prescriptive enough in terms of what must be kept. The ESO suggested that reference could be made to specific documentary

evidence, including, for example, test reports, safe use instructions, and circuit diagrams. The Review agrees that specificity would assist in ensuring documentation kept is adequate.

(b) *Advising clients*

Division 2 of Part 8 covers the topic of prohibitions on sale of electrical equipment and empowers the Regulator to prohibit the sale of use of electrical equipment on safety grounds (s 192). Sub-section 192(3) requires the Regulator to give an information notice for the decision to each person the Regulator knows to be, or is likely to be, a seller of the item or type. While this requirement is important, it is easily conceivable that the Regulator does not have knowledge of every person selling the item in question. In contrast, a "responsible supplier" may be in a position to know of further sellers. It is therefore reasonable to not only require responsible suppliers to cease selling the item, but to also inform clients (who have been sold the item) of the need not to sell it on to other businesses or consumers. Given the importance of stopping the on-sale of unsafe equipment, it is reasonable to attach a proportionate penalty to responsible suppliers failing to inform clients not to on-sell. In the context of section 192, that could be equal to or less than 40 penalty units.

Officers

(c) *Officer duty – recall*

The recall of unsafe electrical equipment is provided for in Act, being enforceable by the Minister. The ESO advocated for expanding recall power, specifically in an attempt to prevent liquidations as a means of avoiding recall duties. The ESO has experienced issues in this area, such as in relation to Avanco's DC isolators, as well as Infinity Cable. The ESO suggested placing recall duties on officers of the relevant company, e.g. a director. The ESO noted that Victorian legislation may assist in providing a legislative approach to this issue. The Review is of the opinion that this matter should be considered further, while noting the necessity of consistency with duties place on officers and duties in the context of liquidations as set out in the *Corporations Act 2001* (Cth).

Retailers

(d) *Ceasing sale*

At present, requiring the cessation of sale of unsafe electrical items is directed at *each item, each time.* Section 192 of the Regulation provides the ability for the Regulator to prohibit, by gazette notice, the sale or use by a person of an item of electrical equipment, if the Regulator believes on reasonable grounds that the item does not comply with the safety criteria in AS/NZS 3820 (Essential safety requirements for electrical equipment). However, these prohibitions are not adapted to the specific issue and needs of ceasing sales. The ESO advocated for a more specific regulatory response that does not require a specific notice for a specific retailer and item. The Review is of the opinion that a more specialised notice that is directed to the type of equipment and applicable to all persons should be further considered.

(e) ***Removing from display***

Similar to the characterisation of the limitations of current regulations to require ceasing the sale of items, requirements to remove unsafe items from display suffer from shortcomings. Particularly, the mechanism of improvement notices (s 146) to compel retailers from removing unsafe items from display are directed at an individual piece of equipment, not to a type of equipment. Again, the ESO suggested a specific notice tailored to the needs of this context. One suggestion entailed a stop sale notice for a type of electrical equipment shown to not comply with the standard or that is otherwise electrically unsafe. However, unlike the current Unsafe Equipment Notice (UEN), which is issued to a PCBU, a new notice should be more flexible in operation. For example, the PCBU may not be the relevant person to whom the ESO wishes the notice to apply. It could, for example be a franchisee of the PCBU. Broad application is therefore needed.

(f) ***DIY warning signs***

Electrical Safety Regulation 2013 section 190 mandates displaying Do-It-Yourself (DIY) warning signs for particular forms of electrical equipment. The regulations require the sign to be (s 190(2)):

(a) in close proximity to the point of display of the item; or
(b) as part of the price tag of the item; or
(c) on a label attached to the packaging of the item; or
(d) as part of the packaging of the item; or
(e) on a label attached to the item.

The ESO raised with the Review the applicability of this requirement to online environments. Essentially, clarity is sought given that the requirements appear to be directed to the layout of a physical store (though one might interpret sub-section (a) to mean on the same webpage as the product for "proximity"). The Review recommends consideration be given to adapting the requirements to online environments for the assistance of retailers and for improved consumer safety. Further, sub-section (a) – requiring a warning sign *near* an item – should be additional to the requirement for a warning sign *on* the item (via any of (b)-(e)).

(g) ***Online sales***

Along the same lines as the concern with current DIY warning sign regulations, but much more broadly, the ESO has raised with the Review the need to be clear that the jurisdiction of the Act extends to electrical equipment sold on online platforms extending to Queensland consumers. As a starting point, the Review is of the opinion that there is nothing in the Act to suggest it is limited in this respect, and the true issue is communication with stakeholders as to the fact of online applicability. However, it is also true that there would be no harm in making this abundantly clear within the Act itself, such as via a note. This may assist with communication activities both in respect of local consumers, international seller and even platforms.

(h) ***Competent person – hiring equipment and second-hand equipment***

Section 194 sets out requirements applicable to a business hiring out electrical equipment. Prior to doing so, the business must ensure the equipment is either "inspected and tested by a competent person before each hiring" or that it has an irremovable safety switch (s 194(2)(a)), among other regulatory requirements. The ESO raised with the Review the clarity of the term "competent person". Schedule 9 of the Regulations defines "competent person" as follows:

> "in relation to a task, means a person who has acquired, through training, qualifications, experience or a combination of these, the knowledge and skill to carry out the task.
>
> *Note*—Electrical work may only be performed by a person if the person—
> (a) is the holder of an appropriate electrical licence authorising the work; or (b) is otherwise authorised to perform the work under the Act."

The term appears to be deliberately defined broadly to apply to many different contexts throughout the Regulations. Section 194 provides no gloss on the particular "knowledge and skills" relevant to testing equipment. Further, section 186 which requires testing (or information to the effect that no testing has occurred) on second-hand equipment for sale refers, instead of "competent person", to testing "by a licensed electrical worker who is qualify to test the item" (s 186(2)).

The Review is of the opinion that competence to test electrical equipment tolerably clear, but that there is an inconsistency in the Regulations between usage of the concept of a "competent person" and other terminology for the purpose of testing. This could be considered for harmonisation.

(i) *Certificates on equipment*

Section 154 allows a person to apply to the Regulator for a certificate of conformity for a type of level 3 in-scope electrical equipment. Section 155 provides that the Regulator may issue a certificate of conformity, if approving the application. The alternative is that the Regulator refuses to approve the application. These two options, however, are seen by the ESO as limiting the Regulator's administration of certificates of conformity. Specifically, the ESO requested a third option, being that the Regulator decides not to accept an application, leaving room for an external certifier to consider it. This preliminary step would allow the Regulatory to delegate the function of consideration (and approval or refusal) of the application. The Review agrees that this option should be open to the Regulator.

(j) *Test and tag – identification*

A key element of equipment safety is what is colloquially referred to as "test and tag" requirements. The Review has considered the adequacy of current arrangements, both in an administrative respect and substantive respects. Regarding administration, the Review sees an opportunity to enhance the ESO's ability to monitor compliance with the Act through the inclusion of some form of identifying information on the tag. The example of "name and phone number" is the wording ultimately included in the recommendation below. Naturally, this raises the issue of privacy and will need to be considered further and navigated, if possible, prior to the implementation of this recommendation.

Alternatives to name and phone number that serve the same purpose of identification by the ESO might also be considered.

(k) *Test and tag – removal or repair*

Following on from recommendation (j), concerning administrative improvements to test and tag requirements, the Review sees an opportunity for direct, substantive improvements to electrical safety through those conducting testing and tagging. While this recommendation is dependent on the qualifications and competence of the person in question, where that person finds equipment to be unsafe, the Review suggests the equipment could be removed from service immediately. Further, where a simple repair, such as to cords or plug tops, could be safely conducted by an individual who holds an appropriate electrical licence, the Review sees this as an opportunity to improve electrical safety.

Recommendation 76: Consider enhancing the regulation of unsafe electrical equipment, including by requiring removal from sale, appropriate notifications are made, and relevant documentation kept (Regulations Parts 8), particularly consideration to be given to
Requiring responsible suppliers to:
(a) keep documents required by equipment safety rules (Regulations s 147-8); and
(b) advise clients not to sell items found to be unsafe, subject to a penalty.

In respect of officers, the intent of this recommendation could be achieved by:
(c) requiring officers to ensure a recall is conducted on items found to be unsafe, including in the context of liquidation, consistent with corporations' law. (Act, Part 2, Div 2B).

In respect of retailers, the intent of this recommendation could be achieved by:
(d) requiring retailers to cease selling unsafe items, subject to a penalty for continuing to knowingly sell unsafe items
(e) empowering the Regulator to direct that unsafe electrical equipment be removed from display and sale (Act, s 146*ff.*)
(f) require warning signs both near *and* on products, and, through the development of communication material, assist retailers to display general DIY warning signs in relevant areas of stores or online environments, to help to ensure purchasers are competent to install the equipment.
(g) ensure the jurisdiction of the Act extends to electrical equipment sold on online platforms in Queensland (Act, Part 2)
(h) reviewing the use of the term "competent person" for consistency in Part 8 (Regulations ss 186, 194).

Further, to assist in regulating safe electrical equipment, consideration should be given to:
(i) clarifying that the Regulator is not obliged to issue certificates on equipment, allowing flexibility to engage private certifiers with Regulator monitoring and oversight (ss 122, 154-9)
(j) a requirement for test and tag contactors and competent persons to be required to include contact information such as name and phone number on test and tags attached

to electrical equipment enabling the Electrical Safety Office to identify contractors/businesses and carry out regulatory actions as needed
(k) implement a requirement for test and tag contractors and competent persons to remove from service any equipment that has been deemed to be unsafe through the test and tag process. Further, where the individual holds an appropriate electrical licence, repair like for like such as cords and plug tops.

E. Electricity Entities (Regulations, Part 9)

Amend the regulation of works of an electricity entity (Regulations, Part 9) to ensure the integrity of works considering contemporary development practices and technology.

(a) *Trafficable area*

Schedule 4 of the *Electrical Safety Regulation 2013* provides clearance of overhead electric lines. In this schedule low voltage and high voltage conductor clearances are prescribed. The schedule provides clearances for vertical clearance from roads, vertical clearance from other than roads, vertical clearance over non-trafficable land and horizontal clearance from road cuttings and embankments. Where the land is non-trafficable-characterised by the steepness or swampiness of its terrain and its inability to be crossed by traffic or mobile machinery the clearance requirements are lower than those prescribed for roads and areas other than roads.

During the Review it was noted that there had been a previous serious electrical incident where a fertiliser truck had contacted an 11KV conductor on a distribution line in an agricultural paddock. Following the incident, it was proposed that clarification should be made and a definition of "Trafficable" included in the Regulation to clarify that areas where agricultural activities are undertaken are "trafficable areas" and therefore should not be subjected to clearance requirements required for nontrafficable land. It is proposed that this change would ensure that it is clear that agricultural areas are not non trafficable land and therefore require to meet greater clearance requirements to reduce the risk of contacts and incidents.

(b) *Maintaining assets*

It was noted during the Review and in the recent ESO Supply and Networks paper that the current maintenance provisions in the *Electrical Safety Regulation 2013* for the maintenance of works are limited and do not cover all the risks posed by electrical infrastructure. It was noted that there should be an increased focus in these provisions on network asset risks. It was proposed during the Review that the current maintenance provisions (s215, s216) should be strengthened to cover all the risks of electrical infrastructure. To achieve this, it is recommended requiring an electricity entity to periodically inspect and maintain assets/network infrastructure.

Recommendation 77: Consider amending the regulation of works of an electricity entity (Regulation, Part 9) to ensure the integrity of works considering contemporary development of practices and technology, including by considering:

(a) expanding the meaning of trafficable area to include areas with agriculture (sections 207(1)(a) and 208(1)(a); Schedule 4).
(b) requiring an electricity entity to periodically inspect and maintain assets/network infrastructure (s 215).

F. Electricity Supply (Regulations, Part 10)

Recommendations in this section relate to the enhancement and clarification of regulation of electricity supply, including inspection and record keeping requirements, as well as the scope of private generating plant (Regulations, Part 10) to ensure it remains contemporary.

(a) *Certificates of inspection*

During the Review an issue raised from the recent ESO Supply and Networks paper whereby there were concerns about whether HV/HAZ accredited auditor's work. A recent review by the ESO of HV/HAZ accredited auditors was found not to provide confidence that HV/HAZ auditors have fulfilled their obligation under ES Reg 2013, s221(b). In response to this finding, it was proposed that a change to the current arrangement should be made to ensure confidence. It was proposed during the Review that the HV/HAZ accredited auditor should provide a certificate of inspection and confirmation to the PCBU confirming ES Reg 221 (b). It is noted this should also be provided to the Regulator. This approach is modelled off of SMS auditor requirements under ES Reg 234(4)(c). The most effective method of providing certificates was considered to be via an electronic portal. It is therefore recommended to require for high voltage or hazardous area electrical installations, accredited auditor inspection and testing to be evidenced by providing a certificate of inspection and confirmation (with prescribed content stipulated in the Regulation) to the Regulator via electronic portal (s 221(1)(b)).

(b) *Like for like changes*

Section 221 of the Regulations requires an accredited auditor to conduct an inspection following electrical installation work. It is not clear, at present, whether this requirement applies to 'like for like' changes of electrical equipment in the electrical installation. This ambiguity arises as section 19(1)(a) of the Act provides "electrical installation work" does *not* include "repairing or maintaining electrical equipment included in the electrical installation". Whether or not "like for like" replacement is a form of repairing or maintaining the installation is the central conundrum. The Review is of the opinion that "like for like" replacement is not a form of work that alters the nature of the electrical installation such that an inspection by an accredited auditor is warranted thereafter. The intent of section 221 appears to be directed to the mischief arising from alterations giving rise to electrical safety risks. Instances of "like for like" replacements do not appear to align with this purpose. The Review is therefore of the opinion that in cases of "like for like" replacement, inspections required under section 221 of the Regulations do not apply. This should be clarified in the wording of the Regulations. Unintended consequences were noted during consideration of this recommendation, of particular concern was the potential for broad interpretation of "like for like" that may result in

extending the circumstances this would be applicable beyond the original intent. Mitigation of this risk should be considered during implementation.

(c) *Private generating plant*

Concerns were raised during the Review about whether the term "private generating plant" encapsulates renewables and off-grid forms of generation. Section 6 of the Act defines "private plant" as: "equipment used for generating electricity, other than equipment used by an electricity entity under an authority or special approval under the Electricity Act." The Regulations refer to private generating plant at sections 224-6, placing obligations concerning isolation, compliance with the wiring rules, and safe and stable parallel operation with the works of an electricity entity on a person whose electrical installation contains "private generating plant".

In line with the intent of the Review as a whole and previous recommendations made, the Review is of the opinion that renewables and off-grid storage should fall within the meaning of private generating plant. However, this recommendation appears to be effectively covered by recommendations made in Chapter 6 on core definitions. In particular, the definition of "electrical equipment" and the associated definition of "electrical installation" are central to regulatory requirement for private generating plant. As a result, there may be no independent steps needed to ensure this recommendation is implemented.

(d) *Records of test*

Part 10 Division 3 of the Regulations prescribe testing requirements with regards to Electricity Supply. It was raised during the Review that requirements in sections 226-230 would benefit of clarification in areas to ensure the effectiveness of duties to keep records of test results and the working behind them in the context of licensed contractors testing electrical work.

One of the changes proposed to achieve this was specification in sections such as s226 (3) (a) that the tests are specified as, those required by the wiring rules. This would reduce the ambiguity and increase the effectiveness of duties. A further proposal to ensure the effectiveness of duties was to require test results to be submitted to the Regulation through the reporting portal as recommended at recommendation 44. This is proposed to both ensure testing is carried out as necessary providing a record of the testing, ensuring the appropriate details of the testing are recorded and ensures that records as required to be kept in this part are kept. It is therefore recommended ensuring the effectiveness of duties to keep records of test results and the working behind them in the context of licensed contractors testing electrical work for safety (ss 226-230).

(e) *Disconnection requirement*

During the Review the ESO raised that the current electrical safety legislation is limited in only prescribing arrangements for the reconnection of an electrical installation to an electricity source (s 220). Disconnection arrangements for the disconnection of an electrical installation to an electricity source are not included. This is a source of concern as omission of this in the legislation means there are no mandated processes to ensure

the safe disconnection of an installation. This raises particular concern in the instance of property disconnection, it is noted that the safety of the installation could be compromised unless appropriate disconnection processes take place. It is therefore recommended to consider adding disconnection requirements for the disconnection of an electrical installation to an electricity source.

Recommendation 78: Consider enhancing and clarifying the regulation of electricity supply, including inspection and record keeping requirements, as well as the scope of private generating plant (Regulations, Part 10) to ensure it remains contemporary, including by considering:

(a) implementing a requirement, for high voltage or hazardous area electrical installations, accredited auditor inspection and testing to be evidenced by providing a certificate of inspection and confirmation (with prescribed content stipulated in the Regulations) to the Regulator via electronic portal (Recommendation 45) (s 221(1)(b))
(b) clarifying that the requirement for accredited auditors to conduct an inspection following electrical installation work does not apply to 'like for like' changes of electrical equipment in the electrical installation
(c) ensuring renewables and off-grid storage are within the meaning of private generating plant, thereby requiring compliance with the Wiring Rules (s 224) and requirements for safe and stable parallel operation with the works of the electricity entity (s 225).
(d) ensuring the effectiveness of duties to keep records of test results and the working behind them in the context of licensed contractors testing electrical work for safety (ss 226-230). Test results to be submitted to the Regulator through the reporting portal (Recommendation 45).
(e) Consider adding disconnection requirements for disconnection of electrical installation to electricity source (s220)

G. Safety Management Systems (Regulations, Part 11)

Clarify and enhance the requirements for safety management systems (SMS) (Regulations, Part 11).

(a) *Audit plans*

Currently under s 234(4)(c) of the Regulations a prescribed electricity entity's safety management system must provide for submitting to the Regulator, after each annual audit, a certificate of the accredited auditor who conducts the auditing mentioned in paragraph (a), stating the current level of compliance of the prescribed electricity entity with its safety management system. At present the requirements do not extend to providing the Regulator with annual audit plans, audit reports, corrective action plans and risk management plans. Currently where an entity refuses to provide ancillary documentation such as an audit report, the Regulator must go through an administratively burdensome process and require the document under section 122C (Power of the Regulator to obtain information) of the Act. It is proposed that as an alternative to this s 234 of the *Electrical Safety Regulation 2013*, could be expanded to clarify the need to supply the Regulator with audit reports, corrective action plans and risk management plans in addition to the requirements to provide annual audit plans and

audit certificates. It is also proposed that the contents of this documentation should also be clarified in section 234 to ensure the requirements are clear and include the information as appropriate. It is therefore recommended to clarify the requirements both contents of and need to supply the Regulator with annual audit reports, corrective action plans and risk management plans (s 234).

(b) ***Risk management plans***

The requirements of a Safety Management System are outlined in section 66 of the Act and section 234 of the *Electrical Safety Regulation 2013*. It was noted during the Review and in the recent Supply and Networks Paper by the ESO that these provisions are broad and open to interpretation. It was raised during the Review that in addition to maintaining a SMS, prescribed electricity entities should provide risk management plans to the Regulator. It was proposed that risk management plans should, amongst other things; identify the primary risks of the prescribed electricity entities electricity network infrastructure be evidence based, measure, monitor and report planned and remedial actions. The proposed changes are expected to improve management of prescribed entity electrical safety risks. It is therefore recommended requiring electricity entities to provide risk management plans to the Regulator, in addition to maintaining a SMS (s 234 (3c), (4a)).

Recommendation 79: Consider clarifying and enhancing the requirements for safety management systems (SMS) (Regulations, Part 11), including by considering:

(a) clarifying the requirements regarding both the contents of and need to supply the Regulator with annual audit plans, audit reports, corrective action plans, and risk management plans (s 234); and
(b) requiring prescribed electricity entities to provide risk management plans to the Regulator, in addition to maintaining a SMS (s 234(3c), (4a)).

H. Accredited Auditors (Part 12)

This section seeks to make one recommendation to clarify a matter related to accredited auditors (Regulations, Part 12), namely the appointment of temporary accredited auditors.

Section 136A of the Act provides that the Regulator may ask for further information or documents from an accredited auditor. This provision provides a mechanism for the Regulator to monitor accredited auditors to ensure they continue to satisfy their conditions of office. Previously this has involved engaging external providers to conduct audits of auditors. It was proposed by the ESO, in the form of the Supply and Networks paper, that a potential improvement to the mechanics of this process could include provisions to allow the appointment of a temporary accredited auditor. This would allow for an external auditor to be appointed for the duration of work. It is proposed that the temporary auditor should have powers to fulfil the monitoring arrangement as required. It is therefore recommended that the Regulator be able to appoint temporary accredited auditors for the duration of work to audit accredited auditors (ss 235, 237; Act s136A).

Recommendation 80: Consider clarifying one matter related to accredited auditors (Regulations, Part 12) by allowing for the appointment of temporary accredited auditors, for the duration of a specified period to audit accredited auditors (ss 235, 237; Act s 136A).

I. Incidents and Reporting (Regulations, Part 14)

Part 14 of the Regulations contains various duties to notify the Regulator of incidents and take action in response to incidents, including preserving an incident or event site and storing of electrical equipment after a serious electrical incident.

The notification and reporting requirements require miscellaneous amendments to ensure they remain contemporary and to clarify certain requirements.

(a) *Notification by distribution entities*

Section 266 requires a distribution entity to give the Regulator written notice of a serious electrical incident or dangerous electrical event, but only when (a) advised of the incident, and (b) "the distribution entity is the distribution entity for the incident or event." The latter requirement is further explained by the definitions at section 264. For example, at section 264(1)(a) the definition of "the distribution entity for a serious electrical incident" is "if the electrical equipment the subject of the incident is part of the works of a distribution entity".

The ESO has suggested to the Review that the trigger for notification in this situation could be broadened. Specifically, the ESO suggests notification could be required independent of determining whether or not the electrical equipment, the subject of the incident is part of the works of the distribution entity that has been advised of the incident. More simply, if a distribution entity is advised of an incident, they should report it to the Regulator regardless of its causal link to that distribution entity's works. The benefit of this suggested change is clear – to enable the quickest possible notifications. The "cost" is the burden placed on the generating entity in the form of any extra reporting required.

The Review is of the opinion that distribution entities should report incidents they are advised of, to avoid situations where consumers may fail to advise the correct distribution entity (i.e., the distribution entity whose works contain the electrical equipment that is the subject of the incident, or that supplies electricity to the electrical equipment the subject of the incident).

(b) *Off-grid electric shock*

While duties under Part 14 are invoked in its different sections by reference to serious electrical incidents or dangerous electrical events occurring, section 267 is unique. It refers to neither concept, nor to "electrical equipment". The trigger for notification under section 267 is the distribution entity being advised by a consumer that a person has received an electric shock.

In the context of section 267, the ESO has raised with the Review the suggestion to clarify that it applies to off-grid contexts. This topic has been considered more broadly in Chapter 6, in relation to incident definitions (see [6.4]). However, given the absence of reference to incident definitions in section 267, the comment made at [6.4] of this Report do not appear to apply.

Notwithstanding, it remains clear that the concept that is engaged – electric shock – is in no way limited to a particular context. The precise nature of the source of the electricity causing the stock appears irrelevant, including whether it is sourced on-grid or off-grid. It therefore appears that the duty under s 267 applies to off-grid context. In line with the opinion expressed at [6.4], the Review is of the opinion that to raise awareness of this fact, off-grid applicability could be communicated either legislatively (via a "note" in s 267), or via non-legislative means of stakeholder communication, or both.

