



COLORADO

**Department of
Regulatory Agencies**

Colorado Office of Policy, Research &
Regulatory Reform

2018 Sunset Review: State Electrical Board

October 15, 2018



COLORADO

Department of
Regulatory Agencies

Executive Director's Office

October 15, 2018

Members of the Colorado General Assembly
c/o the Office of Legislative Legal Services
State Capitol Building
Denver, Colorado 80203

Dear Members of the General Assembly:

The Colorado General Assembly established the sunset review process in 1976 as a way to analyze and evaluate regulatory programs and determine the least restrictive regulation consistent with the public interest. Since that time, Colorado's sunset process has gained national recognition and is routinely highlighted as a best practice as governments seek to streamline regulation and increase efficiencies.

Section 24-34-104(5)(a), Colorado Revised Statutes (C.R.S.), directs the Department of Regulatory Agencies to:

- Conduct an analysis of the performance of each division, board or agency or each function scheduled for termination; and
- Submit a report and supporting materials to the office of legislative legal services no later than October 15 of the year preceding the date established for termination.

The Colorado Office of Policy, Research and Regulatory Reform (COPRRR), located within my office, is responsible for fulfilling these statutory mandates. Accordingly, COPRRR has completed the evaluation of the State Electrical Board. I am pleased to submit this written report, which will be the basis for COPRRR's oral testimony before the 2019 legislative committee of reference.

The report discusses the question of whether there is a need for the regulation provided under Article 23 of Title 12, C.R.S. The report also discusses the effectiveness of the Division of Professions and Occupations in carrying out the intent of the statutes and makes recommendations for statutory changes in the event this regulatory program is continued by the General Assembly.

Sincerely,

Marguerite Salazar
Executive Director





COLORADO

Department of Regulatory Agencies

Colorado Office of Policy, Research &
Regulatory Reform

2018 Sunset Review State Electrical Board

SUMMARY

Why is it regulated?

The National Fire Protection Association reported that annually, from 2010-2014, there were more than 61,000 fires in the U.S. caused by electrical failure or malfunction. Sixty-nine percent of those electrical fires were a result of wiring and related equipment. The fires resulted in 420 civilian deaths, 1,370 civilian injuries, and \$1.4 billion in property damage.

How is it regulated?

The laws that govern electrical practice are contained in Article 23 of Title 12, Colorado Revised Statutes, (C.R.S.) (Act). The Act states that the State Electrical Board (Board), housed in the Division of Professions and Occupations, is to be engaged in licensing electricians, and the inspection of electrical installations where a local jurisdiction or a qualified state institution of higher education does not perform them. The National Electrical Code (Code) provides the basis for electrical training and installations in Colorado.

What is regulated?

Electricians and electrical contractors who install and repair electrical wiring and electrical systems in buildings and machines according to designs and codes are regulated by the Board. Installations are inspected by inspectors employed either by the Board or by a subdivision of state government.

Who is regulated?

There are nearly 30,000 people in Colorado employed at some level of the electrical profession as licensed practitioners, registered apprentices, and/or registered electrical contractors. To become one of approximately 15,000 licensed practitioners, including residential wiremen, journeymen electricians, or master electricians, one must demonstrate a combination of Code knowledge, through examination, and proven practical ability, through on-the-job electrical experience, both of which are based on the Code.

What does it cost?

The Board is cash-funded. During fiscal year 16-17, implementation of the Act cost \$4,569,600 and the Board employed 35.4 full-time equivalent (FTE) employees; 30 of the FTE were inspectors.

What disciplinary activity is there?

During fiscal year 16-17, there were 240 complaints filed with the Board and it took 81 disciplinary actions, including the revocation of 4 licenses.

KEY RECOMMENDATIONS

Continue the Board for 13 years, until 2032.

The need for electricity in modern society is obvious. Electricity powers the machines that make quality of life better. Because electricity is such an everyday component of life, some people fail to grasp the dangers to health and safety that can be associated with electricity. People can, and do, die from both electrocution and fire. There is extreme danger to the public when unqualified people install electrical wiring and some appliances. The Act is a critical and fundamental piece of public protection because it empowers regulators to ensure that only qualified people install and modify electrical systems. It also provides that electrical systems are to be inspected, ensuring that they have been installed to Code specifications.

Repeal the limitations on the fees local jurisdictions may charge.

Portions of the Act limit the fees that local jurisdictions may charge for permitting and inspection services. The limits appear to be arbitrary because they are tied to the state fees. The Board operates a cash funded program. A state cash funded program charges the costs of operations to those who use the program in the form of fees and must approximate the direct and indirect costs of program operations. Notwithstanding, the General Assembly and state regulators take no part in local government budgeting, are not aware of and do not play a part in the budgeting processes of municipal or county jurisdictions, and cannot assume that the economies of scale are similar to those of the Board.

METHODOLOGY

As part of this review, Colorado Office of Policy, Research and Regulatory Reform staff attended Board meetings; interviewed Division of Professions and Occupations staff, Board members, and the Board's counsel; interviewed officials with state and national professional associations and local jurisdictions; examined records; and reviewed Colorado statutes and rules.

MAJOR CONTACTS MADE DURING THIS REVIEW

Colorado Association of Home Builders
Colorado Chapter of the International Code Council
Colorado Counties Incorporated
Colorado Municipal League
Colorado Solar Industries Association
Division of Professions and Occupations
Independent Electrical Contractors-Rocky Mountain
International Association of Electrical Inspectors
International Brotherhood of Electrical Workers
Rocky Mountain National Electrical Contractors Association
University of Colorado Boulder-Facilities Management
Safebuilt

What is a Sunset Review?

A sunset review is a periodic assessment of state boards, programs, and functions to determine whether they should be continued by the legislature. Sunset reviews focus on creating the least restrictive form of regulation consistent with protecting the public. In formulating recommendations, sunset reviews consider the public's right to consistent, high quality professional or occupational services and the ability of businesses to exist and thrive in a competitive market, free from unnecessary regulation.

Sunset Reviews are prepared by:
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Background

Introduction

Enacted in 1976, Colorado's sunset law was the first of its kind in the United States. A sunset provision repeals all or part of a law after a specific date, unless the legislature affirmatively acts to extend it. During the sunset review process, the Colorado Office of Policy, Research and Regulatory Reform (COPRRR) within the Department of Regulatory Agencies (DORA) conducts a thorough evaluation of such programs based upon specific statutory criteria¹ and solicits diverse input from a broad spectrum of stakeholders including consumers, government agencies, public advocacy groups, and professional associations.

Sunset reviews are based on the following statutory criteria:

- Whether regulation by the agency is necessary to protect the public health, safety and welfare; whether the conditions which led to the initial regulation have changed; and whether other conditions have arisen which would warrant more, less or the same degree of regulation;
- If regulation is necessary, whether the existing statutes and regulations establish the least restrictive form of regulation consistent with the public interest, considering other available regulatory mechanisms and whether agency rules enhance the public interest and are within the scope of legislative intent;
- Whether the agency operates in the public interest and whether its operation is impeded or enhanced by existing statutes, rules, procedures and practices and any other circumstances, including budgetary, resource and personnel matters;
- Whether an analysis of agency operations indicates that the agency performs its statutory duties efficiently and effectively;
- Whether the composition of the agency's board or commission adequately represents the public interest and whether the agency encourages public participation in its decisions rather than participation only by the people it regulates;
- The economic impact of regulation and, if national economic information is not available, whether the agency stimulates or restricts competition;
- Whether complaint, investigation and disciplinary procedures adequately protect the public and whether final dispositions of complaints are in the public interest or self-serving to the profession;
- Whether the scope of practice of the regulated occupation contributes to the optimum utilization of personnel and whether entry requirements encourage affirmative action;

¹ Criteria may be found at § 24-34-104, C.R.S.

