

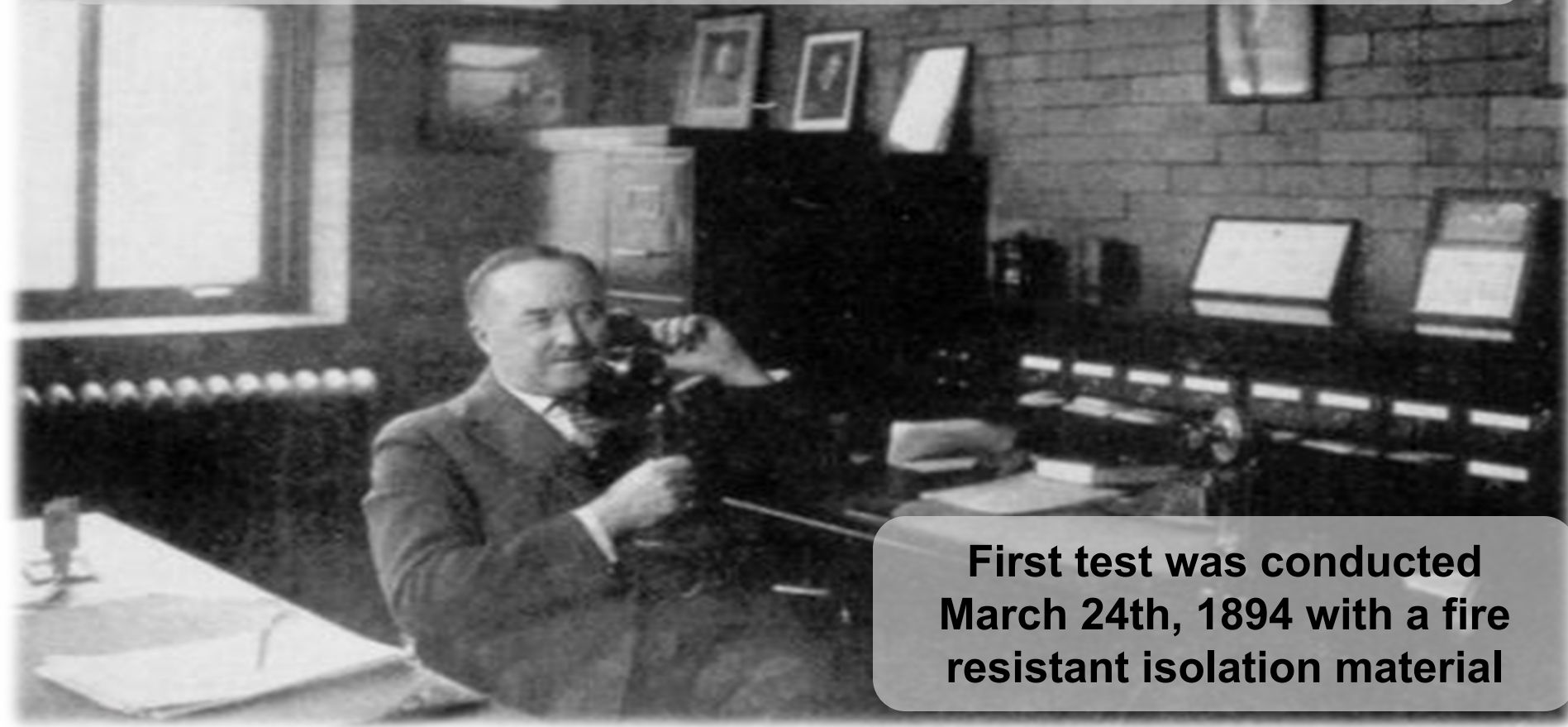
# Energy Storage and Battery System Services

NAATBatt 2022 Member Update

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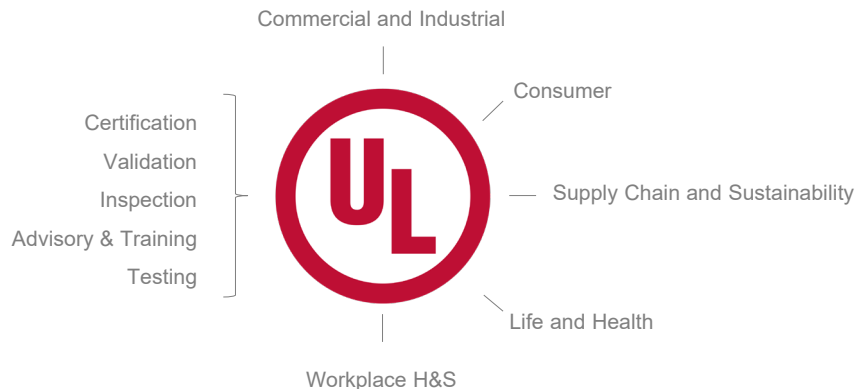