(c) *Annual reports*

Section 268 requires distribution entities to report to the Regulator every three months about the incident records made in that time. In line with this approach to bulk reporting, the ESO has recommended to the Review a similar but broader approach for electricity entities generally. Separate to the requirement of section 268, and indeed any current section in Part 14 of the Regulations, the Review is of the opinion that a duty on prescribed electricity entities to publish an annual report of incidents would bring attention not only to incidents, but to trends and potential preventive actions. The annual report would amount, at a minimum, to a collation of reports made to the Regulator, collected by prescribed electricity entities over the calendar year, and published within three months of the end of that year. The definition of "prescribed electricity entities" for the purpose of this new section is the "Prescribed electricity entities" listed in Schedule 6 of the Regulations (to be amended in line with Recommendation 20(a) of this report).

Recommendation 81: Consider amending the Serious Electrical Incident and Dangerous Electrical Event notification and reporting requirements to ensure they remain contemporary and to clarify miscellaneous requirements (Regulations, Part 14), including by considering:

(a) requiring distribution entities to notify the Regulator of Serious Electrical Incidents and Dangerous Electrical Events even if they are not the distribution entity whose works are the subject of the incident, or that supplies electricity to the electrical equipment that is the subject of the incident (Regulations ss 264, 266(1)(b)); and
(b) clarifying that off-grid contexts are within the reporting required by distribution entities for electric shock (Regulations s 267); and
(c) requiring prescribed electricity entities to publish reports of incidents occurring in each calendar year, within three months of the end of the relevant year (Part 14, Schedule 6).

J. Miscellaneous (Regulations, Part 15)

Amend miscellaneous provisions in the Regulations to ensure safety is maintained in various contexts (Regulations, Part 15).

(a) *Greenfield petroleum plant sites*

"Petroleum plant" is defined by reference to the *Petroleum and Gas (Production and Safety) Act 2004*. Section 6 of this Act states that certain excluded provisions (Parts 2, 3 and 4) do not apply to "petroleum plant". As such, if a site is not operating as a "petroleum plant" it is clear that the Act applies. Notwithstanding, the ESO raised with the Review the need to clarify the application of the Act to greenfield petroleum plant sites not operating as petroleum plants. The Review is of the opinion that this is a matter for the communication by the ESO with relevant stakeholders. However, that communication may be assisted by a note in the Regulations at section 276.

(b) *Transmission entities*

During the Review, Powerlink raised recommendations with regards to section 269 of the Regulations, concerning a duty to preserve an incident or event site. However, under sub-section 269(4), this duty does not prevent action for a number of prescribed reasons. Among these reasons is a person acting under the authority of the distribution entity for the incident or event. Powerlink noted that similar authority is not provided to transmission entities despite the potential for need for action in the interest of electrical safety. The Review is of the opinion that a hypothetical situation involving a transmission entity may arise and is therefore agreeable to the proposal to include transmission entities in sub-section 269(4)(e). Likewise, Powerlink noted that in an emergency section 280 allows distribution entities to isolate powerlines. Powerlink sought the inclusion of transmission entities. Again, and for the same reasons, the Review is agreeable. Overall, it is recommended that consideration is given to expanding the ability of transmission entities acting in make safe circumstances similar to the abilities of distribution entities.

(c) *Electrical isolation certificates*

In 2013, Mr Matthew Trent Ross sustained a fatal electrical shock working to install guttering and fascia at a construction site. The coroner found the source of the electrical current was a light fitting timed to activate at dusk which came into contact with the scaffolding Matthew was holding.

Deputy State Coroner John Lock delivered his findings of the inquest on 13 April 2018. Recommendation 2 made by Deputy State Coroner John Lock recommended that:

Recommendation 2

OIR and ESO review the circumstances of this case and consider whether there should be amendments to the Demolition Work: Code of Practice 2013 and/or the Managing Electrical risks in the workplace Code of Practice 2013 to mandate an electrical isolation certificate (EIC) be obtained for any demolition or dismantling work in any building structure; that an ESO should provide sufficient information to identify the precise area that has been isolated, including any cabling and fittings which have been removed, and if there is any remaining cabling and fittings of the relevant area, as well as details of the method of isolation, including use of lockout and tag-out means and testing to prove de-

energized protocols; that a further EIC be mandatory where there is any extension of the scope of demolition and dismantling work.

The coronial recommendation proposes the implementation of electrical isolation certificates, it is recommended that these would be compulsory when undertaking demolition or dismantling work in any building structure. This would provide key information such as identifying the precise area that has been isolated including the removal of cabling and fittings, in addition to method of isolation and testing to evidence de-energisation protocols. This would ensure that electrical isolation has been adequately considered and executed before the undertaking of such work. In the inquest following the fatality of Matthew Trent Ross, it was found that the original scope of work was changed, and completion of a further electrical isolation certificate was not completed as it was viewed as part of the existing job. This however was an increase in scope and the area isolated did not consider the additional work. In response to this it is proposed that a further EIC be mandatory where there is any extension of the scope of demolition work. This ensures that any change to original plans, including extension of scope is considered and where further isolation is needed, it is planned for, carried out, checked and reported to the Regulator. This affords workers the necessary protections when working on demolition/ dismantling work. The Review considers the implementation of mandatory electrical isolation certificates as described by the coronial recommendation, in addition to the requirement of a further certificate where there is an extension to the scope of demolition and dismantling work to be a sensible and proportionate approach. It is proposed that these certificates should be provided to the Regulator to ensure compliance with the requirement and afford the appropriate level of Regulator oversight.

While the recommendation pertains to Codes of Practice, the Review considered the issue in relation to risks posed through demolition works in the context of the Legislation. Codes of practice under the *Electrical Safety Act 2002* are not mandatory to follow, instead they provide practical advice on how to meet electrical safety responsibilities laid out in the legislation. This poses implementation challenges to mandate electrical isolation certificates through inclusion in the *Managing Electrical Risks in the Workplace Code of Practice*. The other implementation challenge in enacting this change through the codes of practice, is the status of these codes as national model codes of practice. These codes of practice are written by Safe Work Australia and are then adopted by harmonised jurisdictions including Queensland following minor changes to reflect minor jurisdictional variation. Noting these challenges, the Review considered legislative change as a mechanism for instating this requirement. This would achieve the intent of the recommendation to mandate the requirement, however, would not limit consequential amendments to the codes of practice in the future. The Review also considered that in implementing this recommendation consideration should be given to requiring workers and contractors to have access to the isolation certificates and for the isolated areas to be clearly communicated to workers to ensure that the intent behind the certificate is achieved in full.

(d) *Further electrical isolation certificates*

Following on from recommendation (c), directly above, and the rationale expressed therein, the Review is also of the opinion that where extension to the scope of demolition and dismantling work occurs, a further *electrical isolation certificate* should be required.

(e) ***Climbing poles of electricity entity prohibited***

During the Review officers from the ESO raised an issue that has come about due to the advancements and changes to the operation of industry over the life of the legislation. Section 278 of the Regulations provide:

> "A person must not climb a pole, standard or other structure that is part of the works of an electricity entity, or a ladder attached to a pole, standard or other structure that is part of the works of an electricity entity, if the electricity entity has not authorised the person to climb the pole, standard, other structure or ladder.
> (2) Subsection (1) does not apply to—
> (a) an inspector; or
> (b) a licensed electrical contractor or licensed electrical worker who, under part 10, division 1, de-energises and re-energises a consumer's electrical installation by—
> (i) removing and replacing a fuse wedge from a service fuse; or
> (ii) switching off and on a circuit breaker installed as a service line disconnector."

At the commencement of this provision, it was not foreseen that non-entity workers would be working on poles, presently this practice has changed where often others work on entity poles, this may include telecommunication workers and council workers. A further change that has occurred in terms of industry practice is the use of plant such as cherry pickers as an alternative to ladders to access parts of the pole. It is proposed that this section is updated to ensure the existing framework applies to working on poles including where access to the pole is gained not through the use of a ladder but through plant such as a cherry picker, reflecting contemporary industry practice. It was proposed by the ESO that this may be achieved by including "work on a pole" following each instance of "climb a pole" throughout the provision.

With consideration to the change in work practices since the commencement of s278 of the *Electrical Safety Regulation 2013* it is recommended to consider expanding electricity entity authorisation requirements for climbing poles, standard or other structure that is part of the works of an electrical entity to include working on poles, standard or other structures that are part of the works of an electricity entity. (s278 ES Reg).

Recommendation 82: Consider amending miscellaneous provisions in the Regulations to ensure safety is maintained in various contexts (Regulations, Part 15), including:

(a) clarifying that the Act applies to greenfield petroleum plant sites not operating as petroleum plants (Regulations s 276; Act, s 6)
(b) expanding the ability of transmission entities to act in make safe circumstances, similar to the abilities of distribution entities (s 280 and ss 269, 271)
(c) requiring principal contractors to engage an electrical contractor to investigate and, where appropriate, issue and upload to the Electrical Safety Office portal *electrical isolation certificates* (Recommendation 45) for demolition and dismantling work providing sufficient information to identify:
(i) the precise area isolated; and

(ii) the method of isolation, including use of lockout and tag-out means and testing to prove de-energisation, and
(iii) any cabling or fittings removed and remaining.
(d) requiring further *electrical isolation certificates* where there is an extension of the scope of demolition and dismantling work including uploading to the Electrical Safety Office portal (Recommendation 45).
(e) Consider expanding electricity entity authorisation requirements for climbing poles, standard or other structure that is part of the works of an electrical entity to include working on poles, standard or other structures that are part of the works of an electricity entity (s 278).

K. Administrative Matters

Finally, it is necessary to correct administrative matters in the Act and Regulation that have been identified during the Review. These largely involve simple errors, such as referring to the wrong sub-section. An exception is the need to add the *Labour Hire Licensing Act 2017* to the list of Acts enabling the ESO to share information. These minor recommendations are otherwise self-explanatory.

Recommendation 83: Consider correcting administrative matters in the Act and Regulation that have been identified in the course of the review, including:

In the Act:
(a) removing the incorrect reference in Act s 32(3) to sub-section (1)(b) and replacing it with a reference to sub-section (2)(b)
(b) removing outdated reference to the department's website as "www.justice.qld.gov.au" at s 48K (7)
(c) including the *Labour Hire Licensing Act 2017* to list of Acts enabling the Electrical Safety Office to share information with the Labour Hire Licensing Compliance Unit
(d) removing transitional provisions no longer considered necessary or effective, based on consultation with the Office of the Queensland Parliamentary Counsel (Parts 15-22).

In the Regulations:
(e) changing reference from "one month" to a specific number of days, namely "28 day" in ss 49-50
(f) removing incorrect reference to Schedule 9, paragraph (c) in at s 279
(g) removing transitional provisions no longer considered necessary or effective, based on consultation with the Office of the Queensland Parliamentary Counsel (Part 16).

Chapter 11: Conclusion and next steps

This report has been informed by significant consultation with diverse stakeholders (Chapter 4), made possible with the support and resources provided by OIR (Chapter 3). Given that this is the first comprehensive review of the Act since it commenced (Chapter 2), combined with the broad scope of the Act, countless reform proposals have been advocated, from incorporating emerging renewable technologies within the scope of the Act, to detailed, minor changes to specifics of regulations. The diversity and detail of the issues raised, along with the technical nature of many, means the task of conducting the Review has been considerable (Chapter 5). The result is many recommendations, some of which are significant in terms of implementation complexity and timeframes, and which will therefore give rise to further impact assessments and legislative processes.

The core of the Review has involved addressing technological change to ensure the ongoing relevance of key definitions, the purpose and powers under the Act (Chapter 6). This has led to recommendations to expand the definition of "electrical equipment", which engages regulatory requirements that will ensure electrical safety into the future.

Ancillary consideration involved the complex relationships and the ongoing relevance of electrical safety duties, with a particular focus ensuring sufficient duties throughout the supply chain for electrical equipment and, separately, on the role and responsibilities of Qualified Technical Persons (Chapter 7).

Further, the Review has considered the ongoing challenge of alignment with work health and safety legislation, making a limited number of recommendations considered useful for adoption (Chapter 8).

The final and broad aim of enhancing safety has been considered in Chapters 9 and 10. Covering a wide range subject matter, beginning with competence requirements through licensing reforms, to compliance, to specific regulatory changes, the Review has attempted to provide suggestions for specific reforms that have arisen from 20 years of experience by entities, industry, unions and the Regulator.

Naturally, some issues have engendered disagreement between stakeholders. Wherever this occurred, this report has attempted to state the positions put forward and provide reasons for the inevitable conclusion one way or the other. To a very large extent, however, I believe the Review has been able to provide stakeholders with recommendations reflecting their desired updates to Queensland's electrical safety regime.

List of Recommendations

#	*Electrical Safety Act 2002* Review – Recommendations
	Technological change and ensuring the ongoing relevance of key definitions, purpose and powers under the Act (Chapter 6)
1	It is recommended that modernising the scope of the Act to ensure new and emerging energy generation and storage technologies are incorporated, whether or not they are connected to the grid or stand-alone in nature, by including in the definition of electrical equipment/electrical installation: (a) solar PV modules, designed to be connected to other solar PV modules and when connected be of a combined voltage of greater than extra low voltage; and (b) battery cells, when connected to other cells for the purpose of storing and releasing power of a combined voltage of greater than extra low voltage.
2	Review the electrical safety risks presented in electric vehicles and consider their inclusion in the scope of regulation by the Act. It is further recommended that the Electrical Safety Office engage with other relevant Queensland and Australian regulators as needed to ensure appropriate scope and to avoid both regulatory gaps and duplication.
3	Review the electrical safety risks presented in hydrogen-based electricity generation and storage technologies, including hydrogen-powered vehicles, and consider their inclusion in the scope of the Regulation by the Act. It is further recommended that the Electrical Safety Office engage with other relevant Queensland and Australian regulators as needed to ensure appropriate scope and to avoid both regulatory gaps and duplication.
4	To ensure the Act keeps pace with technological change, consider creating a general category of exception to the "extra low voltage" threshold for the definition of "electrical equipment", to reflect risk to life and property by ELV electrical equipment.
5	For solar PV panels falling within the definition of electrical equipment (see Recommendation 1), consider ensuring that the resultant "electrical work" definition is amended as needed to require: (a) all connections and testing of PV module cabling as well as earthing and bonding work be performed by competent licensed electrical worker/s; and (b) installation of cabling to be carried out by a licensed electrical worker or an unlicensed person assisting a licensed electrical worker and working under their direct supervision; and (c) the mounting, fixing, and locating of solar PV modules and arrays to be carried out by competent persons under the direct supervision (Recommendation 16) of a licensed electrical worker (Act s 18(2)(f)).
6	Consider including within the definition for Electrical Work that the electrical aspects of air conditioning / mechanical services work is electrical work and the tasks of fixing, installation of brackets/mounting of equipment and mechanical cable protection is ancillary to the complete installation.
7	Ensure the installation of mechanical protection for cables, including but not limited to conduit (both plastic and metal), cable racks and trays, skirting, troughs etc., and the installation of cabling into these protection components is the work of licensed electrical workers or to be performed under the direct supervision of a licensed electrical worker. Associated with this work is earthing and bonding work, to be defined as electrical work (recommendation 5) and must only be performed by competent licensed electrical worker/s.
8	For electric vehicles (or parts thereof) falling within the definition of "electrical equipment" (see Recommendations 2 and 4), consider requiring: (a) appropriately licensed electrical workers to carry out the electrical work on the electrical components when the vehicle is serviced and or repaired, to ensure the safety of owners/operators and community; and (b) appropriately licensed electrical workers carry out the electrical work on the electrical components of the vehicle when an electric vehicle requires on-road break-down work to ensure safety of owners/operators, the community and first responders.
9	It is recommended that the electrical aspects of fire protection work are recognised as "electrical work", notwithstanding equipment being "extra low voltage", either via the implementation of Recommendation 3 or a specific amendment to the definition of "electrical work".
10	Ensure all hardwired smoke alarms are to be labelled on the cover to identify that it is electrical equipment and should only be maintained by a licensed electrical worker, and. (a) it is recommended that the Electrical Safety Office undertake a community awareness campaign to make the general public aware and promote electrical safety throughout Queensland.
11	Ensure the purpose of the Act is broad enough to establish an electrical safety framework able to remain responsive to the risks of new technologies as they arise, considering the inclusion of the purposes of "community safety" and "consumer protection".
12	Evaluate existing powers to make subordinate legislation and amend the Act as required to enable regulations to be made with respect to new technologies and methodologies that pose an electrical safety risk, as those technologies arise (Act s 210).
13	Clarify that off-grid systems are captured within the meaning "electrical equipment" and are therefore within the definitions of Serious Electrical Incident and Dangerous Electrical Event (Act, ss 11-12), giving rise to duties to notify the Regulator and otherwise respond to such incidents (Regulations, Part 14). (a) Consider creating an awareness campaign to ensure stakeholders understand the off-grid applicability of incident and event-related notification requirements.

14	Clarify the definitions of “serious electrical incident” and “dangerous electrical event” by adding examples for different levels of voltage, including ELV (considering Recommendation 4), and clarifying terminology used in those definitions such as: (a) considering replacing the term “doctor” with standard national law terminology – “medical practitioner” (s 11(b)-(c)) (b) specifying what it means to be “treated” by a doctor/medical practitioner, including what is not deemed “treatment”, as well as what is meant by “supervision” (s 11(b)-(c)) (c) specifying a threshold for “significant property damage” (s 12(c)).
15	Provide greater clarity by stipulating that testing electrical equipment is deemed a form of live work (Regulations, Division 1) to address the lack of understanding and awareness
16	It is recommended that the three levels of supervision be defined in the legislation by explicitly including the three recognised levels of supervision – direct, general and broad, as follows: Direct means constant in person monitoring by the licensed electrical worker, who remains within sight and/or earshot of the work being carried out by a person directly assisting the licensed electrical worker in conducting electrical work. General means for a person directly assisting the licensed electrical worker in conducting electrical, the licensed electrical worker is available in the same work location for in person assistance or instruction as needed. Broad means occasional in person contact at intervals during the day determined by the licensed electrical worker, for a person assisting the licensed electrical worker.
17	Consider clarifying miscellaneous requirements related to supervision, by: (a) inserting the word “direct” before “supervision” in section 18(2)(e)(iii); and (b) deleting the exception to holding a current electrical license for teachers supervising the electrical work of students (s 55(3)(g)), thereby requiring teachers to hold a current electrical license; and (c) requiring direct supervision for a person directly assisting the licensed electrical worker in the laying, cutting or sealing underground cables that are part of the works of an electricity entity before the initial connection of the cables to an electricity source (s 18(2)(j)).
18	Consider implementing expanded requirements for Safety Observers to encompass situations in which: (a) work includes testing, as a form of live work, by amending the current exemption in the Regulations, section 22(4)(a); and/or (b) work is undertaken near exposed live lines, in addition to the current requirements for a risk assessment informing other control measures, required in the Regulations, s68(2).
19	Consider amending the definition of safety observer to require a safety observer maintains currency of competence in rescue and resuscitation and the non-accredited course – “provide support to an electrical tradesperson” (RIISAM214A) or equivalent as determined by the Regulator (Schedule 9). (a) that training should be undertaken prior to acting as a safety observer and refreshed every 12 months.
20	Consider clarifying the meaning of miscellaneous terms found in core definitions of the Act and Regulations, to ensure stakeholder understanding and appropriate scope. Specifically, within the Act, it is considered that further clarification is required in relation to: (a) the definition of a “prescribed entity” generally via characteristics, other than listed entities (Regulations, ss 6, 233) (b) the meaning of “an area in which the atmosphere presents a risk to health and safety from fire or explosion”, to assist with straightforward application to real world situations (s 14(1)(c)) (c) the relationship between AS3000 and AS3008 and the definition of “electrical work” (s 18) (d) the meaning of “performance of work” in contrast to “performance of electrical work” (s 56(3)(b)).
	Complex relationships and the ongoing relevance of electrical safety duties (Chapter 7)
21	Consider implementing enhanced regulation of the supply chain for in-scope electrical equipment by adopting additional duties found in “non-conforming building products” (NCBP) legislation, administered by the Queensland Building and Construction Commission, including consideration of: (a) ensuring the product/equipment is safe as per the safety standard; and (b) ensuring each level of the supply chain only passes on products with the required information for the product/equipment; and (c) reporting requirements for licensed electrical workers when they encounter work employing non-conforming electrical products; and (d) ensuring requirements to comply with recall orders extend throughout the supply chain and including in multiple jurisdictions. In addition, consideration of expanded duties in relation to non-conforming electrical equipment to: (e) empower the Regulator to require, on demand, the supplier of relevant equipment to provide that equipment for testing at no cost to the Regulator (s 184); and (f) enabling the Regulator to impose a condition on a certificate of conformity (s 155(a)); and (g) establishing prohibitive penalties for non-conforming electrical equipment; and (h) clarifying the relationship between NCBP legislation scope and electrical safety requirements and legislation.
22	Consider strengthening requirements for importers and suppliers of electrical equipment to confirm they conform with the appropriate standard or Regulations, whichever is greater, and are electrically safe prior to sale. (i) noting that the applicable standard or Regulations is that at the time of import or manufacture in Australia.

23	Consider enhancing the Regulator's powers to cancel responsible supplier registrations; for example, where the person is ineligible, overseas or interstate (Regulations ss 139-142).
24	Consider including explicit duties of Qualified Technical Persons (QTP) in electrical safety legislation, as set out in current ESO guidance on the role of a QTP (as published on the WorkSafe website The role of the qualified technical person (QTP) | WorkSafe.qld.gov.au), requiring QTPs to: (a) develop and implement a safe system of work, and review and update procedures; and (b) ensure currency of worker competence and that scope of work is within a worker's current license scope and competence level; and (c) ensure appropriate levels of supervision for all workers, including apprentices and trainees (recommendation 13); and (d) annually arranging training and skills programs for workers, and regularly consult with workers on training needs; and (e) advise the PCBU and workers on compliance matters, including Australian Standards, legislation, and codes of practice.
25	Consider introducing a requirement that all businesses that employ (non-contract) electrical workers also must directly employ a QTP.
26	Consider introducing administrative means to ensure QTPs working across several organisations can fulfill the duties of the position effectively.
27	Clarify the meaning of "importer" for the purpose of ensuring the appropriate scope of duties to ensure products imported are electrically safe (s 8)
	Ongoing challenge of alignment with work health and safety legislation (Chapter 8)
28	Align the status of codes of practice made under the ES Act with the status of codes of practice made under the Work Health and Safety Act 2011 (s 26A), requiring compliance with the code of practice or a standard equivalent to or higher than the standard required under the code of practice.
29	Consider including within the Act, provisions equivalent to Health and Safety Representatives (HSR) and Work Health and Safety Officers (WHSO) found in the *Work Health and Safety Act 2011*
30	Consider implementing a requirement for consultation between duty holders, analogous to requirements under the Work Health and Safety Act 2011 (s 46). That is, if more than one person has a duty in relation to the same matter under the Act, each person with the duty must, so far as is reasonably practicable, consult, cooperate and coordinate activities with all other persons who have a duty in relation to the same matter.
	Enhancing Queensland's electrical safety framework (Chapter 9)
31	Explore assessment requirements for licences, including a requirement for satisfactory completion of one theory and two practical tests as part of an enhanced licence eligibility pathway for the electrical worker and electrical contractor licences.
32	Explore reforming occupational electrical licence eligibility with assessments to ensure licensees hold the technical and theoretical competency required to be eligible to apply for an electrical licence. Replicating the Victorian Electrical Licencing Assessment (ELA) approach. (a) it is considered this licensing assessment may be developed by the Commissioner for Electrical Safety and Electrical Licensing Committee in conjunction with the Electrical Safety Office.
33	Enhance the role of assessment administration by creating an assessment section within the Electrical Safety Office that oversees, administers and audits a number of Registered Training Organisations authorized to conduct assessments
34	Consider the introduction of CPD requirements for all licence holders, phasing in a requirement at initially low points attainment threshold (recommended at 6 hours/year equivalent or similar), to be increased over a suitable period of time until full implementation is achieved over no more than two contractor licence periods (six years). (a) It is considered that a full CPD program would not exceed a total of 20 hours CPD per year, or 60 hours each three-year licensing period upon full implementation. It is further recommended that for electrical contractors, professional development activities may include four areas of competence being technical, safety, business and leadership to ensure maintenance of competency across the scope of the licence; and (b) for licensed electrical workers who hold a supervisory or management role, a maximum of 15 hours CPD per year across technical, safety and leadership; and (c) and for electrical worker license holders, a maximum of 12 hours CPD per year across technical and safety in accordance with the maintenance of competency across the scope of the licence.
35	Consider reforming licence renewals to include testing to ensure licensee competency has been maintained through the licensed period, including by considering the following amendments: (a) empowering the Commissioner to conduct an initial review of licensing renewal assessments, supported by the Electrical Licensing Committee (ELC); and (b) informed by review outcomes, the Commissioner and ELC to develop and recommend a skilling/training program inclusive of an overview of legislative requirements, relevant changes in legislation, codes of practice and standards, requirements when working with apprentices and trainees and young people and other testing requirements as appropriate; and (c) empower the Electrical Safety Office to develop a licence renewal assessment informed by these outcomes.