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- Whether the agency through its licensing or certification process imposes any disqualifications on applicants based on past criminal history and, if so, whether the disqualifications serve public safety or commercial or consumer protection interests. To assist in considering this factor, the analysis prepared pursuant to subparagraph (i) of paragraph (a) of subsection (8) of this section shall include data on the number of licenses or certifications that were denied, revoked, or suspended based on a disqualification and the basis for the disqualification; and
 - Whether administrative and statutory changes are necessary to improve agency operations to enhance the public interest.

Types of Regulation

Consistent, flexible, and fair regulatory oversight assures consumers, professionals and businesses an equitable playing field. All Coloradans share a long-term, common interest in a fair marketplace where consumers are protected. Regulation, if done appropriately, should protect consumers. If consumers are not better protected and competition is hindered, then regulation may not be the answer.

As regulatory programs relate to individual professionals, such programs typically entail the establishment of minimum standards for initial entry and continued participation in a given profession or occupation. This serves to protect the public from incompetent practitioners. Similarly, such programs provide a vehicle for limiting or removing from practice those practitioners deemed to have harmed the public.

From a practitioner perspective, regulation can lead to increased prestige and higher income. Accordingly, regulatory programs are often championed by those who will be the subject of regulation.

On the other hand, by erecting barriers to entry into a given profession or occupation, even when justified, regulation can serve to restrict the supply of practitioners. This not only limits consumer choice, but can also lead to an increase in the cost of services.

There are also several levels of regulation.

Licensure

Licensure is the most restrictive form of regulation, yet it provides the greatest level of public protection. Licensing programs typically involve the completion of a prescribed educational program (usually college level or higher) and the passage of an examination that is designed to measure a minimal level of competency. These types of programs usually entail title protection - only those individuals who are properly licensed may use a particular title(s) - and practice exclusivity - only those individuals

who are properly licensed may engage in the particular practice. While these requirements can be viewed as barriers to entry, they also afford the highest level of consumer protection in that they ensure that only those who are deemed competent may practice and the public is alerted to those who may practice by the title(s) used.

Certification

Certification programs offer a level of consumer protection similar to licensing programs, but the barriers to entry are generally lower. The required educational program may be more vocational in nature, but the required examination should still measure a minimal level of competency. Additionally, certification programs typically involve a non-governmental entity that establishes the training requirements and owns and administers the examination. State certification is made conditional upon the individual practitioner obtaining and maintaining the relevant private credential. These types of programs also usually entail title protection and practice exclusivity.

While the aforementioned requirements can still be viewed as barriers to entry, they afford a level of consumer protection that is lower than a licensing program. They ensure that only those who are deemed competent may practice and the public is alerted to those who may practice by the title(s) used.

Registration

Registration programs can serve to protect the public with minimal barriers to entry. A typical registration program involves an individual satisfying certain prescribed requirements - typically non-practice related items, such as insurance or the use of a disclosure form - and the state, in turn, placing that individual on the pertinent registry. These types of programs can entail title protection and practice exclusivity. Since the barriers to entry in registration programs are relatively low, registration programs are generally best suited to those professions and occupations where the risk of public harm is relatively low, but nevertheless present. In short, registration programs serve to notify the state of which individuals are engaging in the relevant practice and to notify the public of those who may practice by the title(s) used.

Title Protection

Finally, title protection programs represent one of the lowest levels of regulation. Only those who satisfy certain prescribed requirements may use the relevant prescribed title(s). Practitioners need not register or otherwise notify the state that they are engaging in the relevant practice, and practice exclusivity does not attach. In other words, anyone may engage in the particular practice, but only those who satisfy the prescribed requirements may use the enumerated title(s). This serves to indirectly ensure a minimal level of competency - depending upon the prescribed preconditions for use of the protected title(s) - and the public is alerted to the qualifications of those who may use the particular title(s).

Licensing, certification and registration programs also typically involve some kind of mechanism for removing individuals from practice when such individuals engage in enumerated proscribed activities. This is generally not the case with title protection programs.

Regulation of Businesses

Regulatory programs involving businesses are typically in place to enhance public safety, as with a salon or pharmacy. These programs also help to ensure financial solvency and reliability of continued service for consumers, such as with a public utility, a bank or an insurance company.

Activities can involve auditing of certain capital, bookkeeping and other recordkeeping requirements, such as filing quarterly financial statements with the regulator. Other programs may require onsite examinations of financial records, safety features or service records.

Although these programs are intended to enhance public protection and reliability of service for consumers, costs of compliance are a factor. These administrative costs, if too burdensome, may be passed on to consumers.

Sunset Process

Regulatory programs scheduled for sunset review receive a comprehensive analysis. The review includes a thorough dialogue with agency officials, representatives of the regulated profession and other stakeholders. Anyone can submit input on any upcoming sunrise or sunset review on COPRRR's website at: www.dora.colorado.gov/opr.

The functions of the State Electrical Board (Board) and the Division of Professions and Occupations (Division) as enumerated in Article 23 of Title 12, Colorado Revised Statutes (C.R.S.), shall terminate on July 1, 2019, unless continued by the General Assembly. During the year prior to this date, it is the duty of COPRRR to conduct an analysis and evaluation of the Board pursuant to section 24-34-104, C.R.S.

The purpose of this review is to determine whether the currently prescribed regulation should be continued and to evaluate the performance of the Board and Division staff. During this review, the Board must demonstrate that the program serves the public interest. COPRRR's findings and recommendations are submitted via this report to the Office of Legislative Legal Services.

Methodology

As part of this review, Colorado Office of Policy, Research and Regulatory Reform staff attended Board meetings; interviewed Division of Professions and Occupations staff, Board members, and the Board's counsel; interviewed officials with state and national professional associations and local jurisdictions; examined records; and reviewed Colorado statutes and rules.

Profile of the Profession

Electricians are tradespeople who install and repair electrical wiring and systems in buildings and machines according to designs and codes.

The National Electrical Code (Code) is the foundation of electrical regulation in several states including Colorado. The Board adopts the Code and uses it as the state electrical code. Once adopted, the Code becomes the basis for education, training, installations, and inspections, as well as any other technically-based regulation in the state. The most recently updated edition of the Code is the 2017 Code.²

The Code is developed by the nonprofit National Fire Prevention Association (NFPA) and is updated every three years. The process encourages public participation in the development and revision of standards. The four steps in the Code development process are:³

1. Public input
When the development process begins, public notice requests interested parties submit changes or additions. Once all suggested changes have been reviewed and voted on, a first draft is reviewed by a committee to ensure parts of the code do not contradict one-another.
2. Comment stage
Once a first draft is released for public comment any person can comment on it. Comments are reviewed and recommendations are voted on. After the vote, a second draft is posted for review by the public.
3. Technical session
The technical session facilitates discussion between members of the public and the NFPA. Once comments are heard, they are voted on by NFPA members.

² National Fire Prevention Association. *NEC adoption maps*. Retrieved January 31, 2018, from <https://www.nfpa.org/NEC/NEC-adoption-and-use/NEC-adoption-maps>

³ Atkore International. *The National Electrical Code Process Explained*. Retrieved February 1, 2018, from <http://www.atkore.com/industry-affairs/national-electrical-code-process-explained/>

4. Appeals and issuance

There is a final opportunity to change the Code prior to publication in the form of an appeal to the Standards Council. It must occur within 20 days of the technical session. The Standards Council hears arguments and decides whether to issue a standard as drafted or modify it.

After the new Code has been adopted by the NFPA, the Board reviews it and votes whether to adopt it as a new state code. Not all states adopt the newest version of the Code immediately when it comes out. If the Board approves the Code, it becomes the standard for approximately 15,000 licensed electrical workers, who execute more than 33,000 electrical installations annually in Colorado.

