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Re: **Comments of the California State Association of Electrical Workers  
and the California Coalition of Utility Employees on Draft  
Resolution ESRB-13**

Dear Ms. Buckley and Ms. Acimis:

We write on behalf of the California State Association of Electrical Workers and the Coalition of California Utility Employees to provide comments on Draft Resolution ESRB-13.<sup>1</sup> The proposed amendments to General Order (GO) 167 are an essential first step towards reducing the likelihood of catastrophic incidents caused by energy storage system (ESS) facilities. However, we urge the Commission to address a critical gap in the proposed order: workforce qualifications and training for ESS personnel.

Establishing minimum workforce standards for the maintenance and operation of ESS facilities is vital to ensure the safe operation of ESS. While the personnel standards in the proposed amendments to GO 167 are necessary to improve safety when ESS fire incidents occur, it is also critical to include personnel standards to **prevent** ESS failures. Specific workforce qualifications and training requirements significantly reduce the likelihood of incidents that can lead to dangerous fires and explosions by ensuring that ESS systems are operated and maintained safely and effectively by qualified personnel.

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<sup>1</sup> Draft Resolution ESRB-13 – Adopts General Order (GO) 167-C, Enforcement of Maintenance and Operation Standards for Electric Generating Facilities and Energy Storage Systems (Jan. 27, 2025).

To address this issue and minimize the potential for catastrophic incidents, GO 167 should require all electrical work on large and medium ESS facilities to be performed by certified electricians and a minimum of 50% of the onsite electricians hold an Energy Storage and Microgrid Training Certification (ESAMTAC).

### **A. GO 167's Personnel Standards Are Vague and Fail to Set Meaningful Requirements**

The proposed order includes general standards for maintenance and operations personnel for ESS over 50 megawatts (MW). Specifically, MS 5 and OS 5 require maintenance and operations personnel are “trained and qualified to possess and apply the knowledge and skills needed to perform” maintenance and operation “activities that support safe and reliable facility operation.”<sup>2</sup> MS 6 and OS 6 also require ESS owners to implement “a systematic approach to training” to “achieve, improve, and maintain a high level of personnel knowledge, skill and performance.”<sup>3</sup> OS 6 also requires a site-specific training program, including on-the-job training, that covers normal operations and “reasonably anticipated abnormal and emergency operations.”<sup>4</sup> Operations personnel must also be trained to ensure the facility’s safe and reliable operation.<sup>5</sup>

These standards are vague because they fail to define what constitutes “trained and qualified” personnel, what constitutes the “knowledge and skills needed,” what constitutes “a high level of personnel knowledge, skill and performance, and fail to establish minimum training requirements.” Without clearly defined workforce standards, ESS owners may rely on inadequately trained personnel, increasing the risk of electrical hazards, operational failures, and safety incidents.

ESS facilities involve complex electrical components, high-voltage systems, and potential fire hazards, particularly in lithium-ion battery applications. Proper maintenance and operation require specialized expertise that general training programs do not provide. Without specific minimum workforce qualifications, there is no guarantee that personnel working on ESS facilities have the necessary expertise to safely manage electrical infrastructure, troubleshoot issues, and prevent system failures. This lack of clarity creates a regulatory loophole, allowing ill-equipped personnel to perform critical operation and maintenance tasks,

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<sup>2</sup> Appendix C at p. C-1.

<sup>3</sup> Appendix C at p. C-1; Appendix D at p. D-1.

<sup>4</sup> Appendix D at p. D-1.

<sup>5</sup> Appendix D at p. D-1.

heightening the risk of electrical faults, thermal runaway events, and operational failures.

## **B. Minimum Workforce Standards for Personnel Performing Electrical Work Are Necessary**

There are two well defined standards that would ensure personnel performing electrical work on ESS facilities have sufficient training and experience to substantially reduce the risk of hazards that can lead to or exacerbate catastrophic incidents: (1) requiring all electrical work to be performed by state-certified general electricians, and (2) ensuring that at least 50% of onsite certified electricians hold an ESAMTAC credential.

### *1. Certified Electricians*

Certified general electricians receive extensive training in national and local electrical codes, ensuring that installations meet stringent safety standards. These codes and standards address critical issues such as grounding, circuit protection, system integrity, and fire prevention – all essential for the safe operation of ESS facilities.

In California, a general electrician must be state-certified to legally perform electrical work.<sup>6</sup> Certification requires a combination of formal education through an apprenticeship or trade school, practical experience, and passage of a certification exam. Trainee electricians<sup>7</sup> and registered apprentice electricians<sup>8</sup> are actively working toward certification while enrolled in state-approved apprenticeship programs or are working under the supervision of a general electrician. While not yet fully certified, these individuals are registered with the state and legally permitted to perform electrical work under supervision.