36	Consider introducing licence renewal assessment every five years for electrical workers and every three years for electrical contractors.
37	To assist apprentices to transition to work, consider deeming an apprentice who successfully completes all apprenticeship and licence testing requirements and who lodges a licence application competent to hold an interim electrical worker licence for up to 3 months while the application is considered.
38	Consider providing all licensed electrical workers with an electronic copy of relevant Australian Standards as part of licencing fees (related to Recommendation 62).
39	Consider introducing a requirement where a licenced electrical worker is undertaking work in Queensland with an external licence from another jurisdiction and their primary place of residence is in Queensland, that the person applies for a Queensland licence after a period of time that could be considered and informed by the Electrical Licensing Committee.
40	Ensure photographic electrical licences, based on the current Workplace Health and Safety Queensland licensing approach, are incorporated within the ESO's electronic licensing database, to prevent and deter fraudulent use of licences by unlicensed or suspended licence holders.
41	It is recommended that a fit and proper person test for Electrical Contractors inclusive of the Qualified Technical Person and Qualified Business person roles be introduced by establishing no unsuitable previous record of dishonest business activity, dangerous or serious safety breaches and criminal convictions exist. Thus, enabling a regulatory lever to prevent unethical business practices such as phoenixing, declaring bankruptcy to avoid disciplinary measures, etc.
42	Consider removing existing accredited training requirement of QBPs on an electrical contractor's licence and replace with a requirement to complete all the business components of the Cert IV in Electrotechnology – Electrical Contracting (UEE42120) or equivalent. (a) Consider removing provisions for QBP in the Regulations s 7(d)(iii) to accept business experience as equivalent to formal qualifications and experience as experience is not a precursor to competence.
43	Consider implementing a requirement for QBPs or the PCBU to accept the reasonable advice, suggestions and solutions provided by a QTP with respect to electrical safety. Further, consider implementing a penalty infringement should the QBP or PCBU fail to act on the reasonably practicable electrical safety advice provided by a QTP.
44	Consider clarifying reporting requirements when electrical workers or contractors encounter non-conforming products or other unsafe equipment or installations.
45	Explore the development and implementation of an electronic reporting portal to enable electrical contractors and their workers to submit reports for inspection and testing results, including evidence of tests to be administered by the Electrical Safety Office. (a) it is further recommended the reports should include a list of the in-scope electrical equipment/devices installed to assist the Electrical Safety Office to regulate compliance with legislation and wiring rules as well as to assist in the event of a product recall.
46	Consider improving rural compliance with electrical safety standards, by removing the exemption for holding an electrical work licence for "remote rural installation work" (55(3)(c)) over a suitable transitional period related to recommendation 47.
47	Consider implementing a rural electrical installation auditing program over an appropriate transitional period (related to recommendation 46) to initially audit for electrical safety to address immediate or imminent risk, and to ensure the immediate removal of the electrical risks posed by those electrical installations. (a) It is further considered that those electrical installations that are non-compliant should be brought up to the required standard over a suitable period of time in consultation and agreement with the Electrical Safety Office via plans submitted and approved by the Regulator.
48	Ensure the electrical safety of installations in recreational vehicles by requiring an electrical installation audit at point of sale and every 10 years (in line with gas tank testing), and: (a) consider extending this provision to domestic, commercial and recreational vessels that utilise solar panels and or generators as their primary source of electricity (b) ensure regulatory oversight and proactive inspections are undertaken by the Regulator.
49	Consider enhancing the Regulator's powers to obtain and provide information regarding electrical safety (Act s 122C), to better fulfill the Regulator's function to "provide advice and information on electrical safety to duty holders under this Act and to the community" (Act s 122(1)(c)).
50	Consider expanding the Commissioner's responsibilities to include the development and approval, in conjunction with the Electrical Licensing Committee, of an enhanced auditing scheme, licensing assessments, licensing renewal assessments and Continuing Professional Development (Act, s 71) to be administered by the Electrical Safety Office.
51	Consider enhancing the powers of the Commissioner for Electrical Safety to enable requesting the production of documents or to attend an interview, by extending existing powers in relation to electrical licensing committee matters (s 72 and s 88).
52	Consider aligning the Commissioner for Electrical Safety's powers to those set out in the Resources Safety and Health Queensland Act 2020 (s 58 and s 59).
53	Consider the Commissioner's oversight and enhancing the Commissioner's ability to fulfill responsibilities of the position through membership and chairing of all electrical safety committees (s 71; Part 8, Divisions 2A and 2B).
54	Consider enhancing the Electrical Licensing Committee (ELC) functions to include appropriate oversight of electrical contractor licence holders inclusive of Qualified Business Persons (QBP) and Qualified Technical Persons (QTP) by: (a) providing the ability to have an electrical contractor licence holder referred to the ELC whenever an electrical worker employed by the electrical contractor is referred under s 106; and

	(b) providing the ability of the ELC to have the QBP and/or QTP on an electrical contractor licence referred to the ELC where an electrical worker employed by an electrical contractor is referred under s 106; and (c) providing the ability to have the QBP and/or QTP for a Person Conducting a Business or Undertaking (PCBU) to be able to be referred to the ELC where an electrical worker employed by the PCBU is referred to the ELC under a s 106.
55	Implement the inclusion of an additional member category of "training and education representatives" for the Electrical Licensing Committee to ensure the committee has adequate capacity in undertaking its recommended expanded responsibilities, including but not limited to review and development of a revised licensing renewal assessment (see Recommendation 35).
56	Remove the energy efficiency function of the Electrical Safety Board (Act, s 76(3)) and Electrical Equipment Committee (Act, s 94(2)), which is a holdover from pre-2002 functions exercised by the Electrical Safety Office that do not concern electrical safety.
57	In addition to recklessness, and in addition to any changes made as a result of the Government's implementation of the Boland review, consider creating a new offence of negligence to be implemented as a category 1 offence.
58	Consider introducing disciplinary provisions for electrical work licences no longer in force, as exists for electrical contractor licence holders (Act s 111), to ensure accountability of acts done while the licence was in force.
59	It is recommended to implement electrical licence inspectors. The function of the electrical licence inspector is to inspect electrical licences for the function of assessing compliance with electrical licensing requirements. An electrical licence inspector may not carry out inspections of electrical installation work or issues any orders. However, if the electrical licence inspector identified a possible breach of electrical safety regulations, they must report the matter to the Electrical Safety Office. An electrical licence inspector must be an employee of the Electrical Trades Union in Queensland and hold a current electrical worker's licence.
60	Consider implementing similar provisions from the Queensland Coal Mining Safety and Health Act 1999 (s 109 & s 118) for industry safety and health representatives. The union after a ballot of its members may appoint up to three industry safety and health representatives for a term of up to four years. The role is conducted on a full-time basis and ensures an acceptable level of electrical safety, reviews electrical safety procedures, takes action to 'make safe' in the event of an electrically unsafe installation and assists in the onsite investigation of unsafe practices.
61	Consider conducting a review of the financial contributions that support electrical safety in Queensland with a view to require proportionately determined financial contributions from all relevant Government Owned Corporations and industry sectors including electrical contracting and renewable generators, in addition to existing "electrical safety contributions" for distribution entities (Act, Part 14A, Division 1). This recommendation is to ensure these financial contributions keep pace with the rapidly expanding volume of electricity market participants.
62	Consider undertaking a review of licensing fees to ensure that the costs of compliance are taken into account in determining licence costs, in line with the fees and charges principles in consultation with Queensland Treasury.
63	Consider clarifying and enhancing miscellaneous requirements and definitions related to licensing and training, including Under the Act, consider the following recommended amendments: (a) replacing the definition of "relative" of a person, with the following list found in Queensland's industrial relations framework: (i) spouse; former spouse, de-facto spouse, former de-facto spouse; or (ii) child, ex-nuptial child, step-child, adopted child, ex-foster child; or (iii) parent, grandparent, grandchild, sister or brother of the person or spouse of the person; and (b) requiring a person conducting a business or undertaking to keep, in its register of licensed workers, the following details for workers presenting interstate licences: (i) licence jurisdiction, ii) any conditions on the licence, and iii) the expiry date of licence. Under the Regulations, consider the following recommended amendments; and (c) clarifying the meaning of "recognised industry practice" for CPR training required in relation to electrical work (s 28); and (d) requiring licensed electrical contractors to inform the Electrical Safety Office of a QBP or QTP ceasing to work with the contractor: (i) within 72 hours for the QBP or QTP on that contractor's licence, and (ii) within 7 days for additional QTPs (ss 49-50); and (e) reviewing and instating contemporary levels of insurance cover for electrical contractor licences (s 51); and (f) removing the refundable component of fees for refused or withdrawn applications (ss 63, 236, 256 and Schedule 8).
64	Consider enhancing compliance with electrical safety laws by expanding the regulatory means to discover, prevent and sanction breaches, and to otherwise clarify compliance requirements, by: (a) making explicit that inspectors have the power to access residential premises for the purposes of examining and assess switchboards (Act, s 140); and (b) introducing more effective, flexible, responsive sanctioning options, including by: (i) enabling inspectors to issue on the spot fines consistent with State Penalties Enforcement legislation: 1. if licence conditions are not followed (Act ss 57-57AA), such as Persons Conducting a Business or Undertaking (PCBU) using unlicensed workers; and 2. for noncompliance with an unsafe equipment notice (UEN) (Act s 148), should UENs be retained in the Act (cf. Recommendation 64(b)(viii)).

	(ii) considering introducing a sliding scale of fine amounts, to rectify the current lack of proportionality in penalty categories. (iii) allowing for suspensions or conditions to be placed on licences in the case of unpaid fines (iv) allowing an avenue for the regulator to recover unpaid debt via Court order, including order as to costs (v) clarifying that licensed electrical workers can be penalised for "knowingly" connecting defective electrical equipment (Regulations Pt 3, s 27). (vi) introducing penalty provisions for the improper use of a licence card, replicating the substance of section 51 of the Queensland Building and Construction Commission Act 1991. (vii) enhancing compliance and clarity with electrical safety laws through the repeal of Division 3 Unsafe equipment notices (Act, s 148 Unsafe Equipment Notice), given the greater effectiveness of issuing Electrical Safety Protection Notices (ESPNs) under section 147; and (c) clarifying and enhancing the ability of the Electrical Licensing Committee (ELC) to take disciplinary actions, including by: (i) clarifying that the ELC can defer licence suspensions (Act, ss 109(1)(b)) (ii) enabling the ELC to enter into an electrical safety undertaking that promotes electrical safety awareness and engagement, including but not limited to Safety Leadership at Work (SLAW) (Act, s 109) (iii) increasing penalties in disciplinary matters for licence holders (Act ss 109(1)(e)) (iv) enabling the ELC to require attendance of an electricity entity in disciplinary hearings concerning an employee of that electricity entity, if deemed necessary (Act, Part 9, Division 3) (v) enabling the ELC to require attendance of a PCBU in disciplinary hearings concerning an employee of that PCBU, if deemed necessary (Act, Part 9, Division 3) (vi) expanding the grounds for disciplining a licensed electrical worker to include failure to comply with a direction/notice (Act s 106) and a failure to rectify a defect as directed (Act s 112). (vii) consider implementing a definition of a "Influential Person" being a person who has control or has the ability to substantially influence a company's conduct. Further, consider enabling the ELC take disciplinary action against an influential person in disciplinary proceedings; and (d) empowering accredited auditors to require specific information from prescribed electricity entities, to fulfill duties as an accredited auditor (Act s130); and (e) removing the word 'just' from section 144(1)(b); and (f) removing section 141 and replacing it with section 171 of the Work Health and Safety Act 2011 for consistency; and (g) removing "regulator" in section 186B(1)(a) and replacing it with "WHS Prosecutor", to provide consistency with section 232(1)(a) of the Work Health and Safety Act 2011; and (h) replicating section 25 of the Work Health and Safety Act 2011, to provide consistency with the establishment of the WHS Prosecutor in the (Electrical Safety) Act; and (i) removing section 32 of the Regulations and replacing it with previous provision as per footnote3 3 Electrical Safety Regulation 2002 (Qld) repealed. 24A Misrepresentations about lawful authority to contract for the performance of electrical work (1) A person must not, in trade or commerce, represent that someone who is not a licensed electrical contractor may lawfully contract for the performance of electrical work the person may not otherwise perform under the Act. Example of electrical work that may be performed under the Act by someone who is not a licensed electrical contractor— minor emergency repairs to make electrical equipment electrically safe performed by a licensed electrical mechanic. Maximum penalty—40 penalty units. (2) An employer must take all reasonable steps to ensure the employer's workers do not contravene subsection (1). Maximum penalty—40 penalty units.
65	Consider requiring prescribed electricity entities to remove the potential for conflict of interest when engaging an accredited auditor to undertake the annual audit of their safety management system, by following measures to be set by the Regulator (s 234; Part 14A, Div 1).
	Specific regulatory reform proposals raised with the review (Chapter 10)
66	Consider phasing in a requirement for safety switches on all sub-circuits in all domestic, commercial and industrial settings, both on and off-grid. In addition, propose that Government work collaboratively to address potential cost impacts that may disproportionately affect vulnerable consumers.
67	Consider introducing a requirement for de-energisation prior to work near energised parts of an electrical installation, subject to necessary exemptions for energised work, such as testing for defects or faults in accordance with a risk assessment, safe work method and with appropriate Personal Protective Equipment (PPE). (a) further consider the introduction of requiring specific PPE when this work is undertaken including the required standard for working near exposed live parts (in accordance with Energy Safe Victoria's Arc Flash Hazard Management fact sheet); and (b) consideration is also to be given to requiring the PPE to be maintained and calibrated and tested to ensure it has the required integrity as per Australian Standards and is fit for purpose for use; and (c) consider implementing in the Regulations minimum standards for specific technologies such as thermography and airborne ultrasound sensors to ensure the safety of persons conducting electrical safety inspections on electrical installations.
68	Consider mandating a requirement for de-energisation of domestic roof spaces prior to work in or via the roof space, and require a safe work method statement, a documented risk assessment that includes the appropriate PPE on commercial and industrial roof spaces if de-energisation is not reasonably practicable.
69	Consider introducing a phased-in requirement for an electrical safety certificate to be issued by a licensed electrical worker, initially at the point of sale of a property and later every 5 years, confirming the property's electrical installation is safe and compliant with electrical safety standards and legislative requirements including, for example, safety switch requirements.

70	Consider a phased introduction of a requirement for a licensed electrical worker to perform an electrical safety inspection on all properties within five years of commencement of this requirement, and thereafter within five years of the last electrical safety inspection or receipt of an electrical safety certificate [see Recommendation 69, directly above], whichever is later. (a) it is further recommended for consideration that where an inspection identifies asbestos panels and boards within electrical switchboards, the homeowner must replace to meet current standards. It is suggested that homeowners have up to two years from the date of initial identification to rectify.
71	Consider introducing a requirement for builders' application processes to include a certificate to be issued by the relevant electricity entities, confirming building plans will not adversely impact any adjoining electricity infrastructure prior to building work commencing. Further it is suggested consultation across agencies will be required to effectively implement this change.
72	Consider the introduction of record keeping by the wholesaler or retailer at the point of sale of prescribed electrical equipment, being equipment that must be installed by a licensed electrical worker. Prescribed electrical equipment would include specified fixed wired electrical accessories, components and electrical appliances. The purchaser's name and address or other contact information and the specific equipment purchased must be recorded. It is recommended these records should be made available to the Electrical Safety Office on request for the purposes of regulatory activities such as assisting with recalls and identifying unlicenced electrical work in the interest of electrical safety.
73	Consider clarifying electric lines regulations (Regulations, Part 5) to limit the occurrence of contact with electric lines and the integrity of electricity infrastructure, by considering: (a) clarifying what is within the scope of a "service line" (s 76), noting the definition of overhead electric line (s 79(2)) (b) clarifying requirements for demolition companies registering with electricity retailers to request line/meter removal (c) requiring PCBUs to keep structures outside clearance requirements (Schedule 4, s 69), including for PCBUs to ensure any builder or contractor it engages to construct a structure, to not do so within clearance requirements (d) requiring duty holders to carry out location activities for underground electric lines including by manual activities, sourcing services (where required) and "dial before you dig" prior to excavation work (i.e. underground work that is not of a superficial nature, e.g. gardening on private property), to prevent incidents of contact with underground electric lines (s 68). (i) It is further recommended to remove the reference to underground electric lines in the Regulation at s 68(1) and creating a third sub-section to mirror requirements in the Work Health and Safety Regulation 2011 s 304. (e) requiring persons planning fires near and adjacent to electricity infrastructure within a specified distance of lines, to consult and cooperate with the relevant electricity entity for those lines (f) creating an offence to cause damage to electrical infrastructure/an entity's assets to cause, or risk, unsafe condition/network, including in relation to overhead or underground electric lines (Pt 5) and climbing poles (Pt 15, s 278) (g) reviewing the wording of the example of harvesters in the definition of "operating plant" (Regulations, Sch 9), to ensure the example is adapted to the functioning of modern grain harvesters, particularly those with attachments that do not move vertically or are retracted and therefore pose a lower risk to electric lines.
74	Consider clarifying and enhancing standards that apply to electrical installations (Regulations, Part 6), including by considering: (a) removing the date (1 June 1992) to ensure safety switch requirements apply to outlets generally (ss 84-5) (b) requiring licensed electrical workers to comply with applicable standards in addition to the Wiring Rules (s 70) (c) ensuring there is a legislative basis in the Act for regulations concerning work involving water equipment (s 72), and, if it is to be maintained, work involving electric motors (s 73) (d) updating the examples of facilities that may be provided by a person in control (s 76) (e) requiring a licensed electrical worker or a licensed electrical contractor, prior to undertaking electrical installation work in a domestic premise, to confirm the existence of or install an independent earth electrode (s 86) (f) strengthening requirements on persons in control to fix defect through the inclusion of "agents of an entity"
75	Consider clarifying and enhancing in-scope electrical equipment-related standards and sanctions (Act, Part 2A; Regulations Part 7).
76	Consider enhancing the regulation of unsafe electrical equipment, including by requiring removal from sale, appropriate notifications are made, and relevant documentation kept (Regulations Parts 8), particularly consideration to be given to Requiring responsible suppliers to: (a) keep documents required by equipment safety rules (Regulations s 147-8); and (b) advise clients not to sell items found to be unsafe, subject to a penalty. In respect of officers, the intent of this recommendation could be achieved by: (c) requiring officers to ensure a recall is conducted on items found to be unsafe, including in the context of liquidation, consistent with corporations' law. (Act, Part 2, Div 2B). In respect of retailers, the intent of this recommendation could be achieved by: (d) requiring retailers to cease selling unsafe items, subject to a penalty for continuing to knowingly sell unsafe items (e) empowering the regulator to direct that unsafe electrical equipment be removed from display and sale (Act, s 146ff.)

	(f) require warning signs both near and on products, and, through the development of communication material, assist retailers to display general DIY warning signs in relevant areas of stores or online environments, to help to ensure purchasers are competent to install the equipment. (g) ensure the jurisdiction of the Act extends to electrical equipment sold on online platforms in Queensland (Act, Part 2) (h) reviewing the use of the term "competent person" for consistency in Part 8 (Regulations ss 186, 194). Further, to assist in regulating safe electrical equipment, consideration should be given to: (i) clarifying that the regulator is not obliged to issue certificates on equipment, allowing flexibility to engage private certifiers with regulator monitoring and oversight (ss 122, 154-9) (j) a requirement for test and tag contactors and competent persons to be required to include contact information such as name and phone number on test and tags attached to electrical equipment enabling the Electrical Safety Office to identify contractors/businesses and carry out regulatory actions as needed (k) implement a requirement for test and tag contractors and competent persons to remove from service any equipment that has been deemed to be unsafe through the test and tag process. Further, where the individual holds an appropriate electrical licence, repair like for like such as cords and plug tops.
77	Consider amending the regulation of works of an electricity entity (Regulation, Part 9) to ensure the integrity of works considering contemporary development of practices and technology, including by considering: (a) expanding the meaning of trafficable area to include areas with agriculture (sections 207(1)(a) and 208(1)(a); Schedule 4). (b) requiring an electricity entity to periodically inspect and maintain assets/network infrastructure (s 215).
78	Consider enhancing and clarifying the regulation of electricity supply, including inspection and record keeping requirements, as well as the scope of private generating plant (Regulations, Part 10) to ensure it remains contemporary, including by considering: (a) implementing a requirement, for high voltage or hazardous area electrical installations, accredited auditor inspection and testing to be evidenced by providing a certificate of inspection and confirmation (with prescribed content stipulated in the Regulations) to the Regulator via electronic portal (Recommendation 45) (s 221(1)(b)) (b) clarifying that the requirement for accredited auditors to conduct an inspection following electrical installation work does not apply to 'like for like' changes of electrical equipment in the electrical installation (c) ensuring renewables and off-grid storage are within the meaning of private generating plant, thereby requiring compliance with the Wiring Rules (s 224) and requirements for safe and stable parallel operation with the works of the electricity entity (s 225). (d) ensuring the effectiveness of duties to keep records of test results and the working behind them in the context of licensed contractors testing electrical work for safety (ss 226-230). Test results to be submitted to the Regulator through the reporting portal (Recommendation 45). (e) Consider adding disconnection requirements for disconnection of electrical installation to electricity source (s220)
79	Consider clarifying and enhancing the requirements for safety management systems (SMS) (Regulations, Part 11), including by considering: (a) clarifying the requirements regarding both the contents of and need to supply the Regulator with annual audit plans, audit reports, corrective action plans, and risk management plans (s 234); and (b) requiring prescribed electricity entities to provide risk management plans to the Regulator, in addition to maintaining a SMS (s 234(3c), (4a)).
80	Consider clarifying one matter related to accredited auditors (Regulations, Part 12) by allowing for the appointment of temporary accredited auditors, for the duration of a specified period to audit accredited auditors (ss 235, 237; Act s 136A).
81	Consider amending the Serious Electrical Incident and Dangerous Electrical Event notification and reporting requirements to ensure they remain contemporary and to clarify miscellaneous requirements (Regulations, Part 14), including by considering: (a) requiring distribution entities to notify the Regulator of Serious Electrical Incidents and Dangerous Electrical Events even if they are not the distribution entity whose works are the subject of the incident, or that supplies electricity to the electrical equipment that is the subject of the incident (Regulations ss 264, 266(1)(b)); and (b) clarifying that off-grid contexts are within the reporting required by distribution entities for electric shock (Regulations s 267); and (c) requiring prescribed electricity entities to publish reports of incidents occurring in each calendar year, within three months of the end of the relevant year (Part 14, Schedule 6).
82	Consider amending miscellaneous provisions in the Regulations to ensure safety is maintained in various contexts (Regulations, Part 15), including: (a) clarifying that the Act applies to greenfield petroleum plant sites not operating as petroleum plants (Regulations s 276; Act, s 6) (b) expanding the ability of transmission entities to act in make safe circumstances, similar to the abilities of distribution entities (s 280 and ss 269, 271) (c) requiring principal contractors to engage an electrical contractor to investigate and, where appropriate, issue and upload to the Electrical Safety Office portal electrical isolation certificates (Recommendation 45) for demolition and dismantling work providing sufficient information to identify: (i) the precise area isolated; and (ii) the method of isolation, including use of lockout and tag-out means and testing to prove de-energisation, and

	(iii) any cabling or fittings removed and remaining. (d) requiring further electrical isolation certificates where there is an extension of the scope of demolition and dismantling work including uploading to the Electrical Safety Office portal (Recommendation 45). (e) Consider expanding electricity entity authorisation requirements for climbing poles, standard or other structure that is part of the works of an electrical entity to include working on poles, standard or other structures that are part of the works of an electricity entity (s 278).
83	Consider correcting administrative matters in the Act and Regulation that have been identified in the course of the review, including: In the Act: (a) removing the incorrect reference in Act s 32(3) to sub-section (1)(b) and replacing it with a reference to sub-section (2)(b) (b) removing outdated reference to the department's website as "www.justice.qld.gov.au" at s 48K (7) (c) including the Labour Hire Licensing Act 2017 to list of Acts enabling the Electrical Safety Office to share information with the Labour Hire Licensing Compliance Unit (d) removing transitional provisions no longer considered necessary or effective, based on consultation with the Office of the Queensland Parliamentary Counsel (Parts 15-22). In the Regulations: (e) changing reference from "one month" to a specific number of days, namely "28 day" in ss 49-50 (f) removing incorrect reference to Schedule 9, paragraph (c) in at s 279 (g) removing transitional provisions no longer considered necessary or effective, based on consultation with the Office of the Queensland Parliamentary Counsel (Part 16).

