

BESS Project Profile
Technology - Lithium-ion Chemistry
Manufacturer/Supplier - General Electric (GE)
Fire Suppression Agent - Stat-X Clean Agent
Installation - Outdoor/Walk-in Unit
Location - Warwick & Hubbard, NY

Ref #	Fire Protection Component	Response Strategy		
		Risk Owner	Mitigation Strategy	Additional Info.
1	Safety Caps	n/a	Prevent hydrogen release from batteries and pressure build up in enclosure.	This requirement does not apply to Lithium-ion battery systems due to low risk based on battery chemistry and no hydrogen emissions from battery.
2	Spill Control and Neutralization	n/a	Prevent fire due to spilled flammable battery electrolyte (or other associated chemicals).	This requirement does not apply to Lithium-ion battery systems due to low risk based on sealed battery type and no free-flowing liquid electrolyte.
3	Exhaust Ventilation	n/a	Prevent fire due to battery gas (or other associated vapors) emissions.	This requirement does not apply to Lithium-ion battery systems due to sealed battery type and minimal battery gas emissions.
4	Explosion Control	GE	Deflagration control by maintaining flammable gas emissions below 25% Lower Flammable Limit (LFL).	This requirement is typically waived by fire code officials if battery chemistry composition does not contain potential to release flammable gasses in excess of 25% LFL, such as with proposed Lithium-ion battery systems.
5	Smoke and Automatic Fire Detection	GE	Carbon monoxide programmed gas detector shall be installed to detect smoke before temperature rise significantly.	Each RSU is designed with two (2) detection zones - Battery compartment and Electrical Compartment. Battery compartment contains a total of 4x Conventional (non-addressable) Photoelectric Smoke Detector detectors, type CPS-24. Electrical compartment contains a total of Total of 3 x Addressable Photoelectric Smoke Detector detectors, type PAD100-PD.
		Convergent E&P	Specify design requirement. Review and approve GE design.	
6	Thermal Runaway	GE	BESS shall be designed to minimize the impact of thermal runaway.	BESS is designed and supplied with various devices and/or mechanisms to prevent, detect and minimize the impact of thermal runaway.
		Convergent E&P	Specify design requirement. Review and approve GE design.	
7	Equipment Listing	GE	All BESS equipment installed shall be code compliant, rated accordingly and suitable for use-case.	BESS including chargers, inverters, and other integral components shall be listed according to UL 9540. For utility interactive systems, inverters shall be rated for utility interactive system use and listed and labeled according to UL 1741.
		Convergent E&P	Specify design requirement. Review and approve GE design.	
8	Energy Storage Management System	GE	Battery Monitoring System (BMS) shall disconnect electrical equipment or place it in a safe operating condition if potentially hazardous temperatures or other conditions such as short circuits, overvoltages, overcurrents, etc are detected	BMS shall be designed to monitor, relay and balance battery cell voltages, currents and temperatures. System shall have the ability to isolate affected modules from the rest of the system.
		Convergent E&P	Battery Monitoring System (BMS) shall disconnect electrical equipment or place it in a safe operating condition if potentially hazardous temperatures or other conditions such as short circuits, overvoltages, overcurrents, etc are detected	BMS shall be designed to monitor, relay and balance battery cell voltages, currents and temperatures. System shall have the ability to isolate affected modules from the rest of the system.
9	Fire Detection	GE	Signals shall be provided in the presence of potentially hazardous temperatures or radiant energy. Alarm signals shall be transmitted to a central panel. Fire suppression and emergency shutdown procedures shall be activated accordingly.	BESS shall be designed and supplied with interior and exterior horn/strobes, and fire control panel with contacts to facilitate signal transmission to Convergent E&P.
		Convergent E&P	Signals shall be provided in the presence of potentially hazardous temperatures or radiant energy. Alarm signals shall be transmitted to Convergent E&P NOC. Emergency contacts, Fire Department and first responders shall be notified accordingly.	Comprehensive fire safety plan shall be developed to detail response measures in the unlikely event of a fire.