The Board is responsible for permitting and inspecting all electrical installations unless there is a local jurisdiction, which may include a qualified state institution of higher education, that has its own permitting and inspection authority. Electrical inspections ensure that the installations are completed according to the Code.

There are nearly 30,000 people in Colorado employed at some level of the electrical profession as licensed practitioners, registered apprentices, and/or registered electrical contractors. To become one of approximately 15,000 licensed practitioners, including residential wiremen, journeymen electricians, or master electricians, one must demonstrate a combination of Code knowledge, through examination, and proven practical ability, through on-the-job electrical experience, both of which are based on the Code. The Board determines the specific qualifications for licensure and enforces industry and statutory norms through the Division.

Legal Framework

Legal Summary

The laws that govern electrical practice are contained in Article 23 of Title 12, Colorado Revised Statutes, (C.R.S.) (Act). The Act states that the State Electrical Board (Board) is to be specifically involved in testing and licensing electricians, and the inspection of electrical installations where local jurisdictions do not perform them.⁴ However, even where there is a local inspection authority, the Board is responsible for inspecting installations in public schools.⁵

The Board is a Governor-appointed, Senate-approved, nine-member, Type 1 board. It is made up of four electricians, two who are master electricians that are also contractors and two who are either master or journeyman electricians who are not contractors; one member who represents electrical utilities which render service to the public; one county- or municipality-employed building official; one active general contractor; and two members of the public at large.⁶

The Board independently governs the profession in Colorado. Though the Board's functions and policies are administered and enforced by the Department of Regulatory Agencies' (DORA) Division of Professions and Occupations (Division),⁷ because it is a Type 1 board, statute grants it autonomy. Section 105 of Title 24, Article 1, Colorado Revised Statutes (C.R.S.), describes a Type 1 board as one that:

shall exercise its prescribed statutory powers, duties, and functions, including rule-making, regulation, licensing, and registration, the promulgation of rules, rates, regulations, and standards, and the rendering of findings, orders, and adjudications, independently of the head of the principal department.

The Act enumerates prescribed Board powers and duties, including:

- Meet at least annually;⁸
- Adopt a state electrical code using the National Electrical Code (Code) as the minimum standard,⁹ and allow or disallow exemptions to the Code;¹⁰
- Adopt rules and regulations to enforce the Act and the Code;¹¹
- Register apprentice electricians and qualified electrical contractors;¹²

⁴ § 12-23-100.2, C.R.S.

⁵ § 12-23-116(7), C.R.S.

⁶ §§ 12-23-102 and 12-23-103, C.R.S.

⁷ § 12-23-103, C.R.S.

⁸ § 12-23-104(1)(a), C.R.S.

⁹ § 12-23-104(2)(a), C.R.S.

¹⁰ § 12-23-104(2)(g), C.R.S.

¹¹ § 12-23-104(2)(a), C.R.S.

¹² § 12-23-104(2)(c), C.R.S.

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- License, through examination, endorsement, or reciprocity, master electricians, journeymen electricians, and residential wiremen;¹³
 - Establish fees for licenses, permits, and examinations;¹⁴
 - Conduct hearings according to the provisions of the Act;¹⁵ and
 - Establish inspection fees in accordance with Act specifications¹⁶ and inspect electrical installations for Code-compliance.¹⁷

Any staff, witness, consultant, or member of the Board, or complainant under the Act, is immune from civil and criminal liability, when acting in an official capacity and in good faith, on matters and concerns covered by the Act.¹⁸

Licensing

Prior to working as an electrician or referring to oneself as a master electrician, journeyman electrician, or residential wireman, one must be issued a license or a temporary permit by the Board.¹⁹ Practicing without a valid license is a Class 2 misdemeanor for the first offense, and a Class 6 felony for any subsequent offense.²⁰ A fee is charged for each examination and each license category.²¹ When working as an electrician, every person must carry a license, permit, or registration with them.²² No political subdivision of state government may require a separate examination, certification, or license beyond what is required by the Act. However, a local government may require a free-of-charge registration for a contractor practicing within its jurisdiction.²³

To test for a master electrician's license, a candidate must document:²⁴

- An electrical engineering degree from an accredited college or university and one year of construction-related electrical experience;
- An electrical trade school or community college degree and four years of practical experience in electrical work; or
- One year of practical experience in planning, laying out, supervising, and installing wiring, apparatus, or equipment for electrical light, heat, and power beyond the requirements for a journeymen's license.

¹³ §§ 12-23-104(2)(c), 12-23-104(2)(j), and 12-23-109, C.R.S.

¹⁴ § 12-23-112, C.R.S.

¹⁵ §§ 12-23-104(2)(d), 12-23-104(2)(e), and 12-23-104(2)(h), C.R.S.

¹⁶ § 12-23-117, C.R.S.

¹⁷ § 12-23-104(2)(f), C.R.S.

¹⁸ § 12-23-118.3, C.R.S.

¹⁹ §§ 12-23-105 and 12-23-107, C.R.S.

²⁰ § 12-23-119, C.R.S.

²¹ § 12-23-112, C.R.S.

²² 3 CCR 710-1 § 11.6, State Electrical Board Rules and Regulations.

²³ § 12-23-111(15), C.R.S.

²⁴ § 12-23-106(1), C.R.S.

To test for a journeyman electrician's license, a candidate must document:²⁵

- At least four years' apprenticeship or four years' practical experience in wiring for electrical apparatus and equipment for electric light, heat, and power;
 - Two years must be in commercial or industrial electrical work.
- At least 280 hours of training in safety, the Code and its applications, and any other training required by the Board.

A residential wireman candidate must document to the Board, two years of accredited training or two years practical experience wiring one-, two-, three-, and four-family dwellings.²⁶

The Act allows academic experience to substitute for the practical work experience requirements for both journeymen and residential wiremen candidates. A candidate with a degree in electrical engineering from an accredited college or university, or a graduate of an electrical trade school or community college must be credited with one year of practical experience toward the license requirements. The Board is also directed by the Act to credit substantially equivalent military training as a substitute for portions of the required practical work experience.²⁷

No master, journeyman, or residential wireman may have a license renewed or reinstated unless he or she has completed 24 continuing education hours since a license was last issued.²⁸

Electrical apprentices must be registered with the Board within 30 days of employment and the Board must be notified within 30 days of employment termination. An apprentice must work under the supervision of an electrical contractor and/or a licensed master electrician who is responsible for both Act- and Code-compliance by the apprentice. One licensed supervisor may not supervise more than three apprentices at any given time on the jobsite.²⁹

The Board will issue a temporary working permit to a person who has met the experience requirements to take the examination, at that level of licensure for which the applicant will test. The permit is not valid for more than 30 days but may be revoked at any time by the Board.³⁰

A license by endorsement is issued to an electrician licensed in another state with substantially equivalent licensing requirements, once the electrician proves he or she has met the Colorado requirements.³¹

²⁵ § 12-23-106(2)(a), C.R.S.

²⁶ § 12-23-106(3)(a), C.R.S.

²⁷ §§ 12-23-106(2)(b), and 106(3)(b), C.R.S.

²⁸ § 12-23-106(4)(d)(II), C.R.S.

²⁹ § 12-23-110.5, C.R.S.

³⁰ § 12-23-110, C.R.S.

³¹ § 12-23-109(1), C.R.S.