Appendices

Appendix 1: Amendments to the *Electrical Safety Act 2002* from time-to-time

Appendix 2: Consequential amendments to the *Electrical Safety Act 2002* to mirror the provisions of the national model WHS Act

Appendix 3: Electrical Safety Act review work plan

Appendix 4: Industry reference group membership list

Appendix 5: Industry Reference Group Terms of Reference

Appendix 6: Issues Paper – March 2021 (Review of Queensland's *Electrical Safety Act 2002*)

Appendix 7: Schedule of the written submissions to the Review

Appendix 8: Working Group membership list and meeting overviews

Appendix 9: *Improving Electrical Safety in Queensland: A Report by the Commissioner for Electrical Safety*

Appendix 10: EESS reform proposals raised with the Review

Appendix 1: Amendments to the *Electrical Safety Act 2002* from time-to-time

2003

Workplace Health and Safety and Other Acts Amendment Act 2003 No. 18 ss 1, 2(2), 37 sch

- date of assent 09 May 2003
- ss 1–2 commenced on date of assent
- remaining provisions commenced 1 June 2003 (2003 SL No. 101)

Training Reform Act 2003 No. 63 ss 1, 2(2), 60 sch

- date of assent 13 October 2003
- ss 1–2 commenced on date of assent
- remaining provisions commenced 1 January 2004 (2003 SL No. 293)

2004

Petroleum and Gas (Production and Safety) Act 2004 No. 25 ss 1, 2(2), ch 16 pt 6

- date of assent 12 October 2004
- ss 1–2 commenced on date of assent
- remaining provisions commenced 31 December 2004 (2004 SL No. 308)

Workers' Compensation and Rehabilitation and Other Acts Amendment Act 2004 No. 45 ss 1–2(1)–(2), pt 4, s 116 sch

- date of assent 18 November 2004
- ss 1–2 commenced on date of assent
- s 118 (1) commenced 1 February 2005 (see s 2 (2))
- s 120 commenced 1 January 2005 (see s 2 (1))
- remaining provisions commenced on date of assent

2007

Statute Law (Miscellaneous Provisions) Act 2007 No. 36

- date of assent 29 August 2007
- commenced on date of assent

Workers' Compensation and Rehabilitation and Other Acts Amendment Act 2007 No. 52 ss 1–2(1)–(2), pt 3

- date of assent 09 November 2007
- ss 1–2 commenced on date of assent
- ss 34, 47 commenced 1 March 2008 (see s 2 (1)–(2))
- remaining provisions commenced 1 January 2008 (see s 2 (1))

2008

Professional Engineers and Other Legislation Amendment Act 2008 No. 14 s 1, pt 4

- date of assent 23 April 2008
- commenced on date of assent

Workplace Health and Safety and Other Legislation Amendment Act 2008 No. 61 ss 1, 2(3), pt 3

- date of assent 25 November 2008
- ss 1–2 commenced on date of assent
- remaining provisions commenced 1 January 2009 (see s 2 (3))

Transport and Other Legislation Amendment Act 2008 No. 67 s 1, pt 3 div 4

- date of assent 01 December 2008
- commenced on date of assent

2009

Greenhouse Gas Storage Act 2009 No. 3 s 1, ch 9 pt 5

- date of assent 23 February 2009
- commenced on date of assent

Criminal Code and Other Legislation (Misconduct, Breaches of Discipline and Public Sector Ethics) Amendment Act 2009 No. 25 pt 1, s 83 sch

- date of assent 11 August 2009
- ss 1–2 commenced on date of assent
- remaining provisions commenced 2 November 2009 (2009 SL No. 241)

Electrical Safety and Other Legislation Amendment Act 2009 No. 38 ss 1, 2(2), pt 2

- date of assent 22 September 2009
- commenced on date of assent

2010

Transport and Other Legislation Amendment Act (No. 2) 2010 No. 19 s 1, ch 2 pt 5

- date of assent 23 May 2010
- commenced on date of assent

City of Brisbane Act 2010 No. 23 ss 1–2(1), ch 9 pt 1

- date of assent 17 June 2010
- ss 1–2 commenced on date of assent
- remaining provisions commenced 1 July 2010 (see s 2 (1))

2011

Electrical Safety and Other Legislation Amendment Act 2011 No. 4 ss 1, 2(1)(a), (c), pt 2, s 69 sch pt 2

- date of assent 04 April 2011
- ss 1–2, 69 commenced on date of assent
- sch pt 2 amdt 1 commenced 26 October 2012 (2012 SL No. 190)
- remaining provisions commenced 1 March 2013 (2012 SL No. 190)

Transport and Other Legislation Amendment Act 2011 No. 12 s 1, pt 5

- date of assent 14 April 2011
- commenced on date of assent

Work Health and Safety Act 2011 No. 18

- date of assent 06 June 2011
- various commencement dates

Civil Partnerships Act 2011 No. 46 ss 1–2, pt 6 div 8

- date of assent 06 December 2011
- ss 1–2 commenced on date of assent
- remaining provisions commenced 23 February 2012 (2012 SL No. 15)

2012

Civil Partnerships and Other Legislation Amendment Act 2012 No. 12 pt 1, s 59(3) sch pt 3

- date of assent 27 June 2012
- commenced on date of assent

Guardianship and Administration and Other Legislation Amendment Act 2012 No. 37 ss 1–2(1), pt 4

- date of assent 22 November 2012
- commenced on date of assent

2013

Queensland Rail Transit Authority Act 2013 No. 19 ss 1, 120 sch 1

- date of assent 03 May 2013
- commenced on date of assent

Liquor and Gaming (Red Tape Reduction) and Other Legislation Amendment Act 2013 No. 25 ss 1, 190 (amends 2011 No. 18 above)

- date of assent 03 June 2013
- commenced on date of assent

Treasury and Trade and Other Legislation Amendment Act 2013 No. 39 ss 1, 109 sch 2, 110 sch 3 pt 2

- date of assent 23 September 2013
- commenced on date of assent

Criminal Law (Criminal Organisations Disruption) and Other Legislation Amendment Act 2013 No. 64 ss 1, 2(3), pt 8

- date of assent 27 November 2013
- ss 1–2 commenced on date of assent
- remaining provisions commenced 1 July 2017 (see s 2 (3) (as amended by 2015 No. 4, 2016 No. 31 and 2016 No. 62))

2014

Work Health and Safety and Other Legislation Amendment Act 2014 No. 14 pts 1–2

- date of assent 09 April 2014
- ss 1–2 commenced on date of assent
- remaining provisions commenced 16 May 2014 (2014 SL No. 59)

Further Education and Training Act 2014 No. 25 ss 1–2, 223 sch 1 pt 2

- date of assent 21 May 2014
- ss 1–2 commenced on date of assent
- remaining provisions commenced 1 July 2014 (2014 SL No. 102)

Electricity Competition and Protection Legislation Amendment Act 2014 No. 48 pts 1–2

- date of assent 26 September 2014
- ss 1–2 commenced on date of assent
- remaining provisions commenced 1 July 2015 (2014 SL No. 335)

2015

Payroll Tax Rebate, Revenue and Other Legislation Amendment Act 2015 No. 4 s 1, pt 2 (amends 2013 No. 64 above)

- date of assent 11 June 2015
- commenced on date of assent

Workers' Compensation and Rehabilitation and Other Legislation Amendment Act 2015 No. 13 s 1, pt 3 div 1

- date of assent 24 September 2015
- commenced on date of assent

Work Health and Safety and Other Legislation Amendment Act 2015 No. 16

- date of assent 22 October 2015
- ss 1–2 comm on date of assent
- remaining provisions comm 8 April 2016 (2016 SL No. 29)

Relationships (Civil Partnerships) and Other Acts Amendment Act 2015 No. 33

- date of assent 17 December 2015
- pts 1–6, s 52 sch 1 comm 22 March 2016 (2016 SL No. 14)

2016

Penalties and Sentences (Queensland Sentencing Advisory Council) Amendment Act 2016 No. 31 pts 1, 2A (amends 2013 No. 64 above)

- date of assent 14 June 2016
- commenced on date of assent

Serious and Organised Crime Legislation Amendment Act 2016 No. 62 s 1, pt 8 (amends 2013 No. 64 above)

- date of assent 09 December 2016
- commenced on date of assent

2017

Workers' Compensation and Rehabilitation (Coal Workers' Pneumoconiosis) and Other Legislation Amendment Act 2017 No. 27

- date of assent 31 August 2017
- comm on date of assent

Work Health and Safety and Other Legislation Amendment Act 2017 No. 38

- date of assent 23 October 2017

pt 1, pt 2 divs 1–2, pt 3 divs 1–2 comm on date of assent

Appendix 2: Consequential amendments to the *Electrical Safety Act 2002* to mirror the provisions of the national model WHS Act

Amendments to the electrical safety laws in Queensland (Office of Industrial Relations summary prepared in 2014)

- On 1 January 2012, the *Work Health and Safety Act* 2011 (WHS Act) commenced, adopting the nationally agreed model Work Health and Safety Act.
- On 1 January 2014, amendments to align the *Electrical Safety Act 2002* (ES Act) with the WHS Act will commence.
- Will mean some changes, however it will be largely business as usual, particularly since the new concepts introduced into the ES Act are already being used in the WHS Act.

Electrical Safety Act 2002

- The term "duty" replaces "obligation"
- Duties are subject to "so far as is reasonably practicable" (by reference to the meaning of *electrically safe* and *free from electrical risk*. This is consistent with the concept of *as low as is reasonably achievable* which is currently used in the ES Act)
- A new proactive duty on officers – the same as the duty imposed on officers under the WHS Act
- New definition of "worker" to align with the WHS Act
- Move to three new categories of offences to align with the offence provisions in the WHS Act
- Enforceable undertaking requirements consistent with the WHS Act
- Inspectors have similar powers of entry, seizure and investigation for the purposes of ensuring compliance with electrical safety legislation
- A new range of sentencing options for courts including adverse publicity orders, restoration orders, electrical safety projects, injunctions and training orders
- A new statutory notice, non-disturbance notice will be available to allow inspectors to secure an incident scene
- Persons seeking an external review of a decision can now apply to Queensland Civil and Administrative Tribunal rather than the Industrial Court
- Appeals up to the High Court of Australia
- 10-year automatic expiry required the review of the 2002 Regulation
- Consultation Regulatory Assessment Statement released for public comment from 28 March 2013 to 26 April 2013 – with three options
- Red-tape reduction initiatives included:
    - changes to testing and tagging requirements in workplaces
    - removal of six-monthly prohibition of work performed by an apprentice or trainee (s209)

    - extension of s21 rescue and resuscitation training requirements to 12 months
    - changes to regulatory requirements for cathodic protection systems
- As a result of the State Coroner's findings from the inquest into the former Home Insulation Program electrocution fatalities, it is not considered appropriate to progress the red tape reduction initiatives until further analysis of the findings in the context of these initiatives has been undertaken.

Electrical Safety Regulation 2013

- Essentially remakes the 2002 Regulation
- Minor changes to match terminology/concepts in the amended Act from 1 January 2014 (e.g. duties, reasonably practicable)
- Adoption of some general provisions of the WHS Regulation for consistency reasons (e.g. Part 3.1 Risk management)
- Adoption of certain parts of Part.4.7 Electrical Safety and Energised Electrical Work of the model WHS Regulation
- A complete renumbering of the Regulation.

Part 1 Preliminary

- No significant changes other than adoption of certain model provisionss8 - links a regulatory duty back to a duty under the Act
- s9 - provides that a regulatory duty does not limit a duty under the Act
- s10 - provides circumstances where a risk assessment may be conducted in relation to a class of hazards, tasks, circumstances or things.

Part 2 General risk management

- This part provides a link back to the general risk management provisions of Part 3.1 of the WHS Regulation.

Part 3 Electrical work

- Live work requirements are essentially unchanged
- Safety observer competency assessment period is now 1 year
- PCBU must ensure electrical equipment is de-energised before electrical work is carried out and that it cannot be inadvertently re-energised
- High voltage live line work is essentially unchanged.
- Mandatory 6 monthly requirements for testing and maintenance of safety equipment removed (PCBUs still have a duty to ensure tools and equipment are maintained in good working order)
- The following provisions are unchanged:
    - Testing of electrical work
    - Certificates of test
    - Equipment with serious defect not to be connected to supply
    - Rescue and resuscitation training for electrical workers and assistants
    - Provisions relating to misrepresentation relating to electrical work.

Part 4 Licensing

- No significant changes – streamlining and terminology.

Part 5 Overhead and underground electric lines

- The PCBU must so far as is reasonably practicable ensure that no person, plant or thing at a workplace comes within an unsafe distance from overhead and underground electric lines
- If not reasonably practicable to ensure a safe distance, PCBU must conduct a risk assessment and consult with entities (if they are responsible for the line)
    - Requirement to consult remains
    - Control measures must be implemented in accordance with risk assessment and advice from the entity
- Retains exclusion zones (Schedule 2) and supporting concepts (exclusion zones only relate to overhead electric lines)
- Supported by the Electrical Safety Code of Practice 2010 - *Working near overhead and underground electric lines*
- Managing risk around other exposed energised electrical parts is to be managed through application of risk management principles and supporting codes of practice
- There are no significant changes to the following parts other than re-numbering
- **Part 6 Electrical installations**
    - Note: no changes to current test and tag/RCD requirements in workplaces
- **Part 7 In-scope electrical equipment**
- **Part 8 Electrical equipment – general**
- **Part 9 Works of an electricity entity**
- **Part 10 Electrical supply**
- **Part 11 Safety management systems**
- **Part 12 Accredited auditors**
- **Part 13 Cathodic protection systems**
- **Part 14 Incident notification and reporting**
    - Incident notification and reporting provisions adopt the WHS Act requirements
    - Requirements to ensure an incident scene is not interfered with remain but also adopt the WHS Act provisions.

<u>Codes of Practice</u>

New codes

- Code of Practice - How to manage work health and safety risks
- Electrical Safety Code of Practice 2013 - Managing electrical risks in the workplace (based on model code, this replaces ES CoP 2010 - Electrical work).

Retained codes (amended to align with WHS Regulation terminology)

- Electrical Safety Code of Practice 2010 - Works

- Electrical Safety Code of Practice 2010 - Working near overhead and underground electric lines (varied and renamed version of the ES CoP 2010 - Working Near Exposed Live Parts)
- Electrical Safety Code of Practice 2010 - Electrical Equipment Rural Industry.

Repealed codes

- Electrical Safety Code of Practice 2010 - Risk Management
- Electrical Safety Code of Practice 2010 - Electrical Work.

Appendix 3: Electrical Safety Act review work plan

Work items	2020	2021											
	Q4 2020	Q1 2021			Q2 2021			Q3 2021			Q4 2021		
	December	January	February	March	April	May	June	July	August	September	October	November	Dec
Minister appoints reviewer													
Preliminary meetings between OIR executives and reviewer													
OIR to send email announcement of ES Act review to stakeholders													
Email invitations to industry reference group members													
First meeting of reference group													
Industry reference group meetings as determined by reviewer													
Reference group review of issues paper													
Reviewer conducts one on one consultation meetings with key stakeholders													
Publication of issues paper online													
Deadline for written submissions close (6-week timeframe)													
Reviewer conducts one on one follow up meetings with key stakeholders													
Prepare draft report and recommendations													
Draft report and recommendations provided to DDG and Minister													
Finalisation of report and recommendations													
Final report provided to the DDG and Minister													

Appendix 4: Industry Reference Group membership list

Member of the Industry Reference Group (organisation)	Inclusion	Representative on IRG
Reviewer **– appointed by Minster Grace Grace to undertake the review of the Act, to consider and recommend legislative changes that will ensure the state's electrical safety framework is fit to achieve its purpose of preventing death, injury or loss of property.**	Independent – Chair of IRG	Mr Dick Williams
Director – **Advisor to the Reviewer.**	Advisor to the Reviewer	A/Director Supply and Networks (ESO)
Australian Energy Council (AEC) **- an organisation that represents the transmission and distribution sector and a number of entities.**	To ensure transmission and distribution sector of the industry is represented and appropriately considered in the review.	Carol Tran
Clean Energy Council (CEC) **–organisation that represents over 600 leading businesses in renewable energy (e.g. solar and wind).**	To ensure consideration of the perspective of businesses in alternative energy generation.	Robbie Nichols Technical Team Leader
Contractor (non-aligned) **POWINS is an electrical contractor that is an electrical solutions provider servicing the mining and heavy industry sectors. POWINS capabilities include all civil, electrical, commissioning, site service and engineering assistance.**	To ensure independent representation of the electrical contracting sector non-aligned to a peak industry body.	Dean van Wijk General Manager
Electrical Safety Commissioner **– The *Electrical Safety Act 2002* establishes the Electrical Safety Commissioner, who advises and makes recommendations to the Minister about policies, strategies and legislation. The Commissioner for Electrical Safety is Greg Skyring who is also the Chair of the Electrical Safety Board (ESB) and committees.**	To ensure regulations are consistent with standards and community expectations of electrical safety and do not present unintended electrical risks that cannot be managed.	Greg Skyring Commissioner for Electrical Safety
Electrical Trades Union (ETU) **– represents electrical workers in Queensland and the Northern Territory, with a focus on safety, licensing, and training of members.**	To ensure consideration of the perspective of electrical workers, through a peak representative organisation with a focus on safety.	Keith McKenzie Assistant State Secretary
Energy Queensland **- is the group of electricity distribution, retail and energy services businesses 100% owned by the state of Queensland.**	To ensure the distribution sector of the industry is represented and appropriately considered in the review.	Michelle Taylor Manager, Intelligent Grid New Technology

Energy Skills Queensland (ESQ) **-is the leading, independent, not-for-profit organisation providing innovative solutions to enable a skilled and safe energy industry.**	To ensure independent representation of the skilling sector is considered.	David Cross CEO
Master Electricians Australia (MEA) **– representative organisation for electrical contractors.**	To ensure consideration of the perspective of electrical contractors.	Malcolm Richards Chief Executive Officer
National Electrical and Communications Association (NECA) QLD **– association aimed at informing members of the latest industry developments, and providing advice and support.**	To ensure consideration of the perspective of electrical and communications businesses.	Peter Lamont Executive Director
NHP **and** Schneider Electric **are electrical product developers and manufacturers. Both organisations are also involved in developing new and emerging products and methodologies.**	To ensure consideration of product development and sales.	Nick Thompson NHP Ed Arendt Schneider Electric
Smart Energy Council (SEC) **–organisation that represents over 1000 members in solar, storage and smart energy management.**	To ensure consideration of the perspective of businesses in smart energy management.	John Grimes Chief Executive Officer
Powerlink **– A Queensland Government owned organisation that delivers transmission services across Queensland.**	To ensure consideration of the perspective of entities that transmit electricity	Tony Niven Senior Electrical Safety Specialist
Stanwell Corporation - **a Queensland government-owned corporation and is the state's largest electricity generator.**	To ensure the generation sector of industry is represented and appropriately considered during the review.	Dave Lavender Michael Joy Kriss Ussher
Work and Electrical Safety Policy (WESP) **and** Electrical Safety Office (ESO) **– develops and enforces standards for electrical safety, delivers electrical safety services in Queensland and promotes improved safety performance.**	To ensure regulations are consistent with existing electrical safety standards and do not present unmanageable, unintended risks.	Jodie Deakes, Executive Director, WHS Engagement and Policy Services Donna Heelan, A/Executive Director, Electrical Safety Office Andrea Fox, Director, Work and Electrical Safety Policy (WESP) Rebekah Jensen, Manager, WESP (to August 2021) / Janine McPherson, A/Manager, WESP (from August 2021) John Alizzi, Principal Policy Officer, WESP Kirsty McLean and Tobias Reeves, Policy Officers, WESP
Resources Safety and Health Queensland	To ensure consideration of the resources sector where they use Electrical Safety Legislation.	Neville Atkinson

Appendix 5: Industry Reference Group Terms of Reference

Legislative review of the *Electrical Safety Act 2002 (Qld)* – Industry Reference Group

Terms of Reference

Background

The electrical safety laws in Queensland were last reviewed in 2002, when the *Electrical Safety Act 2002* (Qld) (the Act) was introduced. Since this time the relevant technological landscape has changed significantly, with electricity generation, supply and distribution transforming in ways not contemplated 20 years ago.

On 10 August 2020, the Honourable Grace Grace MP, Minister for Education, Minister for Industrial Relations and Minister for Racing, accepted all nine recommendations made in the Electrical Safety Commissioner's report, *Improving Electrical Safety – a report by the Commissioner for Electrical Safety*, which responded to electrical safety concerns around work on solar farms in Queensland.