10	Fire Suppression Systems	GE	Automatic fire extinguishing system shall be provided in accordance with fire code and NFPA 2001, to be activated in the unlikely event of a fire. The aerosol shall suspend in air for extended suppression hold times to prevent further propagation of fire.	BESS to be designed and supplied with fire suppression clean agent Stat-X. Each RSU shall contain 8 x 500g Stat-X canisters in the battery compartment, 3 x 100g canisters plus 1 60g thermal canister in the electrical compartment. Systems are installed based on established and tested design densities and application rates are designed specifically to the volume of the compartment being protected.
		Convergent E&P	Specify design requirement. Review and approve GE design.	
11	Electrical Disconnects	GE	System shall be designed in such a way as to isolate affected modules, zones, equipment or entire system as necessary to stop the spread of fire. Manual disconnects shall be installed in a secure location with signage to direct first responders.	BESS shall be furnished with a manual disconnect switch and fire control panel with contacts to facilitate signal transmission for remote electrical disconnect operation. BMS will also facilitate electrical disconnects.
		Convergent E&P	System shall be designed in such a way as to isolate affected modules, zones, equipment or entire system as necessary to stop the spread of fire. Manual disconnects shall be installed in a secure location with signage to direct first responders.	System and facility shutdown plan in event of fire shall be established by Convergent E&P.
12	Equipment Enclosures Ratings	GE	Equipment shall be of noncombustible construction with a 2-hour fire rating.	
		Convergent E&P	Specify design requirement. Review and approve GE design.	
13	Equipment Signage	GE	Signs and equipment nameplates shall be provided on all equipment, enclosures and entry doors.	Signage to include - safety warnings, associated special hazards, equipment nameplate information, and access authorizations at the minimum in addition to NEC requirements.
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14	Combustible Storage Restrictions	GE	Combustible material shall not be located in RSU or within 3ft of the BESS.	
		Convergent E&P	Combustible material shall not be located in RSU or within 3ft of the BESS.	
15	Security of Installations	GE	BESS shall be secured against unauthorized entry and safe-guarded using signage and locks.	
		Convergent E&P	BESS shall be secured against unauthorized entry and safe-guarded using signage, fencing, security lighting, cameras, and locks.	Vehicle impact protection may also be provide if necessary.
16	Vegetation Control	GE	n/a	
		Convergent E&P	Areas within 10ft of BESS shall be cleared of combustible vegetation to potential prevent the spread of fire.	
17	Fire Remediation Plan	GE	Shall establish procedure and provide support personnel in the unlikely event of a fire. Ensure that fire suppression is effective and maintained until affected equipment is restored or decommissioned.	
		Convergent E&P	Shall collaborate with GE to adapt remediation procedure into Convergent E&P project plan documents.	
18	BESS Commissioning Plan	GE	Shall facilitate a complete, successful and documented commissioning of all BESS site equipment.	Commissioning plan shall include description of activities, components, conditions, documentations, verifications, testing and training (were applicable) for all fire, safety, thermal management and ventilation systems.
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19	BESS Operators & Maintenance Manual	GE	Shall provide site-specific O&M documentation detailing design and construction information, manufacturer recommendations for routine maintenance, service contact, maintenance schedule, calibrations, and other specific instructions.	
		Convergent E&P	Shall ensure that routine maintenance is performed according to manufacturer requirements.	Special attention shall be paid to routine inspection and testing of all fire, safety, thermal management and ventilation systems.
20	Decommissioning Plan	GE	Shall establish and facilitate plan for BESS end-of-life and hazard-related decommissioning.	Plan shall include safe, code-complaint removal of BESS and restoration of site. It shall also include any contingencies for removing a BESS that has been damaged by a fire from service.
		Convergent E&P	Shall establish and enforce plan for BESS end-of-life and hazard-related decommissioning.	Plan shall include safe, code-complaint removal of BESS and restoration of site. It shall also include any contingencies for removing a BESS that has been damaged by a fire from service.