If a reciprocal agreement exists between Colorado and another state, a Colorado license will be issued to a license holder from the other state if he or she has a license in good standing.³²

LICENSE EXEMPTIONS

The Act includes several exemptions from the licensing requirements. Employees of electrical utilities, telephone, cable television, telegraph, and railroad entities are exempt from license requirements while carrying out work related to those businesses.³³ Property owners may perform electrical work on their own property or residence provided the work is permitted and inspected. However, no exemption applies to rental, lodging, or property intended for resale.³⁴ Employees of any firm or corporation may work on property owned, leased, or rented by the firm or corporation, if the work is permitted and inspected according to the provisions of the Act.³⁵ However, this exemption is not allowed if the firm or corporate-owned property is rented to another party, is used for long- or short-term lodging, or is open to the public.³⁶ Routine maintenance, repair, or alteration of existing facilities is exempt from the licensing, permitting and inspection provisions of the statute.³⁷

Inspections

As of January 1, 2019, state electrical inspectors must be licensed journeyman or master electricians³⁸ or, in some cases, have passed the residential wireman's examination³⁹ or hold a Board-approved national certification and have two years practical inspection experience.⁴⁰ Local governments and qualified state institutions of higher education may perform inspections within their jurisdictions, provided the inspectors possess the same qualifications as state inspectors and are registered with the Board.⁴¹

Regulated electrical work requires that a permit be issued by either the Board, through the electrical utility that provides service to the permit location, or a local building department, which may include a qualified state institution of higher education.⁴² The Board prescribed fee must be based on actual expenses.⁴³ Permits are generally issued for one year but may be issued for up to three years.⁴⁴ Local governments and qualified state institutions of higher education may not charge fees

³² § 12-23-109(2), C.R.S.

³³ § 12-23-111(1), C.R.S.

³⁴ § 12-23-111(2), C.R.S.

³⁵ § 12-23-111(3), C.R.S.

³⁶ § 12-23-111(4), C.R.S.

³⁷ § 12-23-111(6), C.R.S.

³⁸ § 12-23-115(1)(a)(I), C.R.S.

³⁹ § 12-23-115(1)(a)(I)(A), C.R.S.

⁴⁰ § 12-23-115(1)(a)(I)(B), C.R.S.

⁴¹ § 12-23-115(1)(b), C.R.S.

⁴² § 12-23-116(1), C.R.S.

⁴³ § 12-23-117(1), C.R.S.

⁴⁴ § 12-23-116(6), C.R.S.

in excess of 15 percent of those established by the State.⁴⁵ If any electrical installations begin prior to filing a permit application, then the Board's fee will be doubled.⁴⁶

State inspectors must make inspections within three days of an application for inspection.⁴⁷ If an inspector finds that the installation is noncompliant, then a notice of disapproval, including needed corrective actions, must be sent to both the Board and the contractor within two days.⁴⁸ If an inspector determines that the situation warrants, he or she can order that all electrical service be discontinued until a situation is corrected. Any applicant may appeal a disapproval notice to the Board and a hearing must be granted within seven days.⁴⁹

INSPECTION EXEMPTIONS

There are exemptions provided in the Act for installations performed under the exclusive control of electric utilities for generation, control, transformation, or distribution of electric energy⁵⁰ and all buildings and facilities inside a fenced generating station, substation, control center, or communication facility.⁵¹

Property used in, around, or in conjunction with any mine inspected pursuant to the Federal Mine Safety and Health Amendments Act of 1977 is not inspected or subject to the provisions of the Act.⁵²

Installations of systems that use the electricity supplied through the wiring from an inspected system are exempt. Examples include the installation of sound, communications, alarm, or computer systems.⁵³

Discipline

The Board may deny, suspend, revoke, or refuse to renew any license or registration issued or applied for under the provisions of the Act. It may also place a licensee or registrant on probation, or it may issue a letter of admonition or a written citation to a licensee, registrant, or applicant for licensure for a violation of the Act, including:⁵⁴

- Violating the Act, Board rules, any construction law enacted by a political subdivision, any labor law, any health law, any workers' compensation law, or any Colorado or federal tax law;
- Failing to adhere to occupational standards;

⁴⁵ § 12-23-117(2), C.R.S.

⁴⁶ § 12-23-117(3), C.R.S.

⁴⁷ §§ 12-23-116(2)(b), C.R.S.

⁴⁸ § 12-23-116(4), C.R.S.

⁴⁹ § 12-23-116(3), C.R.S.

⁵⁰ § 12-23-111(17)(a), C.R.S.

⁵¹ § 12-23-111(17)(b), C.R.S.

⁵² § 12-23-111(16), C.R.S.

⁵³ §§ 12-23-111(18-24), C.R.S.

⁵⁴ § 12-23-118(1), C.R.S.

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- Misrepresenting oneself to the Board or the public;
 - Failing to adequately supervise employees according to the Act;
 - Being subject to disciplinary action in another jurisdiction for an action which is also a violation of Colorado legal provisions; and
 - Pleading guilty or *nolo contendere* to, or being convicted of a felony.

If the Board issues a citation to a licensee, the licensee may request a negotiated settlement, conducted under Board rules, or an administrative hearing to appeal the citation.⁵⁵

The Board must adopt a uniform fining schedule to be used in conjunction with, and in addition to the aforementioned disciplinary actions. The Act stipulates that fines for first offenses are capped at \$1,000, second offenses are capped at \$2,000, and subsequent violations are capped at \$2,000 per day that a violation occurs.⁵⁶ Half of all fines collected under the Act are sent to the State Treasurer who credits the money to the General Fund and the Division sends the remaining funds to the local jurisdiction where the violation occurred.⁵⁷

If a license is revoked pursuant to the Act, the licensee may not apply for a new license for two years from the date of revocation.⁵⁸

All final actions and orders of the Board are subject to judicial review by the Court of Appeals.⁵⁹

Board Rules

Pursuant to section 104(2)(a), of the Act, the Board generates rules necessary for the Division to administer the Act. The rules delineate standards for installation, by adopting the Code. The Board rules also address the management of license applications and examinations, temporary work permits, and the enforcement and adjudication provisions written in the Act.

⁵⁵ § 12-23-118(4)(b), C.R.S.

⁵⁶ § 12-23-118(5), C.R.S.

⁵⁷ § 12-23-118(7)(a), C.R.S.

⁵⁸ § 12-23-118.1, C.R.S.

⁵⁹ § 12-23-120, C.R.S.

Program Description and Administration

The State Electrical Board (Board) is a Governor-appointed, Senate-approved, nine-member, Type 1 board. The Board is charged with the implementation of Article 23, of Title 12, Colorado Revised Statutes (C.R.S.) herein referred to as the “Act.” It is made up of four electricians, two who are master electricians that are also contractors and two who are either master or journeyman electricians who are not contractors; one member who represents electrical utilities which render service to the public; one county- or municipality-employed building official; one active general contractor; and two members from the public.⁶⁰ The Board adopts and uses the National Electrical Code (Code) as the state electrical standard for licensing and installation.

The Board meets every other month. All Board proceedings, with the exception of discussions with the Board’s counsel, are open to the public. The Colorado Attorney General’s office has determined disciplinary discussions to be a matter of attorney-client privilege and are held in a closed executive session. However, all actions taken by the Board must be taken in an open session.

Table 1 summarizes the costs of implementing the Act.

Table 1
Electrical Board
Fiscal Information⁶¹

Fiscal Year	Total Program Expenditure	FTE
12-13	\$4,131,955	35.6
13-14	\$4,234,034	34.6
14-15	\$4,314,414	34.6
15-16	\$4,690,823	34.6
16-17	\$4,569,600	35.4

The program is cash funded. Table 1 shows that program monetary and personnel expenditures did not vary much during the period examined for this sunset review.

⁶⁰ § 12-23-102, C.R.S.

⁶¹ FTE in Table 1 does not include staffing in the centralized offices of the Division. Centralized offices include the Director’s Office, Office of Investigations, Office of Expedited Settlement, Office of Examination Services, Office of Licensing, and Office of Support Services. However, the cost of those FTE is reflected in the Total Program Expenditures. The Board pays for those FTE through a cost allocation methodology developed by the Division of Professions and Occupations the Executive Director’s Office of DORA.