This included the first recommendation of the Commissioner's Report, that the Queensland Government should undertake a review of the Act including "the objects of the Act and regulation-making powers, to ensure it is fit for purpose and can keep pace with new and emerging technologies".

Mr Dick Williams has been appointed by the Minister to undertake the review of the Act, to consider and recommend legislative changes that will ensure the state's electrical safety framework is fit to achieve its purpose of preventing death, injury or loss of property.

Purpose of the Industry Reference Group

To assist with the identification and consideration of relevant issues, concerns and solutions, Mr Williams will lead a process of consultation with an extensive range of stakeholders and interested parties in Queensland.

As part of this consultation process, an Industry Reference Group (IRG) is being convened as a small, targeted committee of representatives from industry, union and social partners. The objective of the IRG is to facilitate detailed consideration of key issues raised by stakeholders during this consultation, and to provide feedback on reform proposals that are generated in the review process.

The function of the IRG will be advisory in nature, with decisions about the recommendations of the review remaining with Mr Williams as the appointed Reviewer.

Members

The IRG will be chaired by Mr Williams. Membership of the IRG is based on expertise and relevance to electrical safety in Queensland, including:

- Electrical Trades Union (ETU)
- Master Electricians Australia (MEA)
- National Electrical and Communications Association (NECA)
- Clean Energy Council (CEC)
- Smart Energy Council (SEC)
- Commissioner for Electrical Safety
- Office of Industrial Relations
- Australian Energy Council (AEC)
- Director – Advisor to the Reviewer
- Independent Contractor – POWINS
- Energy Queensland
- Energy Skills Queensland
- Manufacturers – NHP and Schneider Electric.

Secretariat

Meetings of the IRG will be facilitated and coordinated with the assistance of the secretariat for the review of the Act, including Mr Williams' staff as well as members of OIR's Work and Electrical Safety Policy team.

Meeting

The IRG will meet on a monthly basis, with members being advised of the meeting dates and agenda in advance by the secretariat. Meetings will be chaired by Mr Williams. The duration of meetings may vary on the basis of the matters for discussion.

Meeting arrangements will accord with the appropriate community isolation measures to minimise the risk from COVID-19, as required by the Queensland State Government.

In the event that a meeting in person can be achieved safely, the IRG will meet in OIR office locations including but not limited to 1 William Street, Brisbane, 347 Ann St, Brisbane and office locations across South East Queensland. Meetings may be conducted by telephone or videoconference (e.g. Microsoft Teams) in the alternative.

Where a member's absence is unavoidable at a scheduled meeting, any proxies that are sent to attend meetings must have appropriate authority to represent their organisation.

Conflict of Interest

Any perceived conflict of interest must be disclosed to the Chair as soon as the potential conflict has come to the member's knowledge.

Appendix 6: Issues Paper – March 2021 (Review of Queensland's *Electrical Safety Act 2002*)

Review of Queensland's *Electrical Safety Act 2002*

Issues Paper – March 2021

Foreword

The Queensland Government's Office of Industrial Relations (OIR) is responsible for the development and enforcement of electrical safety standards across the State. As the Queensland Government works to transition Queensland to a low carbon future and embrace the technologies that will drive lower prices and increased energy efficiency for electricity customers, the focus must also remain on ensuring the state's electrical safety legislative framework remains able to keep pace with new and emerging technologies.

I am therefore pleased to be leading the review of the *Electrical Safety Act 2002* (Qld), and I am strongly committed to listening to and considering the views of interested parties. This issues paper forms the foundation of my approach to stakeholder consultation and I strongly encourage any interested party to put forward a submission. The information in the submissions I receive in response to this issues paper will be carefully considered and may very well form the key recommendations arising from this review.

An Industry Reference Group (IRG) has been formed, with representation by key industry stakeholders from all sectors across the electrical industry in Queensland. The IRG will consider the issues and provide information to inform recommendations. The IRG had its inaugural meeting on Friday 29 January 2021 where key principles were endorsed to guide the work of this review:

- The best outcome be achieved for safety in the industry, for those who work in it as well as consumers and the general public.
- Legislation designed to eliminate risks at the source.
- Legislation drafted in plain English for readability, comprehension and usability by anyone.
- Duties, responsibilities and accountability of businesses and workers are clear and achieve the objectives of the Act.
- Ensure the highest common denominator adopted when drafting and aligning legislation, noting the need for sensible and practical outcomes.

I look forward to undertaking this review and working with all stakeholders to ensure the best outcomes for electrical safety in Queensland is achieved.

Mr. Dick Williams
Reviewer

Introduction

The Queensland Government's Office of Industrial Relations (OIR) is responsible for the development and enforcement of electrical safety standards across the State. As the Queensland Government works to transition Queensland to a low carbon future and embrace the technologies that will drive lower prices and increased energy efficiency for electricity customers, an important focus of OIR is ensuring that the state's electrical safety legislative framework remains able to keep pace with new and emerging technologies.

Queensland's current electrical safety laws were last reviewed in 2002 when the *Electrical Safety Act 2002* (Qld) (the Act) was introduced. Since this time the relevant technological landscape has changed significantly, with electricity generation, supply and distribution transforming in ways not contemplated 20 years ago.

On 25 June 2019, the Queensland Minister for Education, Minister for Industrial Relations and Minister for Racing, the Honourable Grace Grace MP (the Minister), announced that the Electrical Safety Commissioner, Mr Greg Skyring (the Commissioner), would convene a roundtable to discuss safety in large-scale solar farms. This followed a judicial decision finding that regulations about safety on solar farms did not fall within the powers granted under the Act. As part of this announcement the Minister noted that the "decision clearly highlighted that Queensland's electrical safety laws had not kept pace with new and emerging technologies, including large-scale solar farms".

In January 2020 the Commissioner drew on the outcomes of the roundtable process, as well as his broader experience as Commissioner, to deliver findings and recommendations to the Minister in the form of *Improving Electrical Safety in Queensland: A Report by the Commissioner for Electrical Safety* (the Commissioner's Report). A copy of the Commissioner's Report has been published alongside this issues paper.

The first recommendation of the Commissioner's Report was that the Queensland Government should undertake a review of the Act, including "the objects of the Act and regulation-making powers, to ensure it is fit for purpose and can keep pace with new and emerging technologies".

In August 2020, the Minister announced a review of the *Electrical Safety Act 2002* (Qld) (the Review) to be undertaken by an external Reviewer with the support of a departmental secretariat within OIR.

Mr Dick Williams was appointed to lead the Review in December 2020, on the basis of his detailed knowledge and understanding of electrical safety, real-world industry experience, strong working relationships within the industry sector, and his extensive experience overseeing important collaborative work involving government and industry, including in his current role as the Chair of the Queensland Building and Construction Commission (QBCC) Board.

About this Review

The purpose of the review of the *Electrical Safety Act 2002* (Qld) (ES Act) is to consider what legislative changes are necessary to ensure Queensland's electrical safety laws are fit-for-purpose, specifically in relation to new and emerging technologies.

Scope of the Review

The Review will focus on the *Electrical Safety Act 2002* (Qld) (the Act), including its objects and regulation-making powers, as well as any necessary related changes to subordinate legislation. The Review's assessment of the Act will be focused on, but not limited to, addressing the needs identified in the Commissioner's Report:

- ensuring the relevance and effectiveness of definitions;
- ensuring the relevance and effectiveness of duties and requirements;
- aligning the Act with existing work health and safety legislation; and
- future-proofing the Act for new and emerging energy technologies including renewable energy generation and storage devices.

The Review will not include an assessment of other state-based, federal or applied national laws in relation to electrical safety. While stakeholders may have views on these matters, they are outside the scope of this review. However, models or provisions from other jurisdictions that are identified as 'best practice' by the Reviewer or stakeholders may be considered as part of the Review.

Overview of Queensland's electrical safety laws

The *Electrical Safety Act 2002* (Qld) (the Act) establishes a legislative framework to define and regulate electrical safety standards across the State, with the aim of preventing people being killed or injured by electricity, and property being destroyed or damaged by electricity.

In addition to outlining electrical safety definitions and duties, the Act sets out an electrical safety framework that:

- establishes safety management systems for electrical entities (including power authorities and Queensland Rail)
- provides a system of licensing for electrical workers and contractors
- establishes standards for both industry and the public through the *Electrical Safety Regulation 2013* and codes of practice
- establishes compliance and enforcement including penalties for breaches of the ES Act
- provides consumer protection against electrical work not being properly performed or completed
- establishes a consultation structure through the Electrical Safety Board and associated committees, with functions including participation in development of requirements for the electrical safety of electrical equipment.

The Act is supported by the *Electrical Safety Regulation 2013* (Qld) (the Regulation), and five electrical safety codes of practice.

The Regulation provides further detailed information on how duty holders must meet the electrical safety requirements of the Act. The electrical safety codes of practice give practical advice to duty holders on how to meet their electrical safety responsibilities, in relation to particular hazards or risks.

Approach

The review will incorporate three consultation approaches. These are:

- Publication of this issues paper online, seeking written submissions from all interested parties.
- Targeted consultation by the Reviewer with key stakeholders.
- Convening of a high-level reference group, to provide advice to the Reviewer on technical matters and reform proposals.

Written submissions are sought from all interested parties on any of the key issues that have been identified in this paper. In addition, you are invited to respond to the specific questions posed at the end of this paper.

Assessing the *Electrical Safety Act 2002*

The scope of the *Electrical Safety Act 2002* (Qld) (the Act) is necessarily extensive, as it underpins the entire electrical safety framework for Queensland.

In 2019, the industry roundtable process convened by the Electrical Safety Commissioner, Mr Greg Skyring, identified key priorities for reforming the Act. These proposals reflected both longstanding areas of interest for stakeholders, as well as new and emerging changes in the electrical safety landscape that had significant implications for the effectiveness and the relevance of the Act.

Ensuring the relevance and effectiveness of definitions

The core definitions in Division 4 of the Act determine what is encompassed by the duties and requirements of the electrical safety legislation in Queensland, and what is not.

In order for the Act to continue to achieve its purpose, the definitions need to be sufficiently broad to cover the full span of electrical work, equipment, electrical entities and processes that present an electrical risk. However, it is also important that the definitions do not extend unnecessarily into the regulation of entities, equipment and processes that do not present a legitimate electrical safety concern deserving of the government.

The issues outlined below concern the core definitions that are priorities for the Review to address:

- The scope of “electrical equipment” and the related definitions of “electrical installation” and “electrical work” considering technological changes over time (see “Future proofing” below).
- The scope of “serious electrical incident” and “dangerous electrical event” considering threshold issues of near misses and voltages involved, particularly considering technological changes over time.
- The potential benefit of examples of various terms that draw on technological changes over time and are therefore clearer to interpret and apply to the contemporary environment.

Ensuring the relevance and effectiveness of duties and requirements

The electrical duties and requirements in the Act underpin the standards across the entire electrical safety framework in Queensland. The Commissioner’s report identified concerns about the adequacy of these provisions.

The issues outlined below concern duties and requirements that it is proposed the Review will need to amend or expand to achieve the purposes of the Act:

- Ensuring that the objects and regulation-making powers of the Act are broad enough to encompass duties to ensure electrical safety in the contemporary environment.
- Ensuring existing duties, such as those of suppliers and importers, are of sufficient scope to ensure safety in the contemporary environment.

Aligning the Act with existing work health and safety legislation

The electrical safety laws in Queensland were originally drafted to align with the state's work health and safety legislation, to ensure consistency in the application of health and safety standards.

Over the last two decades, amendments have been made to harmonise the two legislative frameworks. However, the Commissioner's Report identified that there were aspects of the Act that could be better aligned with the *Work Health and Safety Act 2011* (Qld).

The issues outlined below concern provisions of the Act and Queensland's work health and safety legislative scheme that the Review will need to consider:

- Ensuring the clarity of the status and application of codes of practice.
- Aligning the provisions of the ES Act with Queensland's work health and safety legislative scheme under the work health and safety laws, whilst ensuring the highest common denominator for work health and safety is achieved.
- Ensuring clarity regarding reviewable decisions.

Future-proofing the Act for new and emerging energy technologies including renewable energy generation and storage devices

The rapid technological changes over the previous twenty years have changed the landscape of electricity generation, transmission and supply. New technologies and equipment in the workplace and community have had significant consequences for electrical work, while customer choice has increased in the generation and storage of energy (e.g. solar rooftop photovoltaic and battery systems).

As the Queensland Government and the public embrace the potential of these changes, it is vital that our electrical safety legislation can keep the pace so that safety standards stay relevant and effective. The ideal is always to have legal concepts with sufficient generality to allow them to encompass technological advancements that did not exist at the time the legislation was drafted. However, in the case of the Act it is proposed that the generality built into the law is reaching its limit, and that changes are needed for the legislation to adapt these standards to new circumstances and the changing electrical risks they bring.

The broad issue outlined below overlaps and encompasses several issues already highlighted above and allows scope for further, open-ended consideration of "future-proofing" the ES Act:

- Ensuring new technologies for generating, distributing and supplying electricity are captured within key definitions, reflected in the scope of "electrical work", and also reflected in key duties to ensure electrical safety.

Ensuring the ES Act is fit for purpose into the future also includes consideration of changes proposed to national mutual recognition of licenses, license renewal (continuing professional development and skills maintenance), and contractor qualifications (for both qualified technical persons and qualified business persons), to ensure such changes are addressed in relation to eligibility, currency, competency, compliance and disciplinary action.

Invitation for feedback

Mr Dick Williams and the Office of Industrial Relations invites written submissions from all interested parties and members of the community on the Issues Paper.

Stakeholders may respond to (but are not limited by) the following questions, related to each of the issues highlighted above:

11. If any, what changes should be made to the scope of "electrical equipment" and the related definitions of "electrical installation" and "electrical work" under the ES Act, considering technological changes over time?
12. If any, what changes should be made to the scope of "serious electrical incident" and "dangerous electrical event" considering threshold issues of near misses and voltages involved, particularly considering technological changes over time?
13. Is there benefit in adding examples of various terms that draw on technological changes over time and are therefore clearer to interpret and apply to the contemporary environment? If so, what examples should be included?
14. If any, what changes should be made to the objects and regulation-making powers of the ES Act to ensure they are broad enough to encompass duties to ensure electrical safety in the contemporary environment?
15. If any, what changes should be made to ensure existing duties, such as those of suppliers and importers, are off sufficient scope to ensure safety in the contemporary environment?
16. Is it necessary to made changes to ensure the clarity of the status and application of codes of practice? If so, how could this be achieved?
17. If any, what changes should be made to align the ES Act with the Work Health and Safety Act?
18. More broadly, if relevant, how should the ES Act be changed to ensure new technologies for generating, distributing and supplying electricity are captured within key definitions, reflected in the scope of "electrical work", and also reflected in key duties to ensure electrical safety?
19. What, if any, changes are required to improve electrical safety in relation to electrical worker and contractor licenses?
20. Are there any other changes that should be made to the ES Act that would improve electrical safety in Queensland?

How to make a submission

Written comments should be provided by 11.59pm, 18 April 2021. All submissions received by the due date will be considered.

Responses and submissions should be sent by email to esreviewer@oir.qld.gov.au

As this is a public consultation process, the Queensland Government is committed to openness in its considerations of public policy. For this reason, written comments and submissions may be published on the Office of Industrial Relations' website. Please mark clearly any comments or information you wish to be kept confidential.

Appendix 7: Schedule of the written submissions to the Review

#	Stakeholder	Date of submission
1	Anonymous	5/3/2021
2	Dean White	8/3/2021
3	Fred McCulloch	8/3/2021
4	Ben Sorrell	9/3/2021
5	Wade Ferricks	17/3/2021
6	Kevin Attridge	29/3/2021
7	Alan Grafton	30/3/2021
8	Robin Row	30/3/2021
9	Paul Gambley	5/4/2021
10	Kurt Alexander	6/4/2021
11	Anonymous	10/4/2021
12	Tim Stenner	13/4/2021
13	Justin Brown	13/4/2021
14	Stuart Burns	15/4/2021
15	Wayne Burns	15/4/2021
16	Consultative Committee for Work- Related Fatalities and Serious Incidents	15/4/2021
17	Michael Stephen	15/4/2021
18	Resources, Safety and Health Queensland	15/4/2021
19	ETU (Keith McKenzie)	15/4/2021
20	Jemena	15/4/2021
21	Anonymous	15/4/2021
22	Dan & Debra Kennedy	16/4/2021
23	Bundaberg Council (Lee Wieden)	16/4/2021
24	Matthew Giampiccolo (Simply Energy)	16/4/2021
25	Powerlink (Tony Niven)	16/4/2021
26	ES Boards and Committees	16/4/2021
27	Veronica Mauri	16/4/2021
28	NECA (Peter Lamont)	16/4/2021
29	Stanwell (James Oliver)	16/4/2021
30	Origin (Courtney Markham)	16/4/2021
31	Brian Halls	16/4/2021
32	Ai Group (James Thompson)	16/4/2021
33	APA Group (Allan Sterling)	16/4/2021
34	Plus ES (Helen Vassos)	16/4/2021
35	Origin (Xiaoda Xu)	18/4/2021
36	Qteq (Andrew Clemence)	18/4/2021
37	Andrew Cox (TMR)	18/4/2021
38	Andrew Clemence	18/4/2021
39	Voltex Power Engineers (Raul Barrera)	18/4/2021
40	Anonymous	18/4/2021
41	Essential Energy (Andrew Sangkuhl)	19/4/2021
42	ETU Updated (Keith McKenzie)	19/4/2021
43	ESQ (Tim Roberts)	19/4/2021
44	Aurizon (Ben Fountain)	19/4/2021
45	MEA (Malcolm Richards)	19/4/2021
46	ESQ updated (Tim Roberts)	20/4/2021
47	Australian Energy Council (David Markham)	20/4/2021

48	Energy Queensland (Charmain Martin)	21/04/2021
49	Queensland Rail (Rob Harvey)	21/04/2021
50	Clean Energy Council (Lucinda Tonge)	21/04/2021
51	Energy Queensland Submission summary	21/04/2021
52	AgForce (Cam Parker)	23/04/2021
53	Adam Strout	30/04/2021
54	Department of Energy and Public Works	30/04/2021
55	Queensland Farmers Federation (Dr Georgina Davis)	2/05/2021
56	National Fire Industry Association	3/08/2021
57	Clemente Capdevila	13/10/2021

Appendix 8: Working Group Membership list and meeting overviews

Work Health and Safety Working Group (WHS WG)

Organization	Representative's name
QCU and Stanwell	Jacqueline King (Chair)
ESO (Networks and Supply)	Stacey Ozolins
Reviewer	Dick Williams
NECA	Belinda Binnington
Affected Persons Committee	Dan Kennedy
Affected Persons Committee	Samantha Woods
ETU	Keith McKenzie
MEA	Matthew Duncan
ES Commissioner	Greg Skyring
Powerlink	Fiona Austin
Powerlink	Tony Niven
RSHQ	Neville Atkinson
Clean Energy Council	Michael Shaughnessy
Clean Energy Council	Robbie Nichols
ESO (Equipment Safety and Licensing)	Brian Richardson
Work and Electrical Safety Policy	John Alizzi / Tobias Reeves (Secretariat)

WHS WG Meeting 1 – 11 June 2021
Members were welcomed to the working group and the purpose of the group, to provide recommendations and advice to the Reviewer on WHS issues was noted by members. Members discussed in scope issues at a high level including primary of duty of care, enforceability codes of practice, industrial manslaughter, safety switches, de-energisation of ceiling spaces and PPE. The group noted key issues were often interrelated to definitions that were being considered as part of the review. The chair requested that papers were prepared on the following topics to inform discussions at the next meeting, a paper comparing *Work Health and Safety Act 2011* (**WHS Act**) and *Electrical Safety Act 2002* (**ES Act**) provisions and a paper on safety switches. The Chair also requested that representatives from the WHS Prosecutor's office were invited to present at a future meeting.

WHS WG Meeting 2- 5 July 2021
Members discussed the primary Duty of Care informed by the WHS and ES Act comparison and agreed to recommend that the Reviewer reflect the broadness of WHS Act s19 in ES Act s30, ensuring this broad approach does not minimize standards or replace duties in specific context (e.g. duties for peoples responsible for common areas of body corporates). The enforceability of codes of practice under the ES Act was discussed and members agreed to recommend that the review consider adopting similar wording to section 26A in the WHS Act in the ES Act. Health and Safety Representatives were discussed however further work was agreed out of session to consider this further.

WHS WG Meeting 3 - 19 July 2021
Members discussed safety switches and members provided general agreement on recommending a phased approach to increase mandatory safety switch requirements. Members discussed other issues including notification provisions and duty for worker without electrical licence and primary duty of care. The chair requested papers on the following to inform discussion at the next meeting: various ES Act and WHS Act provisions, reasonably practicable provisions, Electric shock, primary duty of care, working without an electrical licence, notifiable incidents and SWMS and risk assessment. The Chair noted representatives from the WHS Prosecutor's office would be presenting at the next meeting.

WHS WG Meeting 4- 2 August 2021
A representative from the WHS Prosecutor's office presented to the group on his work in the area to date. Members discussed the paper on notifiable incidents that compared triggers of incident notification in various legislation. Members discussed the paper on the duty for a worker without an electrical licence noting the definition of supervision was unclear. SWMS and risk assessment across WHS and ES legislation as also discussed. The Reviewer noted he was seeking to cherry pick the best provisions from the ES Regulation and was also drawn to elements of the WHS legislation.

WHS WG Meeting 5- 16 August 2021
A list of issues for discussion and note was circulated to members ahead of the meeting to inform discussion at the final WHS working group meeting. The Reviewer advised members in relation to de-energising in ceiling spaces he was looking to make a recommendation to make this mandatory in domestic dwellings. Members discussed safety switches and the Reviewer noted members comments in relation to generators and PV cells. Members discussed PPE with the Reviewer and noted the Reviewer's intention to make a recommendation in relation to PPE. The Reviewer noted his intention to make recommendations in relation to in scope issues including but not limited to observers and LVR kits, requirements of safety observer for electrical related tasks, testing and tagging, rural exemptions and requirement for safe access. Members were thanked for their contributions and it was noted the group would not meet again.

Manufacturers, Wholesalers and Retailers Working Group (Manufacturers WG)

Organization	Representative's name
ESO (Regulator)	Donna Heelan (co-Chair)
ESO (Networks and Supply)	Stacey Ozolins (co-Chair)
Reviewer	Dick Williams
NECA	Belinda Binnington
ETU	Scott Reitchman
NHP	Nick Thompson
MEA	Matthew Duncan
B&R Enclosures	John de Smet
BW Group	John Webb
Ai Group	James Thomson
Clean Energy Council	Michael Shaughnessy
Work and Electrical Safety Policy	Kirsty McLean (Secretariat)

Manufacturers WG Meeting 1- 18 May 2021

Nominated members were welcomed to the working group by co-Chairs Donna Heelan and A/Director, Supply and Networks, ESO. The purpose and scope of the working group was presented by the Chairs for noting by members. Issues raised by members included the ease of consumer access to items that can only be installed by licensed electrical workers, the ability to isolate power on PV Cells in the event of an incident or emergency and the strength of import design and manufacturing laws. The Chairs agreed to circulate a list of in-scope issues raised throughout the consultation process for discussion out of session for comment. The Chairs advised they would circulate comments and that this would inform discussion at future meetings.

