

August 28, 2019

Arizona Corporation Commission
1200 W Washington Street
Phoenix, AZ 85007

RE: Matter of the Commission's Inquiry of Arizona Public Service Battery Incident at the McMicken Energy Storage Facility Pursuant to Arizona Administrative Code R-14-2-101 (Docket No. E-01345A-19-0076)

Dear Chairman Burns and Commissioners:

The U.S. Energy Storage Association (ESA) appreciates the opportunity to address certain misunderstandings about energy storage in Commissioner Kennedy's letter filed August 2, 2019, in the above-referenced docket, as well as to provide additional information highlighting our industry's actions to ensure the continued safe and reliable deployment of energy storage across the country.

ESA is the national trade association dedicated to energy storage, working toward a more resilient, efficient, sustainable and affordable electricity grid – as is uniquely enabled by energy storage. With more than 180 members, ESA represents a diverse group of companies, including independent power producers, electric utilities, energy service companies, financiers, insurers, law firms, installers, manufacturers, component suppliers, and integrators involved in deploying energy storage systems around the globe. Further, our members work with all types of energy storage technologies and chemistries, including lithium-ion, advanced lead-acid, flow batteries, zinc-air, compressed air, and pumped hydro, among others.

Safety incidents related to grid-connected energy storage systems are rare in the United States; nonetheless, like all others forms of energy generation and electric infrastructure, they do require continuous efforts to manage risk effectively.

In the electric distribution system, utilities routinely and diligently make sure delivering electricity is safe by mitigating risks inherent in generating and transmitting high-voltage electricity over long distances across vastly different terrain and weather conditions. Large-scale batteries are one of the many resources of domestic energy and infrastructure that utilities regularly monitor to identify potential risks, as per the National Electrical Safety Code and other applicable codes and standards. All technologies currently operating on the grid must meet these requirements. In addition, a number of technical certification standards, developed by organizations such as Underwriters Laboratories (UL) and CSA Group (formerly Canadian Standards Association), govern the U.S. energy storage industry and manage risk in the design of energy storage systems. ESA and many of our members are also engaged

actively with the National Fire Prevention Association (NFPA) and the International Code Council (which authors the International Fire Code, or IFC) regarding standards that manage risk in the installation and operations of energy storage systems and recommended procedures for first-responders when encountering a battery fire event.

Advanced energy storage systems, including those that use lithium-ion chemistries, have been and can continue to be deployed safely and in ways that minimize the risk of fire and human injury. In May 2018, DNV-GL issued a public report, *Quantitative Risk Analysis for Battery Energy Storage Sites*,¹ that found that lithium-ion-based energy storage systems can be categorized as low-risk as long as sites include common safeguards, such as UL 1973 design criteria, active cooling and thermal management, active fire suppression, remote monitoring, and other features described in the report.

Leading system operators and utilities around the country today are repeatedly choosing energy storage in competitive tenders, demonstrating its crucial role in modernizing our grid to make it more resilient, reliable, efficient, sustainable and affordable.

According to Wood Mackenzie Power & Renewables, at the end of 2018, 1 gigawatt of battery-based energy storage projects were operational in the United States across more than 20 states. Nearly 95% of these systems use lithium-ion battery technology, the same technology preferred by the world's leading automotive OEMs and safely deployed in vehicles for more than a decade. Grid battery energy storage systems are professionally designed and installed and are built to stringent safety standards with state-of-the-art monitoring systems. Some of the country's leading utilities -- including all three of Arizona's largest utilities, Hawaiian Electric Company, Xcel Colorado, Duke Energy, NV Energy and California's investor-owned-utilities -- have chosen battery energy storage systems as a cost-effective tool for meeting their states' environmental and energy policy goals. Other private developers and independent power producers have also installed and safely operated these systems on the bulk transmission grid over many years.

Large scale, lithium-ion based energy storage systems have been in reliable operation for more than ten years in the US and globally; for example:

- In 2008, AES installed two, 1MW lithium-ion based energy storage systems at an Indianapolis Power & Light (IPL) substation.
- AES installed a 32 MW lithium-ion battery-based energy storage system that has been operating at its Laurel Mountain wind farm in West Virginia since 2011.
- Invenergy's 31.5 MW Grand Ridge Energy Storage lithium-ion energy storage system, along with the RES Group's 20 MW Jake Energy Storage and 20 MW Elwood Energy Storage plants have all been operating in Illinois since 2015.

¹ Report is available at <https://www.dnvgl.com/publications/quantitative-risk-analysis-for-battery-energy-storage-sites-154811>

- Invenergy’s 31.5 MW Beech Ridge Energy Storage lithium-ion energy storage system has been operating in West Virginia since 2015.
- AES Energy Storage (now part of Fluence) built a 30 MW energy storage project using lithium-ion batteries at a San Diego Gas & Electric substation in Escondido, California. It has been in operation since 2017.
- GE Power Services commissioned a 10 MW lithium-ion battery integrated with a 50 MW gas-fired turbine in Southern California Edison territory. It has been operational since 2017.
- Tesla’s 100 MW Hornsdale lithium-ion battery-based energy storage system has been operating in South Australia since late 2017.

We recommend the Commission and Arizona utilities ensure adoption of the appropriate standards applicable to new storage system installations and implement emergency response plans to minimize the low risk of safety incidents at storage facilities.

Energy storage *system*-level safety risks must be addressed, planned for, and mitigated. Grid energy storage projects are comprised of a system of technologies, not simply the storage medium. All types of battery chemistries and other storage technologies must be integrated with power electronics, system controls, environmental controls, safety equipment, transformers, and other electrical components to perform grid services as intelligent and safe systems. ESA welcomes the opportunity to work with the Commission to ensure that all future energy storage systems meet the applicable codes and standards and that appropriate response plans and training are in place aimed at addressing safety for all battery chemistries and storage technologies.

ESA recommends the Commission encourage Arizona’s utilities and storage project developers to work with relevant state and local authorities, first responders, and code officials to ensure the orientation and information necessary to:

- Develop and implement appropriate emergency response plans to minimize risk to installers, operators, first responders and others;
- Incorporate the latest industry standards, such as NFPA 855 and UL 9540, into Arizona’s rules governing the installation and operation of energy storage systems of all chemistries; and
- Ensure that all future energy storage systems deployed in the state meet these requirements.

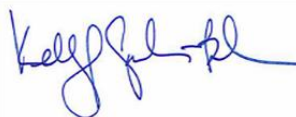
ESA agrees safety is a priority and is working with our industry and stakeholders to ensure safe operation of lithium-ion energy storage systems.

ESA is committed to working together with industry members and stakeholders to ensure that all types of energy storage systems, including those based on lithium-ion chemistries, incorporate robust safeguards that ensure safety during all phases of the life cycle, including planning, construction,

operation, maintenance, and decommissioning. The first and foremost concern should be for the health and safety of first responders, as well as the general public. ESA and companies in the industry, including Arizona Public Service, are presently developing industry best practices on safety through our Corporate Responsibility Initiative, which was launched in early 2019. Through this effort, we are creating a template Emergency Response Plan that addresses a range of hazards -- extreme weather, fires, seismic events, and active shooters -- to further protect the safety of all people in and around storage systems – our employees, customers, first responders and communities.

We look forward to working with the Commission to ensure that the safety standards governing the deployment and operation of energy storage technologies in the State of Arizona reflect national standards as well as the industry’s best practices. Please do not hesitate to contact us if you would like additional information about ESA.

Respectfully,

A handwritten signature in blue ink, appearing to read "Kelly Speakes-Backman".

Kelly Speakes-Backman
CEO
U.S. Energy Storage Association