

October 30, 2025

Mayor and Council Members
City of Kawartha Lakes
26 Francis Street
Lindsay, Ontario K9V 5R8

Neoen has engaged Energy Safety Response Group (ESRG) to serve as the fire and life safety consultants for the proposed Woodville Battery Storage System (BESS). ESRG offers safety expertise throughout the energy storage industry by supporting product design, testing, permitting, training and emergency response.

The global installed capacity of utility-scale BESS has dramatically increased over the last five years. Between 2018 and 2023, the global grid-scale BESS failure rate has dropped 97%.¹ Work by the Electric Power Research Institute (EPRI), along with the Pacific Northwest National Laboratory, shows a decrease in global failure rates from 9.2 per gigawatt (GW) in 2018 to .2 per GW in 2023.²

There is extensive engineering and design considerations related to fire prevention, suppression, and safety management systems.

- Active fault detection and intervention exists in the integrated Battery Management System (BMS). The BMS monitored 24/7 has key datapoints such as voltage, current, and state of charge (SOC) of battery cells, in addition to providing control of corrective and protective actions in response to any abnormal conditions. Each battery module is equipped with a dedicated BMS. Critical BMS sensing parameters include battery module over / under voltage, cell string over / under voltage, battery module over temperature, temperature signal loss, and battery module over current. In the event of any abnormal conditions, the BMS will generally first raise an information warning, and then trigger a corresponding corrective action should certain levels be reached.

Furthermore, safety protocols, standards, and best practices are built into every stage – from design and installation to monitoring and emergency response

- Stringent modern codes and standards such as NFPA- 855 and UL-9540 require several independent preventative features to be included to minimize the risk of fire. Additionally, stationary battery energy storage systems (ESS) are required to conduct destructive full-scale fire and fault condition testing, known as UL 9540A, to assess the hazards associated with individual systems and design adequate fire protection systems. With all these features in place and fully operational, the likelihood of a fire is reduced even further. These features include a battery management system, remote monitoring, gas detection, ventilation, and in some installations, fire suppression.
- Most ESS are adequately spaced to ensure that a fully developed fire will not cascade to any adjacent containers (or units). This is primarily validated by full-scale fire testing or in some instances computer aided heat flux analyses. If necessary, fire water may be applied to the exterior of adjacent containers or exposures by the fire department to reduce the heat impact and minimize the possibility of fire spread. Full details of approach will be included in the emergency response plan and fire safety plan.

¹ *Insights from EPRI's Battery Energy Storage Systems (BESS) Failure Incident Database. 2024 White Paper.* EPRI.

- In addition, some battery installations may incorporate some form of flammable gas detection / elimination / ventilation equipment as a measure of explosion prevention. These sensors act to detect, eliminate, and/or ventilate flammable gases from the container atmosphere. These explosion prevention systems are designed to the National Fire Protection Association (NFPA) standards.
- In instances where self-contained outdoor enclosures or cabinets are utilized, the enclosures are tested per UL-9540a and equipped with overpressure relief mechanisms as required. This method of deflagration protection will reduce the impact associated with deflagrations and is designed to NFPA 68 & 69 standards as well.
- Hazard Mitigation Assessments (HMA) are required by both International Fire Code (IFC), as well as NFPA 855 (currently in the third addition of 855). These assessments review compliance with UL9540, NFPA 72 compliant fire protection system, NFPA 68 & 69 deflagration protection analysis. Emergency response plan (ERP) with subject matter expert and fire department training. These codes require specific spacing between units that reduce fire risk between units, best practices in regard to ventilation and cooling, monitoring protocols, automated and manual emergency disconnects, and more.

In conclusion, Energy storage systems are heavily regulated, require extensive testing and certification, mandate multiple layers of active protection systems, and require active or passive protection mechanisms when deployed in the field. Beyond that, best practice (and regulations in some jurisdictions) mandate emergency response planning (ERP), training for the fire department, and the 24/7 availability of subject matter experts (SMEs) to support local fire service response. When applied together, this process drastically improves safety and the ability of first responders to manage an incident appropriately. My firm specializes in the preparation of these plans and training and coordination with first responders, and I look forward to supporting Neoen in these efforts as construction approaches. Neoen is committed to providing the local Fire Department with the training and information necessary to respond to such an event safely. ESRG can conduct training sessions where experienced fire safety professionals can review in-depth emergency protocols, guidelines for water use, safe distances for personnel, and important information on individual system components.

Respectfully,

Paul Brown