Manufacturers WG Meeting 2 – 11 June 2021

A table was circulated out of session detailing the in-scope issues for the group's consideration. The table was circulated ahead of the meeting with feedback from members on each of the issues. The meeting consisted of discussion of each of the 8 issues. Members agreed not to provide advice to the Reviewer to implement provisions that only a licenced electrician can purchase electrical equipment from wholesalers, retailers and online. Members also agreed to make a recommendation to the Reviewer to consider provisions or regulatory actions that can increase the availability of information for the industry and consumers regarding electrical equipment and products to ensure adequate access to and understanding of product certification and safety in Australian conditions. Members engaged in discussion in relation to 6 other issues and requested a gap analysis of non-conforming electrical products considering the EESS, current electrical safety legislation and QBCC in addition to a list of proposed electrical articles that could trigger the collection of consumer details by wholesalers and retailers to inform consideration of the remaining issues.

Manufacturers WG Meeting 3- 23 July 2021

Members were provided with a gap analysis as requested from the previous meeting and a list of proposed electrical articles that could trigger the collection of purchaser details to inform consideration of remaining issues. Members discussed a potential list of electrical articles that could be provided to the Reviewer alongside a recommendation to implement provisions that require wholesalers and retailer to retain purchaser details for the sale of certain electrical articles. It was proposed purchaser information could be made available to the regulator for recalls, proactive audits and investigations of non-compliance and unlicensed work. Members agreed to make this a recommendation to the Reviewer noting the list of electrical articles may need to be refined further. Members agreed to recommend that the Reviewer enhance the scope of duties od suppliers of electrical equipment for electrical risk to align with the WHS Act to ensure as far as reasonably practicable the equipment is without risk. Members made one final recommendation to the review to strengthen requirements for importers and suppliers of electrical equipment to confirm they conform with the appropriate standard, regulation and are electrically safe prior to being available for sale. The working group was thanked for their contributions and it was noted the working group would not meet again as all in scope issues had been closed.

Appendix 9: ***Improving Electrical Safety in Queensland: A Report by the Commissioner for Electrical Safety***

Improving Electrical Safety in Queensland

A REPORT BY THE COMMISSIONER FOR ELECTRICAL SAFETY

Letter to the Honourable Grace Grace MP Minister for Education and Minister for Industrial Relations.

Attachment 1:

A Report by the Commissioner for Electrical Safety – Improving Electrical Safety in Queensland

Your reference: 19/396402, FILE27363, REC27364

The Honourable Grace Grace MP
Minister for Education and
Minister for Industrial Relations
Email: industrialrelations@ministerial.qld.gov.au

Dear Minister

I am pleased to present you with 'Improving Electrical Safety in Queensland – a report by the Commissioner for Electrical Safety', January 2020 (the Report).

In forming my recommendations for the Report, I have drawn on my experience as Chair of the Electrical Safety Board and Chair of the Electrical Licensing Committee, as well as my comprehensive discussions with industry throughout my tenure as Commissioner for Electrical Safety and as Chair of the Solar Farm Industry Roundtable (the Industry Roundtable).

The findings of the Supreme Court of Queensland against section 73A of the *Electrical Safety Regulation 2013* (Qld) highlights the significant changes in technology for electricity generation, supply and distribution and the challenge of ensuring our electrical safety laws keep pace with emerging technologies. Many of these changes simply were not able to be contemplated at the time the *Electrical Safety Act 2002* (Qld) (ES Act) was drafted almost 18 years ago. For this reason, I recommend the Queensland Government undertake a comprehensive review of the ES Act to ensure the electrical safety laws are contemporary and able to keep pace with new and emerging technologies as they arise into the future. In addition, I also recommend a number of other matters that should be explored as part of the review.

I continue to support the Queensland Government in its efforts to ensure safety on solar farms remains paramount as this important industry continues to grow. Accordingly, I recommend that unlicensed electrical workers can undertake locating, mounting and fixing of solar photovoltaic modules (solar panels) to an array or structure but only when under the direct supervision of a licensed electrical worker. In considering the most effective means of implementing this recommendation, I have further recommended the definition of 'electrical equipment' under the ES Act be amended to make it clear that both solar panels with the purpose of generating power collectively above extra low voltage (either grid connected or stand-alone), and individual battery cells connected to other cells with the purpose of storing and releasing power collectively above extra low voltage (either grid connected or stand-alone), are considered 'electrical equipment'.

There are polarised views on these recommendations, primarily due to the lack of agreement on the exact electrical safety risks present during mounting, locating and fixing of solar panels. While I have taken into account the various positions of Industry Roundtable members, it is my view that safety risks remain and need to be addressed.

To provide immediate certainty regarding the application of existing legislative requirements to solar farms and to ensure high safety standards for workers, I have also made a number of short term non-legislative recommendations. The Industry Roundtable is supportive of most of these recommendations, particularly the development of minimum training requirements for all workers on solar farms.

Attachment 1 provides a summary of the Industry Roundtable discussions on the draft recommendations from their 20 November 2019 meeting, with Attachment 2 providing the written comments received following this meeting.

I would like to express my appreciation to the stakeholders who contributed to the Industry Roundtable and note I considered all their views in developing the solar farm specific recommendations of my report.

I intend to continue using the Industry Roundtable as a reference point in the future and, following your acknowledgement of the enclosed Report, I seek to provide members with a copy of the Report and acknowledge their participation in this process. If you require further information or assistance, please contact me on (07) 3406 9884.

Yours sincerely

Gregory Skyring
Commissioner for Electrical Safety

Enc 3

Attachment 1:
A Report by the Commissioner for Electrical Safety – Improving Electrical Safety in Queensland

Attachment 2:
Feedback from Solar Farm Industry Roundtable members on report recommendations – Meeting #3 (20 November 2019)

Attachment 3:
Submissions from Solar Farm Industry Roundtable members. Post Meeting #3 (20 November 2019)

Improving Electrical Safety in Queensland

A REPORT BY THE COMMISSIONER FOR ELECTRICAL SAFETY

January 2020

Contents

Executive Summary

Over the last two decades, Australia's electricity markets have transitioned at a rapid pace. Demand for electricity is declining in some jurisdictions, households are installing solar photovoltaic (PV) modules and older, traditional large-scale electricity generation infrastructure is being replaced with new technologies such as solar and wind. Technology is fundamentally changing the nature of the electricity industry through options for consumer based generation and energy generation.
Rapid growth in the solar farm industry has resulted in new entrants to the Queensland electricity generation market 'learning on the go' in some circumstances, with a lack of awareness causing a failure to comply with existing electrical safety and work health and safety requirements. I acknowledge there has been robust discussion amongst industry regarding the precise nature and severity of risks surrounding the locating, mounting or fixing of solar panels and that a common view is not shared.

From 1 August 2017 the Electrical Safety Office (ESO) within the Office of Industrial Relations (OIR) conducted audits of large-scale solar farms. These audits uncovered real and significant safety risks for workers working with solar PV modules, including risks of electrical shock and fire. In response to these findings, in May 2019 the Queensland Government sought to provide clarity and guidance to industry through the introduction of a new section 73A into the Electrical Safety Regulation 2013 (Qld) (the ES Regulation). This new provision introduced new safety requirements for solar farms with respect to locating, mounting and fixing of solar PV modules.
Section 73A of the ES Regulation was found to be invalid by the Supreme Court of Queensland and subsequently by the Court of Appeal. However, this ruling was made on technical legal grounds and did not address the substantive safety matters that resulted in the introduction of section 73A.
To address these safety measures, on 23 July 2019 the Honourable Grace Grace MP, Minister for Education and Minister for Industrial Relations, requested I urgently convene an industry roundtable to discuss safety within the large-scale solar farm industry (the Industry Roundtable) and that I provide the Minister with my advice on ways in which electrical safety matters on solar farms can be addressed to ensure Queensland has the highest possible safety standards. Specifically, the Minister requested that I canvass the following themes in providing my advice:

1. *clarity around existing legislative provisions and safety standards;*
2. *options for legislative amendment to create certainty and to ensure the definitions under the Electrical Safety Act 2002 (Qld) (the ES Act) keep pace with the fast growing solar farm industry; and*
3. *matters that need to be addressed in a longer-term review of the ES Act.*

Under section 71(d) of the ES Act, one of my functions is 'to advise the Minister on electrical safety matters generally' and in forming my advice to the Minister and developing recommendations to improve electrical safety in Queensland, I have drawn on experience from my role as Chair of the Electrical Safety Board (ESB) and Chair of the Electrical Licensing Committee (ELC), as well as my comprehensive discussions with industry throughout my tenure as Commissioner for Electrical Safety. The views of the Industry Roundtable were considered in my development of recommendations specific to the large-scale solar farm industry. Information on the conduct of the Industry Roundtable can be found in **Appendix 1**.
It is my view that significant technological changes to electricity generation, supply and distribution were not able to be contemplated at the time the ES Act was drafted almost

18 years ago. The invalidity of section 73A has highlighted vulnerabilities in updating the electrical safety legislative framework through regulatory amendment, when more fundamental limitations need to be addressed holistically in the ES Act. For this reason, I recommend the Queensland Government undertake a review of the ES Act to clarify the objects and regulation-making power of the ES Act and to ensure Queensland's electrical safety legislative framework can keep pace with new and emerging technologies.

The circumstances surrounding the removal of section 73A from the statute book has created uncertainty and confusion about what is, and who can undertake, electrical work and other work at solar farms. This is concerning for both managing electrical safety risks and actively growing the renewable energy sector in Queensland. Consequently, this report recommends that during the construction and operation of solar farms:

- competent workers (i.e. unlicensed) can install array support structures for solar PV modules, including support structures that may provide an earth path as part of the approved earthing design (e.g. footings and steel support frames as part of civil and mechanical works);
- the mounting, fixing or locating of solar PV modules and arrays can be undertaken by competent workers (i.e. unlicensed) however they must be directly supervised by a competent licensed electrical worker; and
- all earth cabling and connections, and module cabling and connections, must be installed, inspected and tested by a competent licensed electrical worker.

This report further recommends the review of the ES Act should canvass changes to the definition of 'electrical equipment' to ensure these concepts are enshrined in legislation.

I acknowledge that consensus on this recommendation is unlikely. However, providing clear and immediate guidance to industry and workers is considered a desirable outcome in lieu of achieving agreement of stakeholders who hold diametrically different positions on this contentious policy issue.

Providing immediate certainty to industry with respect to the application of existing legislative requirements to solar farms is essential to ensuring high safety standards for workers and to support the industry to continue to grow and to yield meaningful and local employment opportunities for Queenslanders, especially in regional areas. As a result, this report recommends a number of short-term non-regulatory initiatives to ensure government can take immediate action to provide this certainty. These recommendations include:

- industry to develop a minimum training requirement for all workers on solar farms;
- the Minister for Education and Minister for Industrial Relations consider updating the *Construction and operation of solar farms Code of Practice 2019* to refer to these requirements once developed;
- the continuation of compliance and enforcement campaigns across the solar farm industry by the ESO and Workplace Health and Safety Queensland (WHSQ); and
- to promote industry accountability and responsibility, industry should ensure they inform members of ways to manage new and emerging electrical safety risks and lessons learnt from the findings of any regulatory compliance action.

In recognition of the growing renewable energy industry, and the Queensland Government's efforts to expand this sector and accelerate the economy towards a clean energy future, this report also recommends the ESO undertake a compliance and enforcement campaign for other solar installations and notes the government's commitment to develop a code of practice for the construction and operation of wind farms.

Finally, this report makes a number of recommendations that should be considered in the review of the ES Act. These recommendations have been informed by my work as the Commissioner for Electrical Safety and my observations of critical areas requiring electrical safety reform. Recommendations include providing greater safety switch coverage in Queensland, improving electrical safety for workers in residential roof spaces, and addressing the safety risks where electrical workers work near exposed live parts, as well as a range of other legislative areas that require review.

Recommendations by the Commissioner for Electrical Safety under section 71(d) of the Electrical Safety Act 2002

(Qld) Recommendation 1

In light of the recent court ruling regarding section 73A, the Queensland Government should undertake a review of the *Electrical Safety Act 2002* (Qld), including the objects of the Act and the regulation-making powers, to ensure it is fit for purpose and can keep pace with new and emerging technologies.

Part 2: Options for legislative amendment to definitions of the Electrical Safety Act 2002

(Qld) Recommendation 2

In relation to the mounting, fixing and locating of solar PV modules on solar farms it is recommended that:

- competent workers (i.e. unlicensed) can install array support structures for solar PV modules, including support structures that may provide an earth path as part of the approved earthing design (e.g. footings and steel support frames as part of civil and mechanical works);
- the mounting, fixing and locating of solar PV modules and arrays by competent workers (i.e. unlicensed) must be directly supervised by a competent licensed electrical worker; and
- all earth cabling and connections, and module cabling and connections, must be installed, inspected and tested by competent licensed electrical workers.

Consideration should be given to amending the *Electrical Safety Act 2002* (Qld) to give effect to this recommendation.

Recommendation 3

In undertaking the review of the *Electrical Safety Act 2002* (Qld), the following should be considered 'electrical equipment'

- individual solar PV modules designed to be connected to other solar PV modules with the purpose of generating power collectively above extra low voltage (either grid connected or stand-alone); and
- individual battery cells connected to other cells with the purpose of storing and releasing power collectively above extra low voltage (either grid connected or standalone).

Work undertaken to implement this recommendation should include:

- careful consideration and analysis of any unintended consequences on the broader industry and community;
- a review of all definitions under the Act (due to their interconnectedness) to ensure relevance and effectiveness; and
- future proofing the Act for other emerging renewable energy and energy storage devices.

Recommendation 4

Before 30 June 2020, industry should develop minimum training requirements for all workers (both licensed and unlicensed) and supervisory persons on solar farms to ensure they are competent in understanding electrical safety risks and what work they can perform, including what work should be done by, or under the supervision of, a licensed electrical worker.
The Minister for Education and Minister for Industrial Relations should consider amending the *Construction and operation of solar farms Code of Practice 2019* to refer to the minimum training requirements once developed.

Recommendation 5

The Electrical Safety Office and Workplace Health and Safety Queensland should continue their compliance and enforcement approach to solar farms and other solar installations.

Recommendation 6

The Electrical Safety Office and Workplace Health and Safety Queensland should continue their ongoing efforts to share the results of audit and compliance campaigns with industry through communication channels such as the eSafe newsletter. Additionally, to promote industry accountability and responsibility it is recommended that industry ensure they inform members of ways to manage new and emerging electrical safety risks and lessons learnt from the findings of any regulatory compliance action.

Recommendation 7

In developing a code of practice for the construction and operation of wind farms, the Queensland Government should undertake a gap analysis on the suitability of the current legislation and standards. The development of this code of practice should include consultation early in the process with relevant unions and industry associations.

Recommendation 8

The review of the *Electrical Safety Act 2002* (Qld) should also canvass issues not limited to solar farms, including

- amendments to strengthen the duties of suppliers and consumer protections;
- amendments to strengthen the effectiveness of provisions related to: rectifying defective work, inspectors' powers to enter residential premises, cancelling registration of an electrical equipment supplier and excluding unscrupulous individuals and companies from being granted new licences following disciplinary action;
- better alignment of provisions of the *Electrical Safety Act 2002* (Qld) with Queensland's work health and safety legislative scheme; and
- requirements for generating entities.

Recommendation 9

The review of the *Electrical Safety Act 2002* (Qld) should include a review of issues specific to the Electrical Safety Regulation 2013 (Qld) , including:

- new safety switch requirements as part of minimum housing standards for residential tenancies;

- mandating the de-energising of residential buildings before work can commence in their roof space; and
- options to address the risks of workers working near exposed live parts.

Part 1: Clarity around existing legislative provisions of the *Electrical Safety Act 2002* (Qld)

This part provides an overview of the Supreme Court of Queensland's finding of invalidity against section 73A of the ES Regulation 2013 (upheld by the Court of Appeal) and discusses how this ruling impacts on the regulation-making power of the ES Act and recommends a review of the ES Act.

1.1 Section 73A of the Electrical Safety Regulation 2013 (Qld)

The Electrical Safety (Solar Farms) Amendment Regulation 2019 commenced on 13 May 2019, amending the ES Regulation by inserting section 73A. Section 73A was introduced in response to the reports of unlicensed workers inadvertently performing electrical work during the mounting, locating, and fixing of solar PV modules.
The effect of section 73A was to require a licensed electrical worker to locate, mount, fix or remove 'PV modules' in place at a solar farm and require work on solar PV modules to comply with the wiring rules.
On application by Maryrorough Solar Pty Ltd, the Supreme Court of Queensland declared section 73A of the ES Regulation invalid. The Queensland Government appealed to the Court of Appeal, with a hearing held on 7 June 2019. On 25 June 2019, the Court of Appeal dismissed the appeal, meaning that section 73A remains invalid.
The Court of Appeal ruling was made on the basis of technical legal grounds surrounding the exercise of the regulation making power under the ES Act. These grounds included:

- the contents of section 73A were inconsistent with the detailed provisions of the ES Act pertaining to the scope of the electrical licensing scheme;
- section 73A involved a 'new step in policy' which cut across aspects of the ES Act by requiring a licence for work that is not electrical work; and
- section 73A was 'practically irreconcilable' with the effect of section 20(1) that such a licence only authorises the performance of 'electrical work'.

The judgement ultimately dismissed the appeal after finding that while, *'a solar farm may be designed to supply electricity that has been generated by a system of PV modules…s73A concerns only work on a PV module at that solar farm and a PV module generates electricity rather than supplies electricity.*"[1]

1.2 Implications of section 73A ruling

There is a clear need to provide clarity around the regulation-making power of the ES Act to ensure Government can continue to effectively respond to emerging technologies and related electrical safety risks.
Regulations, by nature, are typically used:

- to ensure efficient use of parliamentary time, particularly where legislation is too technical or detailed to be suitable for parliamentary consideration; • to deal with rapidly changing or uncertain situations; and
- to allow for swift action in the case of an emergency.

However, regulations must be within the scope of the Act under which they purport to be made. In other words, they must complement not supplement the authorising Act. This report considers that one of the most significant implications of the recent court

[1] *State of Queensland v Maryrorough Solar Pty Ltd [019] QCA 129*.

ruling on section 73A was that it found the regulation involved 'a new step in policy' and challenged the accepted use of regulation making powers under the ES Act.

1.3 Review of the Electrical Safety Act 2002 (Qld)

In terms of history, in February 2000, 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 (the Taskforce) to investigate and make recommendations on the manner in which electrical incidents can be prevented, investigated and dealt with. The Taskforce reported in April 2001 and recommended standalone electrical safety legislation as a matter of urgency, based on the *Workplace Health and Safety Act 1995* (Qld) and complementary to other safety legislation.

The resulting ES Act was a key component of the Queensland Government's reform package to address Queensland's poor electrical safety record and respond to criticism from the Queensland Ombudsman and independent reviewers. The explanatory memorandum accompanying the Electrical Safety Bill 2002 identifies the purpose of the ES Act as, "to provide a comprehensive framework for electrical safety in Queensland homes and workplaces and to reduce the human cost to individuals and families in the community caused by death and injury". A review of the record of proceedings for the Queensland Parliament Scrutiny of Legislation Committee from this time identifies the provisions intended to achieve this were, "basically a contemporary version of regulatory provisions which have long been incorporated in statute".

Since 2002, energy technology and Australia's electricity markets have transitioned at a rapid pace. Demand for electricity is declining in some jurisdictions as households are installing solar PV modules and older, traditional large-scale electricity generation infrastructure is being replaced with new technologies such as solar and wind. Technology is fundamentally changing the nature of the electricity industry through options for consumer-based generation and energy generation. For example, currently in the electricity sector hydrogen is emerging as a storage mechanism for large amounts of energy due to the opportunity for it to contribute to the resilience of electricity systems. The 'contemporary regulatory provisions' contemplated at the time of inception of the ES Act appear to have become outdated with the changing landscape of the electrical industry.

This report notes the recent attempt to utilise regulations to legislate for technological changes has revealed the complex and interrelated nature of various provisions of the ES Act and ES Regulation.

The failure of section 73A to withstand legal challenge highlights the danger of pursing regulatory amendments to address fundamental limitations in legislation. For this reason, this report considers a review of the ES Act should be undertaken. This should include a thorough investigation of the regulation-making powers of the ES Act to ensure government is able to respond to emerging issues. Ideally, a single review of the ES Act, rather than legislating in a staged response to individual issues, is recommended due to the interconnectedness of a number of key concepts underpinning the Act and to allow for unintended consequences to be given due consideration.

Further, this report submits the 'object' of the ES Act, or any piece of legislation, should by definition, provide a clear and simple statement which prescribes the fundamental principles on which the legislation is predicated. Other provisions in the ES Act should be able to be tested against these principles. The objects of the ES Act also help inform legislators who are contemplating amendments about the underpinning principles on

which the legislation is based. Accordingly, any review of the ES Act should include a review of its object to ensure it is fit for purpose.
Part 3 of this report provides further detail on other issues that should be considered as part of the review.

Recommendation 1

In light of the recent court ruling regarding section 73A, the Queensland Government should undertake a review of the Electrical Safety Act 2002 (Qld), including the objects of the Act and the regulation-making powers, to ensure it is fit for purpose and can keep pace with new and emerging technologies.

Part 2: Options for legislative amendment to definitions of the *Electrical Safety Act 2002* (Qld)

This part examines the current legislative environment for regulating electrical safety on largescale solar farms in Queensland, including an overview of the safety issues identified at these sites. It provides an assessment of the issues raised at the Industry Roundtable and, on balance, recommends that competent workers (i.e. unlicensed) can only perform work that amounts to locating, mounting and fixing of solar PV modules to an array or structure only when under the direct supervision of a competent licensed electrical worker. This part then recommends legislative amendment to achieve this and highlights a necessary analysis of any unintended consequences. This amendment should be canvassed in the review of the ES Act. Finally, this part recommends taking several short-term non-regulatory actions to provide immediate certainty about work requirements on solar farms. These recommendations are intended to ensure high safety standards for workers and the industry.

2.1 Electrical safety issues at large-scale solar farms

WHSQ and the ESO closely monitor the development and construction of solar farms in Queensland. In fact, data collected by these agencies during audits of solar farms over the last twelve months indicates over 100 statutory notices have been issued for breaches of work health and safety and electrical safety laws.[2] Examples of non-compliance includes unlicensed electrical work, use of non-conforming products and no safe systems of work.

There have been 25 reported incidents at solar farms involving electrical shock, electrical burns, fire or explosion, risk of injury from damage to solar PV modules from grass fires and severe storms.

Safety audits have also uncovered cases of unlicensed workers and contractors performing electrical work on solar farms. For example, in one case a principal contractor was forced to pay considerable rectification costs after an investigation by the ESO found that high voltage and low voltage supply cables installed by unlicensed workers did not meet safety standards. These audits have also concluded there is confusion within industry about when a licensed electrical worker is required to undertake work at solar farms.

This report considers that unsafe or incorrect installation of solar PV modules can create significant electrical safety risks such as electrocution, fire and system faults. These risks are amplified by the large scale of solar farm installations, the amount of energy generated and the potential for safety incidents to occur during the life of the solar farm due to incorrect earthing or installation of panels during construction.

2.2 Current application of *Electrical Safety Act 2002* (Qld) to large-scale solar *farms*

Currently, under the ES Act there are requirements for 'electrical work' that may apply to some work at solar farms. Specifically, electrical work is defined as:

- connecting electricity supply wiring to electrical equipment or disconnecting electricity supply wiring from electrical equipment; or

[2] This figure reflects statutory notices issued to large-scale solar farms across Queensland up to October 2019.

