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Testing, Inspection, and Certification

Reliable testing expertise across major industries around the world

4 Business Units
2000 Employees
+2250 Accredited Certification Programs
39 Offices
+200 Countries
Certification Marks and Labels

CSA Group certification marks are recognized throughout the world on many common household items, as well as commercial equipment. Some examples shown below:
Responsibility for the Safety of ESS is Shared

- ESS are commonly a complicated integration of components from multiple organizations, often assembled on site.
- Compliance can involve certification and field evaluation.

Diagram:
- System Owner/Operator
- Authority Having Jurisdiction (AHJ)
- TIC Organization
- System Integrator / Manufacturer
- Battery Manufacturer
- Inverter Manufacturer
- Contractor(s)
- Other Component Suppliers
Requirements and challenges for ES compliance

• **Component and sub-system certification**
  ▪ Ensure all critical components meet their respective standards
  ▪ Major components include battery (UL 1973) and inverter (UL 1741)

• **Safety analysis**
  ▪ Detailed analysis, typically Failure Mode and Effects Analysis (FMEA) is required to determine fault conditions & functional safety requirements

• **Functional safety (FS)**
  ▪ Review of software and electronics/controls is required when they provide primary safety for the system

• **System certification**
  ▪ UL 9540 now encompasses the entire ES system
  ▪ UL 9540A required to satisfy fire testing requirements for NFPA 855

• **Field evaluation**
  ▪ Final inspection in the field may be required to confirm that the system meets installation requirements and codes

See CSA Group for:

• UL 1973
• UL 9540
• UL 9540A

• **Component Standards**
  ▪ Enclosure – UL 50E, CAN/CSA-C22.2 No. 60529
  ▪ Inverter – C22.2 No. 107.1; UL 1741; IEEE 1547
  ▪ Functional Safety – UL 991, 1998; IEC 61508

• **Field evaluation**
• **Cybersecurity**
C22.2 No. 340 – Battery Management System Standard

• Scope
  ▪ Design, performance, and safety of battery management systems.
  ▪ Battery management systems in all applications including:
    - Stationary batteries
    - Batteries used to power mobility applications
    - Appliances and machinery used in consumer/residential, commercial, and industrial settings.

• Status
  ▪ Seed document under development under CSA Group guidance
  ▪ Sub-committee of industry participants

• Next steps and timeline
  ▪ Seed document submitted to full committee in Spring 2019
  ▪ Draft for public review in late 2019