Of the roughly 35 full-time equivalent (FTE) employees utilized by the program annually, approximately 30 are allocated to inspector positions throughout Colorado and the remaining positions are allocated to the support staff. The FTE are allocated as follows:

Program Management II	0.45
Administrator V	0.70
Program Assistant I	1.00
Administrator IV	3.00
Administrative Assistant III	0.20
Administrator III	0.40
Technician III	0.55
Inspector III	29.30

The focus of regulation is in two areas: the licensing and registration of electrical tradespeople and contractors, and the permitting and inspecting of electrical installations. Though there is overlap in administering the concentrations, the majority of the nine-member Board’s time is spent on issues surrounding the licensing, registering, and/or disciplining of individual electricians and electrical contractors. Board staff, employed by the Division of Professions and Occupations (Division), expends the majority of its resources and time performing installation inspections.

Inspections

The Board is responsible for the inspection of electrical installations where a local jurisdiction or a qualified state institution of higher education does not perform them.⁶² However, even where there is a local inspection authority, the Board is responsible for inspecting installations in public schools.⁶³ Inspections ensure that the installations are made according to the Code. Table 2 enumerates the inspections performed by Division inspectors during the period under review.

Table 2
Electrical Inspections
Fiscal Years 12-13 through 16-17

Fiscal Year	Total
12-13	31,159
13-14	32,713
14-15	34,108
15-16	33,324
16-17	33,414

⁶² § 12-23-100.2, C.R.S.

⁶³ § 12-23-116(7), C.R.S.

Table 2 illustrates that construction has been increasing. The number of inspections conducted by the Board has increased moderately when measured as a percentage. The overall increase is 7.2 percent during the entire period examined. However, when considering the increase over the five-year time cohort as a raw number, annual inspections increase by 2,225 inspections, which is quite a large increase in workload over a short period of time.

Licensing

Application

An application for license or registration may be obtained on the Board website. Once completed, it must be sent to the Division's Office of Licensing with the application fee. Currently the fees for original licenses and renewals are as follows:

- Master electrician license - \$140
- Journeyman electrician license - \$120
- Residential wireman license - \$100
- Contractor registration - \$210

Additionally, the fee to register an apprentice is \$30 and is paid by the employing contractor.

The application and all supporting documentation is kept on file for one year from the date of receipt. If the application process is not completed during that year, all information is purged and a new application, fee, and required information must be submitted before a license is issued. The renewal of electrician licenses coincides with the adoption of a new Code, which occurs every third year. The next adoption will occur in 2020. If a license is issued within 120 days of the pending expiration date, it will be issued with the next expiration date, three years out.

Reinstatement of an expired license carries a slightly higher fee:

- Master electrician license - \$155
- Journeyman electrician license - \$135
- Residential wireman license - \$115
- Contractor registration - \$225

Examination

If an application is approved by the Board, a candidate for a license must contact the PSI testing agency to schedule an examination. The examination is multiple-choice and administered in English only. Questions are based on the current Code. Results are provided at the testing site. If a candidate fails, he or she may retake the

examination as many times as needed during the eligibility period. The cost of the initial examination is \$75 and there is a \$70 retest fee.⁶⁴

PSI offers electrician examinations at several sites throughout Colorado including: Centennial, Wheatridge, Fort Collins, Pueblo, Colorado Springs, Grand Junction, and Durango.

Endorsement and Reciprocal Licensing

ENDORSEMENT

An electrician licensed in another state may acquire a license through endorsement if the state where he or she is licensed has substantially equivalent requirements as Colorado for a license through examination.

In addition to an application and fee, applicants must submit a letter from the state that issued the license. The letter must:⁶⁵

- Verify that the applicant holds a comparable, state-issued license.
- Verify that the applicant's license was obtained by examination.
- Provide a list of the categories covered on the exam, which includes:
 - A breakdown of percentages for each category covered in the specific examination taken.
 - The edition (year) of the Code used for the examination.
- Provide a list of the experience requirements for the license, and verification that the requirements were met.

RECIPROCAL AGREEMENT

The Board participates in the National Electrical Reciprocal Alliance. Because of the agreement, Colorado has journeyman electrician reciprocal licensing agreements with the following states:

- Alaska
- Arkansas
- Idaho
- Iowa
- Maine
- Minnesota
- Montana
- Nebraska
- New Hampshire

⁶⁴ PSI. *Colorado State Electrical Board, Candidate Information Bulletin*. p.2. Retrieved February 27, 2018, from https://candidate.psiexams.com/bulletin/display_bulletin.jsp?ro=yes&actionname=83&bulletinid=558&bulletinurl=.pdf

⁶⁵ Department of Regulatory Agencies, *Electrical Board: Applications and Forms: Electrician Licensure by Endorsement*. Retrieved February 27, 2018, from https://www.colorado.gov/pacific/dora/Electrical_Applications

- New Mexico
- North Dakota
- Oklahoma
- South Dakota
- Utah
- Wyoming

If an electrician holds a license in a participating state, meets other administrative and experiential requirements, and has paid a fee, he or she can be issued a Colorado journeyman license.⁶⁶

Temporary Work Permit

If an applicant wishes to work as an electrician prior to obtaining a license, he or she must request a temporary work permit when applying for a license. Only one temporary work permit can be issued per applicant and only at the time of original application. Temporary work permits are good up to 30 days. If, for any reason, an applicant fails to qualify for licensing, the applicant must cease and desist from working at the level of licensure granted by the temporary permit until passing the appropriate exam. If the applicant is not licensed in another category and wishes to work, the applicant must register as an apprentice and work with supervision.⁶⁷

Licenses Issued

During the most recent fiscal year covered by this sunset review, fiscal year 16-17, the Board regulated 18,580 individual tradespeople and 3,649 electrical contractors. Table 3 lists the number of total individuals licensed during the period covering fiscal years 12-13 through 16-17.

**Table 3
Electrical Board Licenses
Fiscal Years 12-13 through 16-17**

Fiscal Year	Examination / Original	Endorsement	Renewal	Reinstatement	Active Licenses as of June 30th
12-13	650	114	0	292	17,551
13-14	823	176	0	146	18,682
14-15	927	154	13,173	841	16,009
15-16	944	142	0	293	17,233
16-17	1,004	190	0	157	18,580

Complete licensing data is included in Appendix A.

⁶⁶ Department of Regulatory Agencies, *Electrical Board: Applications and Forms: Electrician Licensure by Reciprocal Agreement*. Retrieved February 27, 2018, from https://www.colorado.gov/pacific/dora/Electrical_Applications

⁶⁷ 3 CCR 710-1 § 4.9. State Electrical Board Rules and Regulations.

Licenses renew every three years. While the number of newly licensed individuals has increased every year, the total number of active licenses tends to remain steady. For a licensee to renew, reinstate, or reactivate a license, he or she must complete 24 hours of approved continuing education per license cycle.⁶⁸

Complaints and Discipline

The Board is also charged with receiving and initiating complaints, reviewing complaints, and disciplining licensees when necessary. Table 4 shows the number of complaints considered by the Board for each licensure category during fiscal year 16-17, the most recent year examined for this sunset review.

Table 4
Complaints Reviewed by Board
Fiscal Year 16-17

Master Electrician	26
Journeyman Electrician	40
Residential Wireman	9
Apprentice	19
Electrical Contractor	57

Complete complaint and discipline data is included in Appendix B.

Comparing Tables 3 and 4 shows that a complaint was filed against only 0.8 percent of the licensees regulated by the Board.

⁶⁸ 3 CCR 710-1 § 11.3.4. State Electrical Board Rules and Regulations.

There are several violations for which a licensee may be cited. Table 5 lists the possible violations and the number of times a complaint was filed for the violation.

