

RESPONDING TO ENERGY STORAGE INCIDENTS

Lightweight batteries with high energy density have become commonplace in everyday life, powering toys, personal, and household electronics as well as electric bikes, scooters, and vehicles. These batteries are often made using lithium-ion or similar battery chemistries that can pose significant public safety risks. Physical, thermal, or electrical damage to these batteries can cause “thermal runaway” reactions that can quickly lead to explosions and fires that, because of their speed and temperature, are difficult to suppress and extinguish. Damaged batteries may keep some remaining energy, known as “stranded energy,” even after going into thermal runaway. This lingering energy can potentially reignite hours, days, or even weeks after the initial fire was put out.

As energy innovation expands, the widespread adoption of high energy density batteries continues apace in both residential and commercial spaces. This trend amplifies the challenges faced by responders in saving lives and protecting property as they respond to battery fire incidents.

LEVERAGING RESEARCH AND DEVELOPMENT, TEST, AND EVALUATION TO SUPPORT RESPONDERS

The [National Urban Security Technology Laboratory \(NUSTL\)](https://www.dhs.gov/nustl) under the Department of Homeland Security (DHS) Science and Technology Directorate (S&T) is leading research and development (R&D) and test and evaluation (T&E) activities to address emerging hazards associated with energy storage. NUSTL established the Energy Innovation and Public Safety (EIPS) program to provide first responders with insights and techniques for effective response to battery fires as well as information on the health and safety impacts to themselves and the public.

The guidance that results from these research and testing activities will help public safety agencies understand and plan for the full lifecycle of current and new energy innovations. This may include physical and cyber hardening, infrastructure siting, removal of damaged batteries, and more. An overarching goal of this work is to ensure public safety considerations are woven into the fabric of new battery - and other energy-related R&D going forward.



INITIAL ACTIVITIES UNDER THE EIPS PROGRAM

- Developing a T&E framework that considers battery chemistries, designs, and extinguishment solutions and techniques
- Running targeted test efforts resulting in science-based guidance for first responders
- Publishing a roadmap for researching health and safety impacts to responders and the public, including off gases and ramifications for personal protective equipment during and after a response
- Creating a centralized knowledge repository that enables researchers, industry, and responders to locate and identify important information and conduct further research
- Hosting a workshop to bring together stakeholders and subject matter experts to develop action plans for key topics where additional R&D and T&E may be well suited

ENGAGING WITH NUSTL

EIPS stakeholders span the first responder and public safety community, government and non-profit agencies, research organizations and academia, private industry, and others to ensure a collaborative research agenda. Through stakeholder engagement, landscape analysis, technology scouting, and forward-leaning R&D, DHS S&T NUSTL hopes to advance public safety considerations in future energy innovations. To engage with the EIPS program, please contact NUSTL@hq.dhs.gov.