**Founded in 1894 by William H. Merrill as Underwriters Electrical Bureau, Monroe Street in Chicago, Ill.**



**First test was conducted  
March 24th, 1894 with a fire  
resistant isolation material**

# UL in numbers – Providing services for a Safer World



## 125+ years

Founded in 1894

Headquartered at Northbrook, IL (USA)

#1 Safety mark in North America

22 Billion UL marks appear on products



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## 104+ countries

With UL customers

152 UL laboratories for testing and certification

73 Facilities in the UL family of companies

### We Provide Global Market Acceptance

Our marks are on nearly 22 billion products worldwide, per year, signaling peace of mind to consumers, customers, businesses, and governments.



## 1,400+ Standards

# Published standards and 20,000 types of products were evaluated by UL

# Know UL? Think Again – We Provide Solutions Across The Value Chain



Value  
Chain

## Materials

Certification  
Performance  
Traceability  
ISO 9000  
Lean Sigma

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Manufacturer  
Distributor

## Component

Certifications  
Performance  
Advisory service  
FUS inspection  
Traceability  
ISO 9000  
Education  
Lean Sigma

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Manufacturer  
Assembler

## System Component

Certification  
Performance  
Advisory service  
Traceability  
FUS inspection  
ISO 9000  
Education  
Lean Sigma

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Manufacturer  
Distributor  
Intermediary

## Planning & Design

Project development  
Advisory service  
Design review  
Education

-----  
Developer  
Financier  
EPC  
Installer

## Construction

Monitoring  
Site inspection  
Field inspection  
Field evaluation  
Performance  
Lean Sigma

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Owner  
Developer  
Financier  
EPC  
Construction

## O&M and Asset management

Site inspection  
Field Inspection  
Field Evaluation  
Lean Sigma

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Owner  
Operator



# Providing Leadership in the Code Community to Support Principles for Safe Integration of Batteries and ESSs into the Infrastructure



**Electric Vehicle**  
- LEV/ EV/ PEV/ E-Bus



**Stationary Batteries**

- Facilities power backup modular
- UPS, telecom equipment



**Industrial Vehicles & Tools**  
Train, airplane, fork-lift truck, etc.



**Energy Storage System**  
Battery + Inverter + Energy sources  
(PV/Wind/others)



# Using Safety Science to Characterize Fire Risks in ESS Through the Development of UL 9540A in Support of the Regulatory Environment

## NFPA 1, NFPA 855, Fire Code 2018

- Limits size and MAQ based upon technology
- Limits on separation distances
- Provides exceptions based upon large scale fire testing and Listing of BESS - UL9540A

## ICC IFC, International Fire Code 2018 & 2021

- Limits size (per technology and Listing) and separation distances for BESS installations
- Has MAQs per technology
- Provides exception based upon large scale fire testing – UL9540A
- Listing to UL 1973 (battery system) or UL 9540 (BESS)



# Advancing Battery Safety and the Circular Economy Through the Publication of UL 1974 to Support Safe Repurposing of EV Batteries



- UL 1974 is a “manufacturing process” standard that looks at the methods used to determine the safety and performance of batteries, modules, and cells from used EV battery systems (i.e. repurposing process)
- Assembled batteries need to meet the end product requirements when re-assembled into a 2<sup>nd</sup> use battery
  - ▶ e.g. UL 1973 is used for stationary batteries





# Progressing Solar + Storage and New Technology Platforms to Support Expanded Use of Battery Technologies

## Safety Certification of ESS Technologies

- Lithium Ion      Capacitors
- Flow Batteries   Thermal Battery
- Flywheels      Sodium Sulfur

## Large Scale Fire Testing

## Due Diligence – UL Renewables





# WORKING WITH GLOBAL REGULATORS TO DEFINE APPROPRIATE MEASURES FOR SAFE AND SUSTAINABLE BATTERY DEPLOYMENTS, FROM THE US CPSC, TO ASIA, TO THE EU, TO AFRICA



**40+**

Office locations

**500+**

Renewable energy experts

● Key Locations



WIND



SOLAR



OFFSHORE



STORAGE



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