- manufacturing, constructing, installing, removing, adding, testing, replacing, repairing, altering or maintaining electrical equipment or an electrical installation.[3]

Generally, this definition will not apply to work on solar PV modules, as individually they do not meet the definition of 'electrical equipment', as they are not above the level of 'extra low voltage'. The Court of Appeal also held this view and noted that work on a solar PV module was not electrical work because, 'a PV module is not electrical equipment'.

2.3 Work requirements at large-scale solar farms

The Industry Roundtable acknowledged there is a clear gap in the electrical safety legislative framework as it pertains to locating, mounting, or fixing solar PV modules in place at a solar farm. There was consensus this generated confusion within industry about when a licensed electrical worker is required. However, views differed on what work can be performed by unlicensed workers on solar farms.

The ETU submitted:

> *"Solar panel are different to other pieces of electrical equipment. Unlike a light fitting, or switchboard, these solar panels are generating voltage as soon as they are exposed to sunlight. In fact, these PV Modules are generating power, rather than connected to supply. They are the supply.*
> *When a number of panels are connected the total voltage then becomes higher than the extra low voltage requirements. Hence when these panels, when installed, must be considered electrical equipment and installed by a licensed electrical worker.*
> *The Queensland Government cannot afford to have a Home Insulation Fatality due to unsafe work practices by unlicensed workers installing PV modules."* Accordingly, the ETU strongly recommended:

> *"A change to section 18 of the Act to ensure that when it comes to the installation of panels that this work be undertaken by a licensed electrical worker or by a unlicensed electrical worker who is directly assisting in accordance with section s18(2)g."*

Section 18(2)(g) of the ES Act allows for an unlicensed electrical worker assisting a licensed electrical worker to carry out electrical work, on electrical equipment under the direct supervision of the electrical worker, if the assistance does not involve physical contact with any energised electrical equipment. .

Master Electricians Australia (MEA) recommended:

> *"non-electrical workers should be able to undertake the mounting and fixing of solar panels provided there are safe systems of work and the worker is provided with appropriate training."*

The Clean Energy Council (CEC) recommended that:

> *"Solar PV panels are fully insulated (and in most cases, double insulated), extra-low voltage equipment…it would be practically impossible for a worker to suffer shocks or electrocution from handling an unconnected panel.*

[3] See section 18 *Electrical Safety Act 2002* (Qld).

The CEC position is that the task of mounting and fixing solar panels onto a frame is not electrical work. The task only becomes electrical work in the act of making the wiring connections between the extra-low voltage panels."

I note the views of the MEA and the CEC, however I recommend that solar PV modules designed to be connected to other modules with the purpose of generating power collectively above extra low voltage (either grid connected or stand-alone) should be considered 'electrical equipment' to ensure work that is electrical work or tasks related to electrical work are performed by licensed electrical workers or completed under the direct supervision of a licensed electrical worker.

It is further recommended that competent workers (i.e. unlicensed) should be able to install array support structures for solar PV modules, including support structures that may provide an earth path as part of the approved earthing design (e.g. footings, steel support frames). However, because of their unique nature, the mounting and fixing of solar modules to arrays must be supervised by a competent licensed electrical worker. Further, all earth cabling and connections, module cabling and connections, must be installed, inspected and tested by competent licensed electrical workers.

Consideration should be given to amending the ES Act to give effect to this recommendation. This view has been formed after a detailed consideration of the electrical safety incidents on large-scale solar farms. The fact that solar PV modules begin generating voltage as soon as they are exposed to sunlight has also been considered. To allow for situations where an unlicensed electrical worker may inadvertently perform wiring or earthing of solar PV modules ignores these very real and significant risks.

To ensure highest safety standards for Queensland, consideration should also be given to safe systems of work, risk assessments and isolation procedures and to ensuring the Lock Out Tag Out (LOTO) of solar modules occurs before module cabling installation and connection work commences. These matters could be considered in the development of minimum training requirements (please see recommendation four for further information on this proposal).

Recommendation 2

In relation to the mounting and fixing of solar PV modules on solar farms it is recommended that:

- *competent workers (i.e. unlicensed) can install array support structures for solar PV modules, including support structures that may provide an earth path as part of the approved earthing design (e.g. footings and steel support frames as part of civil and mechanical works);*
- *the mounting, fixing and locating of solar PV modules and arrays by competent workers (i.e. unlicensed) must be directly supervised by a competent licensed electrical worker; and*
- *all earth cabling and connections, and module cabling and connections, must be installed, inspected and tested by competent licensed electrical workers.*

Consideration should be given to amending the Electrical Safety Act 2002 (Qld) to give effect to this recommendation

licensed electrical worker, it is recommended the definition of 'electrical equipment' be amended. The MEA made a further recommendation in regard to amending the

definition of 'electrical work'. This electrical work proposal is discussed in point 2 below.

1. Amend definition of 'electrical equipment' as provided by the Electrical Safety Act 2002 (Qld)

During the conduct of the Industry Roundtable, the MEA and ETU shared a proposal in relation to amending the definition of 'electrical equipment' under the ES Act.
The proposal of the MEA and ETU was to insert:

> *"sub-section 14(1)(e) - an individual solar module connected to other modules with the purpose of generating power collectively above extra low voltage either grid connected or stand alone; and sub-section 14(1)(f) - an individual battery cell connected to other cells with the purpose of storing and releasing power collectively above extra low voltage either grid connected or stand alone."*

The Industry Roundtable noted that if this proposal was adopted definitions of terms such
'solar module', 'individual battery cell', 'grid connected' and 'stand-alone' would require more detailed consideration.
Additionally, it is noted that in June 2017 the Electrical Equipment Committee (EEC) recommended that the ESB review adding extra low voltage energy storage equipment into the definition of electrical equipment. The EEC considered this would, *"ensure that the installation of multiple battery cells, or the installation of battery systems is required to be done by licensed electricians and further by suitably qualified persons".* The EEC made this recommendation after reviewing evidence of safety issues with solar PV module systems, including fires to DC isolators and other installation issues.
This report considers that in effect proposed sub-section 14(1)(e) would result in individual solar PV modules being a form of electrical equipment. This would have the flow-on effect of clarifying and meaning that, for example, connecting or disconnecting supply wiring in solar farms would constitute "electrical work" (section 18(1)(a)), as well as installing the individual solar PV modules (section 18(1)(b)). These forms of work (i.e. connecting or disconnecting supply wiring) would require an electrical work licence, restricting work to these workers (and apprentices under supervision). Sub-section 14(1)(f) would have a similar practical result for work on large-scale batteries.
Note: Section 18(2)(g) of the ES Act allows for an unlicensed electrical worker to carry out work on electrical equipment under the direct supervision of the electrical worker, if the assistance does not involve physical contact with any energised electrical equipment – this would include locating, mounting and fixing of these solar PV modules).
It is acknowledged that limitations of this recommendation include:

- use of specific terms such as "solar module" and "battery" may not cover similar emerging forms of generation and storage (e.g. ultra-capacitors) when they arise into the future and may not 'future proof' the electrical safety legislation; and
- the suggested changes are not likely to capture other renewable energy technologies broadly;

Importantly, the consequence of this definitional change is that it would apply to installation of solar PV modules on domestic residences. Current industry practice for installation on domestic residences is that individual solar PV modules may be separately mounted in position beside another solar PV module, and a row of solar PV

modules may all be mounted, by a person who does not hold an electrical work license. However, a key requirement of the proposed recommendation is that work can only be undertaken under the direct supervision of a licensed electrical worker. This report considers the close geographical proximity of work undertaken on domestic installations lessens the unintended regulatory burden as current practice indicates that a licensed electrical worker is typically in the immediate vicinity to perform the connections and final safety checks.

I am aware businesses in this industry have previously raised concerns about the unintended consequences of any regulatory proposal to address safety risks at solar farms that incidentally applies to the rooftop installation of solar PV modules. This includes concerns over extra costs, job losses and impacts on business viability.

An unintended consequence of this recommendation is that it may also capture solar PV modules used by individuals for camping or used in the manufacturing of caravans. Implementation of this recommendation should also include detailed consideration of these impacts.

However, after balancing the unintended consequences of this proposal against the need to provide industry with certainty on this issue, it is recommend the Queensland Government amend the meaning of 'electrical equipment' to make clear that both individual solar PV modules designed to be connected to other solar PV modules with the purpose of generating power collectively above extra low voltage (either grid connected or stand-alone) and individual battery cells connected to other cells with the purpose of storing and releasing power collectively above extra low voltage (either grid connected or stand-alone) are considered 'electrical equipment'.

This report also acknowledges the ES Act provides for a number of other definitions beyond 'electrical work' and 'electrical equipment'. Given the rate of change in the area of energy technology, it is recommended the review of the ES Act include a review of all definitions under the ES Act to ensure they are relevant and effective.

Additionally, the CEC noted that while:

> *"there may be merit in such additions to the Act at some time in the future, we caution any haste in recommending or pursuing these changes until broad*
> *industry and public consultation has taken place"*

This report shares similar concerns and notes the need to ensure all affected stakeholders are aware of the impacts of proposed changes and, where possible, actions are taken to minimise or avoid unintended consequences. Consequently, it is recommended that implementation of this recommendation should occur as part of the review of the ES Act to ensure thorough consultation occurs.

Recommendation 3

In undertaking the review of the Electrical Safety Act 2002 (Qld), the following should be considered 'electrical equipment'

- *individual solar PV modules designed to be connected to other solar PV modules with the purpose of generating power collectively above extra low voltage (either grid connected or stand-alone); and*
- *individual battery cells connected to other cells with the purpose of storing and releasing power collectively above extra low voltage (either grid connected or standalone).*

Work undertaken to implement this recommendation should include:

- *careful consideration and evaluation of unintended consequences on the broader industry and community; and*
- *a review of all definitions under the Act to ensure relevance and effectiveness; and*
- *future proofing the Act for other emerging renewable energy and energy storage devices.*

2. Amend definition of 'electrical work' as provided by the Electrical Safety Act 2002 (Qld)

During discussions at the Industry Roundtable, the MEA further proposed additional amendments to section 18(2) of the ES Act to exclude certain work on solar farms and largescale batteries from the meaning of "electrical work", with the effect that a licensed electrical worker would largely not be required. This proposal of the MEA was to insert:

> *"a new section 18(2)(e) which would require all parts of the structure becoming part of the earthing section to be done under the supervision of, a licensed electrical worker; and a new section 18(2)(f) which would allow trade assistants to perform the mounting and fixing of panels to a structure but take no part in the wiring or connection. The employer would need to ensure a safe system of work is used and the people are appropriately trained. The earthing of the panels would need to be completed and confirmed by a licensed electrical worker and all electrical connections and supply wiring undertaken by a licensed electrical worker."*

Under this proposal, solar PV modules and large-scale batteries would be considered 'electrical equipment'. However, there may be significant unintended consequences surrounding the proposal due to the way 'mounting of electrical equipment' is treated under the ES Act. In effect, the proposal could apply to all circumstances involving the locating, mounting and fixing of electrical equipment.

This report considers the implications of the proposed definitional changes would create unacceptable outcomes for industry and create an unsustainable policy position for government. On balance, the adoption of this proposal is not recommended, however the definition of electrical work should be reviewed in general.

2.5 Short-term non-regulatory actions to improve safety standards

This report acknowledges the *Construction and operation of solar farms Code of Practice 2019* (the Code of Practice) successfully provides guidance to ensure safety at solar farms throughout their life. It achieves this through consolidating existing electrical and work health and safety requirements for solar farms, including information on how designers, constructors and operators can comply with their existing safety duties.

However, it is accepted that circumstances surrounding 73A may have generated industry confusion about regulatory requirements on solar farms. In this regard, it is considered the Code of Practice could be complemented through additional short-term non-regulatory actions to ensure continued high safety standards for workers.

In recognition of this, the Industry Roundtable supported developing minimum training requirement for all workers and supervisory persons on solar farms as a means of ensuring the mounting, locating and fixing of solar PV modules is undertaken by appropriately skilled and qualified workers and to manage electrical safety risks.
In discussing minimum training requirements, the majority of the Industry Roundtable agreed that mounting of solar PV modules could be done by competent workers (i.e. unlicensed) under the supervision of a licensed electrical worker.

The CEC supported:

> *"the development of a basic competency module to educate PV module installation workers of the key hazards, risks and controls associated with their tasks, and general risks associated with working on solar projects."*
> *Such a training module would provide workers with a basic foundation of knowledge and could be conducted prior to arriving at site or alternatively as part of a site induction process."*

This report supports the views of the Industry Roundtable and recommends industry should lead the development of minimum training requirements for all workers (both licensed and unlicensed) on solar farms. The minimum training requirements should clearly define what work trade assistants and non-trades can perform, including what work should be done by, or under the supervision of, a licensed electrical worker. The training requirements should also ensure the worker has a thorough understanding of electrical safety risks, with a specific emphasis on risks which are exacerbated by the nature of work on solar farms (i.e. latent electrical safety risk such as electrocution, fire and system faults due to incorrect installation or earthing during mounting of solar PV modules). Consideration should also be given to how this can be linked to existing site-specific inductions.

The ESO should assist industry in developing the minimum training requirements. The risk register developed by the Industry Roundtable Technical Subcommittee should be referred to in this process as it details risks associated with certain aspects of work and any current competencies required.

To provide consistency of safety training across the renewable industry, consideration should also be given to how minimum training requirements could be adapted to other industries, e.g. wind farms.

Industry should report back to the Commissioner for Electrical Safety by 30 June 2020.

The Minister for Education and Minister for Industrial Relations should also consider amending the Code of Practice to refer to this minimum training requirement once developed.

Recommendation 4

Before 30 June 2020, industry should develop minimum training requirements for all workers (both licensed and unlicensed) and supervisory persons on solar farms to ensure they are competent in understanding electrical safety risks and what work they can perform, including what work should be done by, or under the supervision of, a licensed electrical worker.
The Minister for Education and Minister for Industrial Relations should consider amending the Construction and operation of solar farms Code of Practice 2019 to refer to the minimum training requirements once developed.

The Industry Roundtable also noted the remote location of solar farms presents unique difficulties in ensuring compliance at these sites.

Evidence and data available to this report supports acting to enforce compliance where there are unmanaged risks and contraventions with high levels of culpability leaving workers and others exposed to the likelihood of serious injury or illness. In this regard, it is recommended that the ESO and WHSQ continue the ongoing compliance approach to solar farms in Queensland. The risk register developed by the Industry Routable Technical Subcommittee could also be used to inform future compliance audit campaigns as it identifies the risks involved and relevant control measures for aspects of work performed on solar farms. This report also notes there are significant worker, public and property safety risks posed by the large-scale installation of solar PV modules due to the amount of energy generated. In particular, the high voltage generated collectively by solar PV modules poses an increased potential for electrical shock or fire if a fault occurs from incorrect earthing or installation.

Consequently, the report recommends the ESO and WHSQ should undertake compliance campaigns and audits of other installations of solar PV modules to identify non-compliance and enforce safety standards. Compliance campaigns should be initiated on a risk-based approach that balances the growth of the industry with the potential for harm to workers, the public and property. For example, in September 2019, the ESO had identified over 70 large scale commercial rooftop installations had made an application to connect to the electricity network. The risks associated with commercial rooftop installations share some similarities with solar farms.

Recommendation 5

The Electrical Safety Office and Workplace Health and Safety Queensland should continue their compliance and enforcement approach to solar farms and other solar installations.

During the Industry Roundtable, some stakeholders indicated that had they been aware of electrical safety issues identified on solar farms, they would have acted to address these findings. This report considers that communicating safety audit findings and data to external stakeholders can assist in developing a cohesive industry response to electrical safety issues. The ESO and WHSQ should continue to share their audit and compliance results with industry associations.

This report acknowledges the current efforts of the ESO to provide news and practical information for workers and contractors in the electrical industry through the circulation of the eSafe Electrical Newsletter. For example, in September 2019 an eSafe article was published to advise industry of the outcomes of audits and investigations on solar farms. This is considered an effective means of sharing compliance results and this report recommends the ESO and WHSQ continue their efforts in this regard.

This report considers that Government, as a regulator, plays a vital role in ensuring the health and safety of Queenslanders by administering and enforcing legislation that is aimed at eliminating the death, injury and destruction that can be caused by electricity and which covers thousands of workers, businesses and organisations. However, there are significant opportunities for industry, particularly representative bodies, to work alongside government to continue to develop and maintain high standards of electrical safety.

To promote industry accountability and responsibility in this regard, it is recommended that at a minimum industry continue to educate and inform members on ways of managing new and emerging electrical safety risks. This should also include the findings of any regulatory compliance action shared by the department to help spread the message about lessons learnt and ways to minimise risks.

Recommendation 6

The Electrical Safety Office and Workplace Health and Safety Queensland should continue their ongoing efforts to share the results of audit and compliance campaigns with industry through communication channels such as the eSafe newsletter.
Additionally, to promote industry accountability and responsibility it is recommended that industry ensure they inform members of ways to manage new and emerging electrical safety risks and lessons learnt from the findings of any regulatory compliance action.

Construction of large-scale wind farms is increasing. **Appendix 2** provides an overview of current operational wind farms and planned wind farms as at June 2019.
Wind farm jobs involve high risk construction work, including risks associated with working at height, complex crane lifts, the interaction of people and plant, hazardous environmental conditions, remote work, electrical safety and confined spaces.
The current efforts of WHSQ and ESO to closely monitor the development and construction of wind farms in Queensland to ensure planning, construction, operation and maintenance is done safely are acknowledged.
This report notes the Queensland Government has committed to developing a separate code of practice for the safe construction and operation of wind farms.
During the development of this code of practice, a gap analysis should be undertaken to understand the suitability of the current legislation and standards to this industry. Consultation should occur early in the process with relevant unions and industry associations.

Recommendation 7

In developing a code of practice for the construction and operation of wind farms, the Queensland Government should undertake a gap analysis on the suitability of the current legislation and standards. The development of this code of practice should also include consultation early in the process with relevant unions and industry associations.

Part 3: Matters to be explored in long-term review of the *Electrical Safety Act 2002* (Qld)

This part recommends key issues that should be considered in the long-term review of the ES Act. The recommendations have been informed by my experiences as Chair of the ESB and Chair of the ELC, as well as my comprehensive consultation and contact with

industry throughout my tenure as Commissioner for Electrical Safety.
Recommendation 8

The review of the Electrical Safety Act 2002 (Qld) should also canvass issues not limited to solar farms, including

- *amendments to strengthen the duties of suppliers and consumer protections;*
- *amendments to strengthen the effectiveness of provisions related to: rectifying defective work, inspectors' powers to enter residential premises, cancelling registration of an electrical equipment supplier and excluding unscrupulous individuals and companies from being granted new licences following disciplinary action;*
- *better alignment of provisions of the Electrical Safety Act 2002 (Qld) with Queensland's work health and safety legislative scheme; and*
- *requirements for generating entities.*

This part also addresses areas requiring critical electrical safety reform which fall within the ambit of the ES Regulation. **Recommendation 9**

The review of the Electrical Safety Act 2002 (Qld) should include a review of issues specific to the Electrical Safety Regulation Qld (2013), including:

- *new safety switch requirements as part of minimum housing standards for residential tenancies;*
- *mandating the de-energising of residential buildings before work can commence in their roof space; and*
- *options to address the risks of workers working near exposed live parts.*

It is recommended that comprehensive industry consultation occur on all matters recommended in this part.

3.1 Stronger duties of suppliers and consumer protection

In Queensland, people involved in the supply chain of electrical equipment have duties to ensure equipment is electrically safe. The main hazards associated with electrical equipment include:

- contact with exposed live parts, which may cause electric shock and burns (for example, exposed leads or other electrical equipment coming into contact with metal surfaces, such as metal flooring or roofs);
- equipment faults, which may cause fires and cause electric shock injury; and
- fire or explosion, where electricity could be the source of ignition in a potentially flammable or explosive atmosphere.

Currently under the ES Act, duties around managing the electrical safety risks of electrical equipment for designers, manufacturers, importers, suppliers, and designers of electrical equipment are predominantly restricted to provision of information. An emerging area of concern for regulatory regimes both nationally and internationally is how to protect the community from safety hazards in the context of consumer law. The

tragic events surrounding the Grenfell Tower fire in the United Kingdom serve as a sobering reminder that responsibility in the safe use of products should be shared by all industry participants, including designers, manufacturers, importers and suppliers.
This report understands that concerns over product safety supplier duties have also been raised in the context of the Queensland Governments response to silicosis and the importing of engineered stone benchtops.
Strengthening duties of suppliers and consumers should be pursued as part of the ES Act review. Specifically, this report recommends:

- introducing an additional provision to the duty of suppliers, to require the product itself to be electrically safe;
- clarifying the scope of the term 'importer';
- investigation of an additional extra-territorial recall power for electrical equipment and consideration of who is best placed to exercise these powers (i.e. Minister or Regulator);
- expanding of recall orders to wider duty holders (e.g. suppliers and officers of a company);
- expansion of enforcement measures to enable the regulator to direct that unsafe electrical products be removed from display and sale; and
- expanding the jurisdiction of the ES Act to enable clearer duties to be imposed on markets which have a nexus with Queensland (i.e. online platforms).

3.2 Strengthening provisions related to powers of the regulator, persons appointed by the regulator and statutory bodies

During my tenure as Chair of the ESB and Chair of the ELC a number of provisions have been raised by stakeholders or have been identified through work of the board or committee, as areas requiring strengthening or review to ensure their effectiveness.

For example, there have been instances where an electrical contractor has been the subject of disciplinary action at the ELC for performing negligent and incompetent electrical work. The electrical contractor has subsequently gone into voluntary liquidation. However, the ESO have no capacity to refuse the granting of a new electrical contractors' licence to the sole director (i.e. phoenix activity). This is because under the current provisions of the ES Act, there are no grounds similar to a 'fit and proper person test', effectively allowing rogue contractors to hide behind 'the corporate veil'.

Accordingly, this report recommends the review of the ES Act, to encompass amongst other things, a review of the provisions relating to:

- directions to rectify defective work as there is a current gap in the legislation where licensed electrical workers and contractors can only be directed to rectify faulty work through conditions imposed by the ELC in a disciplinary proceeding;
- inspectors' powers to enter residential premises as it is currently unclear if inspectors can access residential premises (without warrant or consent) to examine a switchboard and assess if it is electrically safe;
- what circumstances cancelling the registration of an electrical equipment supplier extends to; and

- the capability of the ELC to address instances of individuals and companies engaging in 'phoenixing' activities through the introduction of a 'fit and proper person' test.

3.3 Aligning provisions of the Electrical Safety Act 2002 (Qld) with the work health and safety legislative framework

As noted earlier in this report, Queensland's electrical safety laws were originally templated on the work health and safety framework to ensure consistency in application. Over the last two decades, amendments have been made to harmonise the two legislative frameworks. For example, amendments to the ES Act in January 2014 adopted terms and concepts from the *Work Health and Safety Act 2011 (Qld)* (WHS Act). However, this report considers there are some aspects of the legislative framework that could be more closely harmonised. Specifically, these are:

- strengthening requirements for accredited auditors to hold and maintain appropriate insurance;
- including a new provision about the status and functions of codes of practice under the ES Act to align them with section 26A of the WHS Act which requires a PCBU to comply with an approved code of practice or another method that ensures safety to an equal or higher standard than the code;
- power of the regulator to grant an exemption from compliance with any provision of the ES Regulation;
- amending the ES Act to provide clarity over reviewable decisions including a table that sets out decisions that are reviewable (similar to schedule 2 of the WHS Act); and
- prescribing the powers and functions of the Work Health and Safety (WHS) Prosecutor in the ES Act as enshrining these provisions in legislation would cement the independence of the WHS Prosecutor in conducting and defending proceedings under the ES Act, rather than acting as a delegate of the regulator (as is currently the case). The report recommends the aforementioned issues, and any other matters identified by the department, should be considered in the review of the ES Act.