**Table 5
Nature of Complaints
Fiscal Years 12-13 through 16-17**

	FY12-13	FY13-14	FY14-15	FY15-16	FY16-17
Practicing without a license	49	58	266	73	57
Standard of practice	9	11	19	23	40
Scope of practice	0	0	0	0	0
Sexual misconduct	0	0	0	0	0
Substance abuse	0	0	0	0	0
Felony conviction	11	16	14	27	29
Continuing education	0	0	42	0	53
Failure to register/supervise an apprentice	79	34	19	24	37
Violation of Board Order	0	0	0	5	4
Permit violations	5	13	23	13	11
Deception or fraud in attempting to obtain a license	3	2	0	3	5
Employment of unlicensed personnel	4	4	4	3	2
False or misleading advertising	0	0	0	0	2
Providing false information to the Board/Failing to cooperate w/ Board investigation	0	0	0	0	0
Total	160	138	387	171	240

Table 5 shows that the highest number of complaints concern practicing as an electrical tradesperson without obtaining the proper credential. Also noteworthy, the total number of complaints involving standards of practice represent 9.3 percent of the total complaints. This indicates that a majority of complaints considered by the Board are more administrative in nature and do not have subject matter directly related to installation life-safety.

At times the Board needs more information than what is included in an initial complaint and response by the licensee. In those cases, the complaints are referred to the Division’s Office of Investigations (OI). Of the 151 total complaints received by the Board during fiscal year 16-17, five were sent to OI to obtain more information.

If the Board finds that there is merit to a complaint, prior to making a final decision it may enter into formal discussions with a licensee seeking a timelier resolution. This process, named the Expedited Settlement Process (ESP), is designed to come to an agreement rather than going to court over a licensing issue.

Table 6 shows the number of cases that went through ESP during the period examined for this sunset review.

Table 6
ESP Referrals and Results
Fiscal Years 12-13 through 16-17

Fiscal Year	Carried Over	Received	Investigated	Settled
12-13	9	23	28	18
13-14	11	46	44	34
14-15	11	91	83	80
15-16	19	20	62	58
16-17	7	61	52	51
Total	57	241	269	241

The “Carried Over” category lists the cases that were opened with ESP in a previous fiscal year but not settled prior to beginning of the next fiscal year. It should be noted that the total number of cases received during the reviewed period matches the total number of cases settled. While, the numbers do not match on a yearly basis, over a longer term, the process appears to provide the desired results by settling cases out of the courtroom.

Table 7 lists the actions taken against licensees during the period examined for this sunset review.

**Table 7
Board Final Actions
Fiscal Years 12-13 through 16-17**

Type of Action	FY 12-13	FY 13-14	FY 14-15	FY 15-16	FY 16-17
Revocations	2	9	3	8	4
Suspensions	0	0	0	1	0
Stipulations	24	43	44	51	37
Letters of Admonition	20	23	2	13	6
Other	34	30	49	34	26
TOTAL DISCIPLINARY ACTIONS	80	105	98	107	73
Dismiss	24	21	29	35	68
Letter of Concern	85	27	162	30	13
Total Dismissals	109	48	191	65	81

The “Other” category includes actions such as cease and desist orders, injunctions, and citations. It includes actions that did not result in a licensee losing his or her license, or being restricted to practicing under certain conditions. A confidential letter of concern is issued when the Board feels that a licensee did not violate the conditions of the license but there were issues that are of unease in a complaint that may require some non-mandated corrective action on the part of the licensee.

Fines

Among the penalties the Board may assess are fines for violations of the Act. Table 8 lists the total amount of fines collected by the Board during the fiscal years examined for this sunset review.

**Table 8
Fines Collected
Fiscal Years 12-13 through 16-17**

Fiscal Year	Total
12-13	\$7,906
13-14	\$7,177
14-15	\$19,038
15-16	\$17,278
16-17	\$8,538

Table 8 indicates that fines increased more than 150 percent in fiscal year 14-15 and stayed high the following year, fiscal year 15-16, before settling back down to levels close to where they were previously. This can be attributed to the fact that 2015 was

a license renewal year and licensees were audited to verify that they had completed the continued competency requirements that were in place at that time. Because many licensees had not completed the licensing requirements, fines were imposed. The system has since changed to require 24 hours of continuing education per renewal cycle.

Collateral Consequences – Criminal Convictions

Section 24-34-104(6)(b)(IX), C.R.S., requires the Colorado Office of Policy, Research and Regulatory Reform to determine whether the agency under review, through its licensing processes, imposes any disqualifications on applicants or registrants based on past criminal history, and if so, whether the disqualifications serve public safety or commercial or consumer protection interests.

Section 12-23-118(1)(g), C.R.S., reads that it is a violation to have a:

Conviction of or acceptance of a plea of guilty or nolo contendere by a court to a felony. In considering the disciplinary action, the Board shall be governed by the provisions of section 24-5-101, C.R.S.

Whenever there is an issue concerning a felony conviction, the Board examines and evaluates each case individually. Once it considers the evidence and the circumstances, it decides whether to issue a license and, if a license is issued, under what circumstances the licensee may operate. For example, it may issue a license but stipulate that an electrician may not be able to work in a residential setting or may never be able to work without direct supervision. Table 9 shows the number of original applications submitted by felons and the result of the application during the period covered by this sunset review.

**Table 9
Felony Applications
Fiscal Years 12-13 through 16-17**

Fiscal Year	12-13	13-14	14-15	15-16	16-17
Approved with a stipulation	5	6	8	18	14
Denied	1	1	0	0	0

Table 9 indicates that only two applications were denied and 51 were approved during the fiscal years examined. The Board did not report that any licenses were suspended or revoked due to felony convictions.

Analysis and Recommendations

Recommendation 1 – Continue the State Electrical Board and provisions related to qualified state institutions of higher education for 13 years, until 2032.

The National Fire Protection Association reported that annually from 2010-2014 there were more than 61,000 fires in the U.S. caused by electrical failure or malfunction. Sixty-nine percent of those electrical fires were as a result of wiring and related equipment. The fires resulted in 420 civilian deaths, 1,370 civilian injuries, and \$1.4 billion in property damage.⁶⁹

The National Electrical Code (Code) provides the basis for electrical installations. The chief reason for a jurisdiction to adopt any building code is to protect public health, safety and welfare concerning the construction and habitation of buildings. Article 23, of Title 12, Colorado Revised Statutes (C.R.S.), herein referred to as the “Act,” directs the State Electrical Board (Board) to adopt the Code as the state electrical code.⁷⁰ Professional licenses are renewed every three years to coincide with the release and adoption of the most current Code.⁷¹ The Code also serves as the minimum standards that may be employed by a local jurisdiction or a qualified state institution of higher education that has adopted a permitting and inspection program. The Act also mandates that the Board,

be specifically involved in the testing and licensing of electricians and shall provide for inspections of electrical installations where local inspection authorities are not providing such service to the standards required by [the Act].⁷²

The need for electricity in modern society is obvious. Electricity powers the machines that make quality of life better. While there are deep discussions on the best way to generate electricity, there are not many discussions that promote the elimination of electricity. Because electricity is such an everyday component of life, some people fail to grasp the dangers to health and safety that can be associated with electricity. People can, and do, die from both electrocution and fire, as was noted above.

The sunset review process is directed by 10 statutory criteria. The first criterion directs analysis to opine on whether the regulation is necessary to protect the public health, safety and welfare.

There is extreme danger to the public when unqualified people install electrical wiring and some appliances. The Act is a critical and fundamental piece of public

⁶⁹ NFPA. *Electrical Fires Fact Sheet*. Retrieved June 20, 2018, from <https://www.nfpa.org/-/media/Files/News-and-Research/Fire-statistics/Fact-sheets/ElectricalFactSheet.pdf>

⁷⁰ § 12-23-104(2)(a), C.R.S.

⁷¹ 3 CCR 710-1 § 11.1. State Electrical Board Rules and Regulations.