State-certified general electricians must perform at least 8,000 hours of work for an electrical contractor installing, constructing, or maintaining systems covered by the National Electrical Code. Their expertise is critical to the complex, high-voltage electrical work involved in ESS facilities – including installation, assembly,

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<sup>6</sup> 8 Cal. Code Regs. § 290.1.

<sup>7</sup> 8 Cal. Code Regs. § 290.1.

<sup>8</sup> “Registered apprentice electrician” means a registered apprentice performing electrical work as part of an apprenticeship program approved under Chapter 4 of Division 3 (commencing with Section 3070) of the Labor Code, a federal Office of Apprenticeship program, or a state apprenticeship program authorized by the federal Office of Apprenticeship.

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testing, maintenance, repair, retrofitting, commissioning, and decommissioning. Ensuring that only properly trained and certified personnel perform this work reduces the likelihood of electrical faults, thermal runaway, fires, and equipment failures, all of which pose significant risks to ESS facilities, surrounding communities and the environment.

## 2. *ESAMTAC*

While state certification establishes a baseline of competency in electrical safety and installation, it does not include training specific to ESS. The only certification program that provides electricians with specialized training in the safe installation and maintenance of ESS is ESAMTAC. This certification builds on the state general electrician certification requirements to equip these electricians with the advanced skills necessary to recognize and address the unique fire and safety risks posed by ESS.

The ESAMTAC Initiative, led by Penn State University, is a nonprofit, brand-neutral, national training and certification program that uphold standards set by the National Fire Protection Association, National Electrical Installation Standards, National Electrical Code, American Standards Institute, and Electric Power Research Institute.<sup>9</sup> This program provides specialized training and credentialing for electrical contractors and workers, focusing on the unique challenges of energy storage and microgrid systems. The ESAMTAC certification emphasizes safe and effective practices in installation, assembly, testing, commissioning, maintenance, repair, retrofitting, and decommissioning.

Safety is one of the most critical benefits of requiring an ESAMTAC credential. ESS present unique hazards, including thermal runaway, arc flash risks, high-voltage DC systems, and fire hazards. Without proper training, workers may inadvertently introduce safety risks that could lead to system failures, property damage, and even life-threatening incidents. A required certification ensures that individuals performing electrical work on an ESS possess knowledge of best practices and safety protocols, reducing accidents, malfunctions, and electrical failures.

Beyond safety, requiring specialized training will also improve grid reliability. Standardized certification ensures that only properly trained

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<sup>9</sup> Energy Storage + Microgrid Training + Certification, <https://static1.squarespace.com/static/5cdeccde68001b0001812290/t/6082c2767a3a920b64087180/1619182200637/ESAM-TAC+Flyer.pdf> (last visited Mar. 3, 2025).

professionals work on these systems, reducing installation and maintenance errors that can lead to grid disruptions or system failures. Proper integration of ESS with other grid components will improve overall system performance, ensuring consistent and reliable energy supply. A trained workforce leads to higher-quality installations and maintenance practices, which both reduces the risk of fire and explosion, and also contributes to a more resilient energy grid by reducing operational failures and shutdowns.

California is uniquely positioned to lead in this area, with hundreds of electricians receiving ESAMTAC training and certification every year ensuring an available workforce to meet the needs of the large and mid-sized ESS facilities that would be subject to the amended GO 167. Furthermore, ESAMTAC training is integrated into several state-certified apprenticeship programs, ensuring that future electricians receive specialized ESS training as part of their professional development.<sup>10</sup> Adopting this certification will drive demand for specialized workforce training, ultimately increasing safety and reliability in ESS deployment and operation. Establishing a uniform standard for ESS-related electrical work ensures that all personnel possess the necessary expertise to install, maintain, repair, and operate energy storage infrastructure safely and effectively.

Given the well-documented risks and technical complexities associated with ESS facilities, the Commission should require that at least 50% of the onsite certified electricians hold an ESAMTAC credential. This requirement will ensure that a substantial portion of the workforce has specialized training in ESS safety and maintenance, significantly reducing the likelihood of catastrophic failures.