In addition, there are a number of miscellaneous administrative and technical matters that have arisen during the course of the department's enforcement of the ES Act, and my work as the Commissioner for Electrical Safety, that should also be considered as part of the review. These matters can be provided to the Minister for Education and Minister for Industrial Relations as required.

3.4 Requirements for generating entities

Currently in Queensland the electrical safety legislative framework places various specific requirements on electricity entities. However, generating entities appear to mainly have the overriding duty of an electricity entity to ensure its works are electrically safe and operated in a way that is electrically safe.

In recent years the transitioning energy market and development of new technologies has resulted in some businesses, or even households, generating electricity and using and storing it in the form of batteries, effectively becoming generating entities. This raises questions if new technology generation, for example solar and wind farms, are

adequately addressed by the ES Act in terms of ensuring high safety standards. For example, a generating entity is not a prescribed electricity entity and consequently does not have to have a safety management system in place.

This report considers that the linear concepts of the ES Act has created a gap in coverage in this respect. It is recommended that consideration should be given to whether the duties of electricity entities should be extended to encompass these situations, or if it would be more appropriate to develop separate tailored regulations.

3.5 Safety switches

Next to Western Australia, Queensland has the most comprehensive safety switch requirements in the country due to requirements of the Wiring Rules and the ES Regulation. For residential properties, safety switches are currently mandated on all circuits only when:

- a home is sold;
- a tenancy agreement is entered;
- electrical conductive ceiling insulation is to be installed; and
- a home is newly constructed or undergoes significant renovation (as at January 2019, via the commencement Wiring Rules amendments).

The ES Regulation requires that only licensed electricians perform electrical installation work on a home if a safety switch is installed as part of the work, which has cost implications for consumers. Requirements for commercial premises are similarly strict, but more technical in nature, depending on the amount of electrical current in certain circuits, environmental conditions and the type of electrical installation and work processes at the property.

This report notes that many stakeholders have called for greater safety switch coverage in Queensland. Potential responses to these calls include:

- a strict legal rule requiring safety switches on all residential and commercial circuits;
- further work to increase awareness and education on the benefits of safety switches; and
- payment plans and rebate scheme options to assist with the costs of installing safety switches and switchboards for vulnerable customers.

This report acknowledges the efforts of the Queensland Government in running public awareness campaigns to encourage homeowners to install safety switches on all circuits in recent years. However, there is clearly still a level of confusion amongst the community regarding safety switch requirements. It is considered that successful engagement of the community on this safety issue also requires promotion by industry. Effective ways of achieving this could include electricians making one on one contact with homeowners. This is just one example of ways industry can engage in promotion of electrical safety to protect the community.

The tragic fatalities that have occurred where safety switches have not been installed on all circuits are reminders of the importance of individuals checking that safety switches are installed on all electrical installations where possible. Consequently, this report considers that in the long-term safety switches on all circuits should be required. However, it is acknowledged that introduction of this requirement will require significant cost benefit balancing. I recognise the previous efforts of the department in

this regard and support a more rigorous and extensive consultation on this matter before any regulatory amendments are introduced.
In the short term, this report recommends the Queensland Government should consider enhancing safety switch requirements on rental properties to ensure vulnerable members of the community are protected.

3.6 Roof spaces

Four young people lost their lives while installing insulation in roof spaces under the Federal Government's Home Insulation Program, with three of these deaths occurring in Queensland in 2009–2010. In all three Queensland cases, the roof space of the residential property was not de-energised prior to undertaking work.
This report acknowledges this is a significant electrical safety issue and requires policy reform. The advocacy of some stakeholders regarding the application of this proposal to commercial roof spaces is also noted. However, requiring the full gamut of commercial roof spaces to be de-energised prior to work being undertaken in the space is significantly more complex and problematic than for residential roof space.
Electrical installations within commercial premises can be complex due to the size and layout of the electrical switchboards and equipment. A large commercial installation can contain multiple switchboards and isolation points. Even if isolation is performed, there may still be electrical cables in one part of the ceiling space being energised due to originating from another switchboard. Domestic or residential premises are a much simpler layout, so a process of isolation at the switchboard can be simple and highly effective in a domestic installation.
Further complications for commercial premises include that:

- de-energisation of a residential roof space is unlikely to be required for extended time periods and would result in minor inconveniences for any residents in the home. In contrast, requiring de-energisation of an entire roof space in a commercial building could have major impacts; and
- due to the varied nature of commercial premises, not all installations can have their electricity turned off. This would include such commercial installations such as hospitals, 24-hour manufacturing plants and major hazard facilities. De-energising a roof space in a shopping centre may result in lost business revenue, spoilt goods and food safety implications, and loss of important services (e.g. banking and electronic teller services).

In this regard, the report considers the de-energisation of commercial roof spaces prior to work being undertaken is not practical.
This report understands the department has previously undertaken industry consultation to introduce regulations to increase electrical safety in residential roof spaces. It is noted this proposal was likely stymied by the results of the court ruling on section 73A and subsequent implications.
This report considers that requiring the de-energising of residential building before work can commence in their roof space would effectively increase protections for workers with lower levels of electrical safety awareness (e.g. domestic pest inspectors and insultation installers) and would be consistent with other national approaches to this electrical safety issue. Consequently, this report recommends the Queensland Government should investigate ways to mandate the de-energisation of residential buildings before work can commence in their roof space. Further consultation on this issue should occur.

3.7 Working near exposed live parts

Arc flash incidents are avoidable but continue to happen regularly in Queensland. For example, since 1 January 2019 there have been eight arc flash-related serious electrical incidents. This include one instance where an electrical worker received burns to his hand, neck and face from an arc flash while he was terminating cables running to a switchboard.

The dangers of working near exposed live parts also include electric shock and damage to property. The purpose of the ES Act is to prevent people from being killed or injured and property from being destroyed or damaged by electricity. It is therefore recommended the Queensland Government explore avenues to address the safety risks presented by working near exposed live parts.

This report acknowledges that possible options to address this electrical safety risk have previously been considered. These include:

- further education and awareness campaigns (recommended by the ESB);
- regulatory amendments to require the de-energisation of electrical installations when electrical workers work near the installations; and
- amendments to the definition of "electrical equipment" in the ES Act, section 14, to include a switchboard as a kind of "electrical equipment", as opposed to a kind of "electrical installation".

Recent reforms in Western Australia makes it an offence to carry out electrical work, or cause electrical work to be carried out, on or near an energised part of an electrical installation, subject to two exemptions. The first exemption concerns situations characterised by four conditions:

a. where there is "no reasonable alternative" to connect to a supply of electricity,
b. where a risk assessment has been carried out by a competent person,
c. where a safe work method statement has been prepared and followed, and
d. where personal protective equipment (PPE) is used as required.

The second exemption is for electrical work on the service apparatus of a major network operator. In addition, in Western Australia, it is also a mandatory requirement under legislation to comply with the *Code of Practice for Persons Working on or Near Energised Electrical Installations*. The majority of this code is dedicated to guidance on performing electrical work on or near energised electrical installations pursuant to the first exemption set out above. Appendix B to the Code also contains a useful decision-making flowchart for electrical workers to navigate the requirements of the amendments.

In light of these possible options, this report recommends the long term-review of the ES Act canvass these proposed options and consultation with industry be undertaken to determine the preferred mechanism for reform.

- equipment by regulation where used to form a low voltage supply.

Appendix 10: *EESS reform proposals raised with the Review*

EESS "corresponding law"

The EESS is intended to operate seamlessly across Australian jurisdictions by way of an up-to-date national register of in-scope electrical equipment. The cross-jurisdictional operation of the register occurs via the concept of a "corresponding law". Section 48F of the Act provides that a matter registered in the national register is taken to be registered under the Queensland Act, whether it was done for "this Act or a corresponding law". Consistently, if registration is cancelled under a "corresponding law", it is taken to be cancelled under the Queensland Act (s 48G). Currently, "corresponding law" is defined in s 48A to mean (underline added):

> a law of another State that provides for <u>the same, or substantially the same,</u> matter as—
> (a) this part or a regulation made for this part; or
> (b) a provision of this part or a regulation made for this part.

The ESO expressed concern with applying the concept "substantially the same" and seeks a gloss within the definition. Specifically, the ESO noted the elements that should be "substantially the same" are *certification*, *use of rules*, and *registration*. If another law does not contain these three essential elements of the Queensland scheme, they should not be considered "substantially the same" and therefore would not fall within the definition of a "corresponding law". Such a change would allow the EESS scheme to operate more effectively across borders.

In-scope electrical equipment

The central concept determining the scope of the EESS is the meaning of "in-scope electrical equipment", which is defined in section 48B as follows:

> (1) In-scope electrical equipment is low voltage electrical equipment that is designed, or marketed as suitable, for household, personal or similar use.
> (2) It is immaterial whether the low voltage electrical equipment is also designed or marketed to be used for commercial or industrial purposes.

The ESO raised with the review the equivalent definition under Victorian law and the desirability of adopting its approach in Queensland. Under Victoria's *Electrical Safety Act 1998* (Vic), s 50, "in-scope electrical equipment" is defined to mean:

> electrical equipment that—
> (a) operates at or within a prescribed voltage range; and
> (b) is designed or marketed as suitable for household, personal or similar use—
> but does not include electrical equipment of a type that is declared under section 53 not to be in-scope electrical equipment.

Both the Queensland and Victorian provisions are centred on equipment designed or marketed as suitable for household, person or similar use. However, the Victorian provision contains two distinct features that make it more flexible and therefore responsive to changing circumstances.

Firstly, rather than stipulating low voltage equipment as the relevant voltage captured, the Victorian legislation refers to a "prescribed voltage range". This enables adjustments to the relevant voltage over time and to adapt with changing technology. Secondly, the Victorian legislation adds the condition that equipment is caught only if it is not "declared under section 53 not to be in-scope electrical equipment". This element of the definition does not appear in the Queensland Act, and allows the Regulator to exempt certain equipment otherwise caught by sub-section (a). Overall, the Victorian provisions allow more flexibility to either include or exclude certain equipment to ensure the "in-scope" equipment is best adapted to the purpose of consumer protection.

Record keeping

The current EESS requirement for the Regulator to establish and maintain a register of in-scope electrical equipment includes requirements to register: (a) responsible suppliers, level 2 and 3 in-scope electrical equipment; and (b) information about certificates of conformity and other matters (s 48D(2)(a)-(b)). Due to the historical structure of the ESO's electronic database (since changed), sub-section 48D(3) requires matters (a) and (b) to be "kept separately".

The ESO advocated for the removal of this requirement given its lack of usefulness, and for the ongoing overhaul of the ESO's electronic database. The aim of streamlining section 48D to remove redundant requirements could be considered in conjunction with ongoing work to improve the ESO's database system.

Regulator's register

As part of the EESS framework, the Regulator is involved variously in the making of declaration, determinations and exemptions regarding in-scope electrical equipment. For example, for level 3 in-scope electrical equipment, a person may apply to the Regulator for a certificate of conformity. However, the Regulator may provide an *exemption* if another person has been granted a certificate of conformity for the same type of equipment or if it is otherwise not necessary (Regulations, s 154(4)).

Regarding these various functions, the ESO is anxious to ensure the Regulator has both the relevant powers in relation to them *and* is required to publish these matters on the EESS website. Leaving aside the technical matter of whether the necessary powers already exist in implicit form in the legislation, the powers could be explicated.

Recognised external certification schemes

Beyond the ability of the Regulator to certify types of in-scope electrical equipment, a person may apply to the regulator to externally certify equipment. If the Regulator decides to declare a scheme, the scheme becomes a "recognised external certification scheme" (RECS). In addition to granting (or refusing) a scheme, the Regulator may impose conditions on (ss 171-175) or cancel (ss 176-8) a declared scheme.

The ESO raised with the Review situations in which it is desirable to *suspend* a declared scheme while investigating matters that go to grounds for cancellation. Beyond this additional regulatory option, the ESO also raised the utility of options to respond to non-

compliance with conditions through explicit powers to sanction, suspend or cancel RECS registration.

Second-hand equipment

Within the EESS framework, special requirements apply to second-hand equipment. If a second-hand item is offered for sale, information to the effect that the item has not been tested for electrical safety is required to be given to the would-be purchaser (Regulations, s 186). Currently, "second-hand" is defined at section 122 as "… an item of the type that has previously been sold, other than by wholesale."

The ESO noted that by linking the definition of "second-hand" to selling "other than by wholesale" an unintended gap in the legislation has been created. Where one company sells to another company, outside of a wholesale agreement, this arguably means an item is "second-hand" even though it has not been purchased or used by a consumer. As such, the ESO requested the Review to consider amending the definition of "second-hand" to link it to sale to the public, or to the concept of being sold and *used*. This appears to be an unintended regulatory gap.

Certificates of suitability

Section 187 of the Regulations empowers the Regulator to establish a program for the issuing of certificates relating to the suitability of types of level 1 or 2 in-scope electrical equipment for connection to electricity supply. However, the ESO's position is that the relationship between certificates of suitability and external certifiers issuing certificates and the requirements that apply to external certifiers who are authorised to issue certificates of suitability lacks clarity. As such, the ESO advocated for a definition of "certificates of suitability" to clarify this matter. The Review is agreeable to recommending the addition of a definition to assist with clarity of application.

Responsible supplier terminology

The concept of a "responsible supplier" is central to the EESS. The term "responsible supplier" is defined at section 48A of the Act as follows:

> of in-scope electrical equipment, means—
> (a) a person who conducts a business or undertaking that manufactures the electrical equipment in, or imports the electrical equipment into, Australia; or
> (b) if New Zealand is a participating jurisdiction, a person who conducts a business or undertaking that manufactures the electrical equipment in, or imports the electrical equipment into, New Zealand.

The Regulations provide further, specific definitions by way of the terms "registered responsible supplier", "relevant responsible supplier" and "relevant person" (Regulations, s 122). The two definitions qualified by the term "relevant" are directed at place of residence or place of business. Currently, the definitions are focused on residences or businesses in Queensland.

The ESO raised with the review two matters for rectification. Firstly, in practice, a very large proportion of responsible suppliers do not reside in Queensland. They may, for example, reside and primary conduct business in Victoria, but also conduct business in

Queensland. Secondly, the four similar terms referred to have been suggested by the ESO to be potentially confusing and used inconsistently in the Regulations. Terminology could be clarified to the extent necessary, in consultation with the Office of the Queensland Parliamentary Counsel.

Standards for In-Scope Electrical Equipment

Sections 126-127 of the Regulations set out "relevant standard(s)" for different levels of in-scope electrical equipment. For level 1 in-scope electrical equipment, the relevant standard is a Standards Australia standard, if one exists, and otherwise the standard specified in the provision. This definition is specific and exhaustive. In contrast, for levels 2 and 3 in-scope electrical equipment, the relevant standard is one accepted by the Regulator or under a corresponding law.

The ESO suggested the Review considers, for all levels of in-scope electrical equipment, the ability for the Regulator to accept a particular standard, rather than a specific standard referenced in the Regulations, and therefore, flexibly respond to changes over time. This would include the ability to apply or apply parts of a standard (i.e. effectively "amend" an existing standard) to avoid the two extremes of being overly prescriptive or too vague. In both cases, the aim is to avoid impractical guidance.

ABN and IRD requirements

Registration as a "responsible supplier" of in-scope electrical equipment is provided for by section 128 of the Regulations. The eligibility criteria set out therein includes having "an ABN or an IRD" (s 129(2)(a)). The two acronyms are defined in sub-section 129(6) to mean:

> ***ABN*** (short for 'Australian Business Number') has the meaning given by the *A New Tax System (Australian Business Number) Act 1999* (Cwlth), section 41.
> ***IRD*** means a tax file number within the meaning of the *Income Tax Act 2007* (NZ), section YA1.

The ESO is of the view that merely holding an Australian Business Number (ABN) or an Inland Revenue Department (IRD) number does not sufficiently narrow the eligibility criteria for registration as a "responsible supplier". The ESO advocated for responsible suppliers to be *based in* Australia or New Zealand and pointed out that an ABN or IRD can be obtained without doing so. The ESO's central concern is the difficulty of taking legal action against an entity that has no real connection to Australia or New Zealand. The ESO noted that to rectify this, either section 128 could be amended, or the definition of "importer" could be considered for amendment. This matter could be considered further, in light of the diverse, modern importing arrangements between cross-jurisdictional businesses, along with any potential unintended consequences.

Sale of in-scope electrical equipment

Core to the regulation of in-scope electrical equipment is prohibitions on the sale of certain items. Sections 143 and 144 of the Regulations restrict the sale of levels 1, 2 and 3 in-scope electrical equipment. All levels require that:

- the responsible supplier is registered (ss 143(1)(a), 144(1)(a));

- the item meets the "relevant standard" for that type of equipment (ss 143(1)(b), 144(1)(b)); and
- the item is "electrically safe" (ss 143(1)(c), 144(1)(d)).

The ESO raised with the Review the relationship between the requirements to meet the "relevant standard" and to be "electrically safe". While both are presently required, in most cases one will ensure the other. That is, if a "relevant standard" is met, the item will be "electrically safe". However, the ESO noted that there may be anomalous circumstances in which electrical safety will not necessarily flow from meeting the "relevant standard". An example is ceiling fan light heaters that met the "relevant standard" but nevertheless lead to fires. In this situation, the distinction between meeting the "relevant standard" and being "electrically safe" is evident. The latter is a broader concept. To the ESO, the regulatory gap resulting from this observation is the ability of the Regulator to deem an item not to be "electrically safe" based on incidents that occur. This would assist with both raising awareness of electrical risks and take steps to discipline those who ignore them and continue to sell unsafe equipment. The Review appreciates the distinction raised by the ESO, as well as the desirability of a power to deem equipment not to be "electrically safe" in so far as it clarifies and bring an awareness to those items known to be unsafe.

Second-hand equipment and charities

Electrical safety standards concerning second-hand equipment have been considered above at (f). A further matter raised for clarification by the ESO is the application of second-hand equipment requirements to charities, or more broadly to non-profit organisations (defined in section 97 of the Regulations). At present, no distinction is made between charities and other retailers for the purpose of second-hand equipment requirements. Charities selling second-hand equipment as part of their fund-raising efforts must follow electrical safety laws and regulations, along with all other retailers. For example, when selling a used sewing machine at an "op shop", if the sewing machine has not been tested for electrical safety then the requirement to display a sign to that effect applies to charities (s 186). The ESO advocated for making the application of such regulations to charities explicit in the legislation to prevent misunderstanding. While the Review is of the opinion that the matter is one of communication and engagement by the ESO, it may assist such communication efforts for there to be a note in the legislation to the effect that the second-hand equipment requirements apply to non-profit organisations.

Level 3 electrical equipment

Levels of equipment under the EESS reflect different levels of complexity and risk. This correlates to levels of requirements prescribed by the EESS under the Regulations, with level 3 equipment attracting the most stringent requirements and level 1 requiring the least.

Section 146 covers the sale of relevant items *with* levels 1 or 2 in-scope electrical equipment. "Relevant item" is defined as "a plug, flexible supply cord or appliance connector, as defined in the defining standard." The intent of the provision is for equipment already registered (e.g. a washing machine) to not require registration of its connected parts (e.g. cord and plug). The ESO advocated for this approach to be applied

more broadly to include any level 2 or 3 equipment permanently connected to other equipment (see ss 123-4).

Certificate of conformity renewals

Currently, renewals for certificates of conformity are limited to circumstances in which no modifications have been made to the equipment and no changes have been made to the relevant standard. The ESO advocated for an exception to this general rule, where modified equipment has been tested and found to be electrically safe. This exception achieves the same aim of safety but also allows traceability of an item. In contrast, if equipment is modified and a new certificate of conformity is applied for, it will not be possible to trace the life of the equipment. Two separate entries will exist within the ESO database: one for the original equipment and one for the modified form of the equipment. The ESO have therefore raised the desirability of creating continuity to trace equipment within the Regulator's database, indicating compliance (or otherwise) over time, as well as relevant changes.

RECS scope

The recognised external certification scheme (RECS) is an arrangement for private entities to perform certification functions with the Regulator's approval. The scope of certification is defined as "types of in-scope electrical equipment" (s 167(2)(b)(ii)(B)). The ESO requested a simple amendment to this scope to clarify what already appears to be accepted interpretation – that "types" includes all types, namely levels 1, 2 and 3 in-scope electrical equipment.

Information from applicants

For RECS applications, section 167 of the Regulations states the application must be accompanied by a fee, evidence of relevant accreditation, a written agreement, and "other documents and information required by the regulator". Similar to many minor proposals raised by the ESO, further clarity is sought as to the meaning of this phrase. The Review is of the opinion that the apparent broadness of the terms is to be read down in light of the context to mean, effectively, "other documents and information required by the regulator *to assess the application*". The ESO pointed to section 235 of the Regulations as an example of a more specific provision. Concerning application for renewal of a person's appointment as an accreditor auditor, sub-section 235(2)(c) refers to the application being supported by "enough information to allow the regulator to decide the application". A similar approach to an amended sub-section 167(2)(b)(iv) could be adopted.

Public notice

Section 168 of the Regulations requires the Regulator to advertise an intention to grant a RECS application. Sub-section (4) provides the notice must be published in:

> (a) a newspaper circulating generally in the State; or
> (b) if the types of in-scope electrical equipment concerned would typically be sold only to a particular section of the public—a newspaper or other publication circulating generally to that section of the public; or

(c) if the types of in-scope electrical equipment concerned would typically be sold only in a particular part of the State—a newspaper or other publication circulating generally in that part.

The ESO requested the ability to use a website as a form of public notice of an intent to make a declaration. Given the changing nature of access to information, online publication appears to be an appropriate form of public notice.

Regulation scope

Section 180 of the Regulations provides that a RECS declaration holder (i.e. an external certifier) "must comply with the equipment safety rules" in certifying a type of level 3 in-scope electrical equipment. The ESO requested that this section be amended to refer to any levels of equipment: level 1, 2 or 3. If the declaration holder is considered qualified to certify the highest level of equipment (level 3), the Review sees no reason to object to certification of equipment that poses lower potential electrical safety risks (levels 1 and 2).

Penalty for failure to register

Sections 128(1) of the Regulations allows a person to register as a responsible supplier of in-scope electrical equipment. Particular registrations are required for the different levels of equipment (see ss 132(1) and 135(1)). The sale of in-scope electrical equipment is thereafter prohibited unless the retailer is a registered responsible supplier (for that type of equipment (ss 143-5). These prohibitions are each subject to a penalty of 40 penalty units. Regarding this framework, the ESO noted the need to commence litigation where the penalties are unpaid. The ESO advocated for a more streamlined approach via the ability to issue infringement notices for the failure to register as a responsible supplier if the person sells relevant electrical equipment. As with the recommendation above, the Review encourages consideration of this avenue and its consistent application with State Penalties Enforcement legislation.

Scope of declarations

Schedule 3 of the Regulations covers the topic of information to be included in declarations by responsible suppliers. The schedule contains three parts: Part 1 – Responsible supplier's declaration; Part 2 – Responsible supplier's level 2 in-scope electrical equipment declaration; and Part 3 – Responsible supplier's level 3 in-scope electrical equipment declaration. The contents of Schedule 3 are succinct. The ESO sought further particularity as of what responsible suppliers are to declare. This proposal could assist with the safe and effective administration of the RECS framework.