⁷² § 12-23-100.2, C.R.S.

protection because it empowers regulators to ensure that only qualified people install and modify electrical systems. It also provides that electrical systems are to be inspected, ensuring that they have been installed to Code specifications. These measures help ensure that the installations and modifications are done according to the best practices. Failure to continue the Act would likely result in a greater loss of life and property.

To reduce the likelihood of electricity-related fires, injuries, and deaths, the Board and provisions related to qualified state institutions of higher education should be continued for 13 years. Thirteen years may seem like a long period of time to continue a regulatory program, but this sunset report does not recommend any major changes to this program which would demand earlier scrutiny by the General Assembly. Therefore, the General Assembly should continue the Act for 13 years, until 2032.

Recommendation 2 – Repeal the limitations on the fees local jurisdictions may charge.

Portions of the Act limit the fees that local jurisdictions may charge for permitting and inspection services. Section 12-23-111(17)(a)(II), C.R.S., reads:

Load control devices for electrical hot water heaters that are owned, leased, or otherwise under the control of, and are operated by, an electric utility, and are on the load side of the single-family residential meter, if such equipment was installed by a registered electrical contractor. The contractor will notify appropriate local authorities that the work has been completed in order that an inspection may be made at the expense of the utility company. The applicable permit fee imposed by the local authorities shall not exceed ten dollars. [emphasis added]

Section 12-13-117(2), C.R.S., reads in part:

Because electrical inspections are matters of statewide concern, the maximum fees, established annually, chargeable for electrical inspections by any city, town, county, city and county, or qualified state institution of higher education shall not be more than fifteen percent above those provided for in this section, and no such local government or qualified state institution of higher education shall impose or collect any other fee or charge related to electrical inspections or permits...

There are problems with these provisions. Because the General Assembly is not privy to what the direct and indirect costs associated with implementing a local program may be, the limits appear to be arbitrary.

When the General Assembly enacts a regulatory program it typically authorizes it as a cash-funded program. A state cash-funded program charges the costs of operations to those who use the program in the form of fees. Authorizing statutes will often explicitly state that the fees set by the regulator must approximate the direct and indirect costs of program operations. Notwithstanding, the General Assembly and state regulators take no part in local government budgeting, are not aware of and do not play a part in the budgeting processes of municipal or county jurisdictions, and cannot assume that the economies of scale are similar to those of the Board. This last point is relevant because section 12-23-117(2), C.R.S., actually limits the fees to a percentage of the Board's fees.

Compounding the issue, because of the machinations of the state budgeting system, the Board was forced to lower its fees twice in recent years. Lowering the state fees forced some local jurisdictions to also lower fees. Local jurisdictions do not set their budgets based on state formulas and should not have to monitor state revenues when setting local fees for services.

For these reasons the General assembly should repeal the sections of the Act that limit the fees that local jurisdictions may charge.

Recommendation 3 – Clarify that cables and systems utilized for conveying power are not exempt in section 12-23-111(20), C.R.S., when they are part of a building's electrical system.

When the Act was adopted, communications systems for telephone, security systems, and data systems were largely separate from a building's electrical systems and exempted from the Act. They were separate, self-contained systems that connected to the electrical systems but were not part of the system. Now, these once separate systems may carry voltage and are hardwired into the electrical system. When the hardwiring occurs, these systems actually become part of a building's electrical system and are no longer a separate appliance. When that occurs, these systems should be under the jurisdiction of the Act and the Code. However, section 12-23-111(20), C.R.S., reads:

Nothing in [the Act] shall be construed to cover the installation, maintenance, repair, or alteration of communications systems, including telephone and telegraph systems not exempted as utilities in subsection (1) of this section, radio and television receiving and transmitting equipment and stations, and antenna systems other than community antenna television systems beyond the terminals of the controllers. Furthermore, the contractors performing any installation, maintenance, repair, or alteration under this exemption, or their employees, shall not be covered by the licensing requirements of [the Act].

The first sunset criterion asks analysis to evaluate whether conditions which led to initial regulation have changed. In this case conditions have changed that warrant a change in regulation. It should be clear that the exemption does not cover cables and systems that carry electrical current and are not solely used for communications when these systems are part of the electrical system.

To protect installers and consumers from harm, the General Assembly should clarify that cables and systems utilized for conveying power are not exempt in section 12-23-111(20), C.R.S., when they are part of a building's electrical system.

Recommendation 4 – Define “supervision” and “direct supervision” in the Act.

“Supervision” and “direct supervision” are both used in the Act but are not defined. In a general sense, most people understand that to supervise is to oversee. However, a subjective definition of a word or phrase is not ideal for those who must either follow or implement the law. Ambiguity in the law has led to problems.

The Act defines an apprentice as someone who works under the “direct supervision” of a master or journeyman electrician. However, that phrase is not used again in the Act, even in the portions which address the supervision of apprentices. This causes confusion with both regulators and the regulated community. Supervision can have several meanings as can “direct supervision” which speaks to an undefined amount of supervision.

Other state regulation has defined “direct supervision” as the supervisor being in the same physical building. An electrical installation may not take place in the building but on an unimproved work site. Given the nature of construction projects, the standard in the Act should be “being within the same physical address.” Moreover, to be consistent, the phrase, “direct supervision” should replace the unmodified word “supervision” in section 12-23-110.5, C.R.S. This is the section that addresses the supervision of apprentices and it is needed.

The Act also employs the word “supervision” multiple times. If the General Assembly adopts this recommendation, statute will define “direct supervision,” it should also define “supervision.”

The Business English definition of supervision in the *Cambridge Dictionary* defines supervision as managing a project and making sure that things are done correctly and according to the laws.⁷³ This definition works well for the purposes of the Act and should be adopted.

⁷³ Cambridge Dictionary. *Supervision*. Retrieved June 22, 2018, from <https://dictionary.cambridge.org/dictionary/english/supervision>

To eliminate ambiguity in interpreting the Act, the General Assembly should define “supervision” and “direct supervision.”

Recommendation 5 – Repeal the requirement that the Board notify an applicant that he or she is qualified to take a licensure examination.

The Board no longer develops and proctors licensure examinations. Professional examinations are provided by a vendor, PSI. The Board provides a handbook with information about how to schedule an examination, testing locations, fees, and other necessary information.

The Board no longer informs candidates that they are qualified to sit for the examination. Rather Division staff processes applications, then notifies the candidates whether they meet the standards necessary to obtain a license – one of those standards is having passed an examination. This change was made following an audit, to streamline the licensing process.

Therefore, the following change is necessary, in section 12-23-106(1)(b), C.R.S., to make the Act match Board practice:

The Board shall notify each applicant that the evidence submitted with the application is sufficient to qualify for licensure ~~the applicant to take the written examination~~ or that the evidence is insufficient and the application is rejected.

The General Assembly should repeal Board notification that an applicant is qualified to take a licensure examination.

Recommendation 6 - Direct that the Governor consider that at least one of the four seats on the Board allotted to master or journeyman electricians a should be to an electrician who works primary in the residential sector.

Residential electrical professionals are under-represented on the Board. The Act directs that the Governor appoint and the Senate confirm the nine-member Board which consists of:⁷⁴

- Two members that are electrical contractors who have masters’ licenses;
- Two members that are master or journeymen electricians who are not electrical contractors;
- One member who represents a private, municipal, or cooperative electric utility rendering electric service to the ultimate public;

⁷⁴ § 12-23-102(1), C.R.S.

-
- One member who is a building official from a political subdivision of the state performing electrical inspections;
 - One member who is a general contractor actively engaged in the building industry; and
 - Two members who are appointed from the public at large.

Both currently and typically, the four tradesperson representatives have little experience in the residential side of construction. Members usually come from the commercial segment of construction. This is the case even though the overwhelming majority of complaints, issues, and concerns that the Board considers involve the residential sector of the industry. In most circumstances, Board make-up is not a problem but on occasion it does become one.