### *3. Exemption for Employees of Electrical Corporations*

While minimum workforce standards should apply broadly to ensure the safety and reliability of ESS facilities, an exemption should be made for facilities owned, operated, and maintained by employees of an electrical corporation. These employees already undergo rigorous training, adhere to strict safety protocols, and operate under comprehensive regulatory oversight. Given these existing

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<sup>10</sup> The ESAMTAC program at the San Diego Electrical Training Institute was launched in Fall 2018, years earlier than any other jurisdiction in the United States and Canada. More recently, the states of California, Nevada, and New York have each launched programs to increase ESAMTAC. California Climate Investments, Expanding Energy Storage and Microgrid Training and Certification, <https://www.caclimateinvestments.ca.gov/2022-profiles/low-carbon-workforce> (Mar. 16, 2022); American Public Power Association, NYPA Partners with Energy Storage and Microgrid Training and Certification Program, <https://www.publicpower.org/periodical/article/nypa-partners-with-energy-storage-and-microgrid-training-and-certification-program> (June 1, 2023).

safeguards, exempting electrical corporation employees from additional certification requirements would avoid redundancy while maintaining the highest levels of safety and reliability.

### **C. Workforce Standards Should Apply to Large and Medium ESS Facilities**

Workforce standards for maintenance and operations personnel should apply to all ESS facilities exceeding 1 MW, rather than being limited to those over 50 MW. While large ESS facilities pose significant risks, medium facilities still involve complex electrical systems, high-voltage equipment, and potential fire hazards. The risks associated with improper maintenance and operation exist at all scales, making it essential to establish clear workforce training and qualification requirements for any facility above 1 MW.

Limiting workforce standards to facilities over 50 MW creates a regulatory gap that could lead to inconsistent training and oversight across a significant portion of the energy storage market. Many commercial and industrial-scale ESS projects fall between 1 MW and 50 MW, and these facilities are often located near businesses, critical infrastructure, and residential areas. Ensuring that personnel working on these systems meet minimum training and certification requirements will help prevent safety hazards and operational failures.

Requiring workforce standards for facilities over 1 MW will also drive demand for specialized ESS training and certifications, fostering a more skilled and knowledgeable workforce that will be available even for those facilities that are not subject to the amended GO 167. As California continues to expand its energy storage capacity, a uniform workforce standard will help create a consistent, industry-wide expectation for safety, training, and operational excellence. This approach benefits not only workers and facility owners but also regulators and first responders, who will have greater confidence in the safe operation of ESS facilities.

To maximize safety, reliability, and operational integrity, workforce standards should apply to all ESS facilities exceeding 1 MW. This threshold ensures that even medium-scale installations are managed by trained personnel who understand the complexities and risks of energy storage systems. A clear and consistent workforce standard will prevent regulatory gaps, enhance grid stability, and promote a well-trained workforce capable of supporting California's growing energy storage industry.

#### **D. Conclusion**

Clear and enforceable workforce standards are essential to ensuring the safe and reliable deployment of ESS. Requiring the use of certified electricians with ESAMTAC credentials for all electrical work during the maintenance and operation of large and medium ESS facilities will close training gaps, prevent regulatory loopholes, and ensure that these systems are managed by highly qualified personnel. This approach will enhance safety, reduce operational risks, and support California's clean energy goals while protecting workers, communities, the environment, and the stability of the electrical grid.

Sincerely,



Andrew J. Graf

AJG:acp  
Attachment A – Recommended Changes to GO 167

## Attachment A

ESRB-14 Section or Page Number	Recommended Changes
<b>General Order 167</b>	
2	<p>Add the following definitions:</p> <p>“Certified electrician” means (1) general electrician as defined in Title 8, Section 290.1 of the California Code of Regulations, (2) electrician trainee as defined in Title 8, Section 290.1 of the California Code of Regulations, and (3) registered apprentice electrician performing electrical work as part of an apprenticeship program approved under Chapter 4 of Division 3 (commencing with Section 3070) of the Labor Code, a federal Office of Apprenticeship program, or a state apprenticeship program authorized by the federal Office of Apprenticeship.</p> <p>“ESAMTAC” means Energy Storage and Microgrid Training and Certification.</p>
3.3	Clarify that ESSs of one megawatt or larger but smaller than 50 megawatts are not exempt from the minimum workforce standards.
<b>Appendix C: Maintenance Standards</b>	
C-1, MS 5	Add the following: “All electrical work on an ESS facility shall be performed by certified electricians and a minimum of 50% of the onsite electricians shall hold an ESAMTAC credential.”
<b>Appendix D: Operation Standards</b>	
D-1, OS 5	Add the following: “All electrical work on an ESS facility shall be performed by certified electricians and a minimum of 50% of the onsite electricians shall hold an ESAMTAC credential.”