One salient issue involves the Code requirements concerning the installation of Arc Fault Circuit Interrupter (AFCI) breakers. The Code requires that these be placed on certain specific circuits in homes. There is no such requirement in commercial or industrial installations. An AFCI is meant to detect wear or a break in wiring which may cause the current to arc from one spot to another. The arcing can be very dangerous and could ignite a fire.

A problem occurs when the AFCIs trip without an arc occurring. The incidents are known as nuisance tripping because there truly is no arc-related problem. Nuisance tripping can be caused by appliances such as refrigerators or an ignitor on a gas stove, technology devices such as flat-screen televisions, or other pieces of household equipment. Nuisance tripping can also occur when the physical capabilities of a Code-mandated electrical device or component are exceeded due to elevation, temperature, or humidity. This can cause a home owner, who has just remodeled a home or purchased a newly constructed home, undesired anguish and expense. It is not uncommon. In fact, one contractor alone reported that over a one-year period, he was forced to replace nearly 300 such breakers.

When issues such as this are presented to the Board, which has the ability to grant a variance to the Code, the issues may not be given due consideration because the Board lacks the experience in residential installations. Board members who work mainly in the commercial sector do not have the personal experience to grasp the gravity or scope of a problem that exists solely in residential installations. A solution to this and other related issues is to ensure that the residential sector is represented on the Board.

Because the majority of issues and complaints that the Board addresses concern the residential sector of the electrical trade, the General Assembly should direct that the Governor strongly consider at least one of the four seats allotted to master or journeyman electricians be an electrician who works primarily in the residential sector.

Recommendation 7 – Clarify that traffic signals are exempt from the Act.

Traffic signals are apparatuses that plug into the power grid. The installation and operation of the signals are governed under the authority of the National Highway Safety Act. The signals are put together to operate as a system and are merely powered by the electricity supplied to them. The technicians who install and maintain the traffic systems are specialized, much like computer or automobile technicians.

Consider that a traffic signal plugs into the power source similarly to a home appliance plugs into a home electrical system. Generally, appliances connected to the electrical system are exempt from Board regulation.

For these reasons the General Assembly should clarify that traffic signals are exempt from the Act.

Recommendation 8 – Repeal section 12-23-111(14), C.R.S.

Section 12-23-111, C.R.S., covers exemptions to the Act. Subsection 12-23-111(14), C.R.S., reads:

Nothing in [the Act] shall be construed to exempt any electrical work from inspection under the provisions of [the Act] except that which is specifically exempted in [the Act], and nothing in [the Act] shall be construed to exempt any electrical work from inspection by the Board or its inspectors upon order of the Board or from any required corrections connected therewith. However, no fees or charges may be charged for any such inspection except as set forth in [the Act], unless request for inspection has been made to the Board or its inspectors in writing, in which case, unless otherwise covered in this article, the actual expenses of the Board and its inspectors of the inspection involved shall be charged by and be paid to the Board. The Board is directed to make available and mail minimum standards pertaining to specific electrical installations on request and to charge a fee for the same, such fee not to exceed the actual cost involved, and in no case more than one dollar. Requests for copies of the national electrical code shall be filled when available, costs thereof not to exceed the actual cost to the Board.

This section speaks to two things, neither of which needs to be included in a section of the Act which lays out exemptions.

First, it speaks to mandatory inspections which are comprehensively covered in section 12-23-116, C.R.S. Notwithstanding, section 111(14), states that no electrical work can be exempt from inspection and associated fees. Therefore, inclusion in a section concerning inspection exemptions complicates the Act, is redundant, and unnecessary. It confuses those who read the Act.

The second issue is that section 111(14) states that the Board must supply copies of the Code upon request, for a fee. In practice, staff merely informs those who request a copy that the Code is available online for free. So this piece of the Act is neither an exemption nor necessary.

Therefore, the General Assembly should repeal section 12-23-111(14), C.R.S.

Recommendation 9 – Strike the word “alteration” from sections 12-23-111(3) and 111(4), C.R.S.

Sections 12-23-111(3) and 111(4), C.R.S., provide license and inspection exemptions “for maintenance, repair, or alteration of existing facilities” in certain properties.

The interpretation of the word “alteration” is problematic. There are instances when the exemption from regulation is claimed because an entire building renovation is undergoing an “alteration” to the existing electrical system. This provision was not meant to exempt major changes to electrical systems from the need to be permitted or inspected. Any work beyond replacing or repairing, lawfully-installed components must be permitted and inspected. The subjective nature of the word “alteration” leaves building occupants exposed to greater risk from electricity-related problems.

Not inspecting any installation or modification beyond the most basic maintenance and repair poses a threat to public safety.

Eliminating the ambiguous word “alteration” will eliminate confusion and protect the public by demanding that all qualifying installations are permitted and inspected. Therefore, the General Assembly should strike the word “alteration” from sections 12-23-111(3) and 111(4), C.R.S.

Appendix A - License Data

The following tables list the number of licenses issued and the methods used to obtain the licenses for each category of licensure during the fiscal years examined for this sunset review. Licenses expire every three years in September.

Summary of all Electrical License Types

All License Types

Fiscal Year	Examination / Original	Endorsement	Renewal	Reinstatement	Active Licenses as of June 30th
12-13	650	114	0	292	17,551
13-14	823	176	0	146	18,682
14-15	927	154	13,173	841	16,009
15-16	944	142	0	293	17,233
16-17	1004	190	0	157	18,580

Master Electrician

Fiscal Year	Examination	Endorsement	Renewal	Reinstatement	Active Licenses as of June 30th
12-13	125	28	0	57	5,571
13-14	179	21	0	36	5,800
14-15	239	12	4,071	174	5,258
15-16	205	29	0	57	5,433
16-17	218	31	0	28	5,716

Journeyman Electrician

Fiscal Year	Examination	Endorsement	Renewal	Reinstatement	Active Licenses as of June 30th
12-13	301	86	0	135	7,947
13-14	391	155	0	64	8,555
14-15	396	141	6,089	442	7,166
15-16	428	113	0	166	7,848
16-17	424	158	0	67	8,502

Residential Wireman

Fiscal Year	Examination	Endorsement	Renewal	Reinstatement	Active Licenses as of June 30th
12-13	32	0	0	15	588
13-14	60	0	0	14	662
14-15	67	1	344	33	459
15-16	110	0	0	11	573
16-17	125	1	0	5	713

Electrical Contractor

Fiscal Year	Original	Renewal	Reinstatement	Active Licenses as of June 30th
12-13	192	0	85	3,445
13-14	193	0	32	3,665
14-15	225	2,669	192	3,126
15-16	201	0	59	3,379
16-17	237	0	57	3,649

Electrical Apprentice

Fiscal Year	Original	Renewal	Reinstatement	Active Licenses as of June 30th
12-13	1,793	n/a	n/a	8,986
13-14	722	n/a	n/a	9,498
14-15	3,078	n/a	n/a	10,006
15-16	2,942	n/a	n/a	10,517
16-17	3,005	n/a	n/a	10,742

Appendix B - Complaint Data

The following tables list the number of complaints made each year considered for this sunset review, segregated by license type.

Master Electrician

Fiscal Year	Total
12-13	14
13-14	16
14-15	53
15-16	27
16-17	26

Journeyman Electrician

Fiscal Year	Total
12-13	27
13-14	29
14-15	157
15-16	50
16-17	40

Residential Wireman

Fiscal Year	Total
12-13	8
13-14	9
14-15	20
15-16	4
16-17	9

Electrical Contractor

Fiscal Year	Total
12-13	86
13-14	40
14-15	45
15-16	36
16-17	57

Electrical Apprentice

Fiscal Year	Total
12-13	5
13-14	7
14-15	10
15-16	12
16-17	19