TITLE OPERATIONS MANUAL	STANDARD INSTRUCTION 02		DEPARTMENT FIRE-RESCUE
SUBJECT BATTERY ENERGY STORAGE SYSTEM FAILURES	**SECTION** 49	**PAGE** 1 of 2	**EFFECTIVE DATE** November 15, 2023

I. PURPOSE

To establish operational guidelines for effective response, mitigation, and safe operating procedures for battery energy storage systems.

II. SCOPE

This policy shall apply to all sworn San Diego Fire-Rescue Department (SDFD) personnel, excluding Lifeguard personnel.

III. AUTHORITY

The Fire Chief authorizes this policy.

IV. POLICY

A. Personal Protective Equipment (PPE)

1. Wear self-contained breathing apparatus (SCBA)
2. Wear structural firefighting gear

B. Signs of possible *Battery Energy Storage System (BESS)* failure:

1. Smoke or suspicious odor emanating from an Energy Storage System can be an indication of an abnormal and hazardous condition
2. *Battery thermal runaway* fires are preceded by smoke
3. **The battery may not generate visible signs of a thermal event although the event can still be active, and the battery can flare up**

C. If fire, smoke, or a suspicious odor is observed emanating from the product at any time, perform the following:

1. A defensive strategy should be utilized
2. If possible and safe to do so, shut off the emergency switch
3. Evacuate the area of all non-emergency personnel
4. Do not approach the unit and attempt to open any doors. A BESS has a variety of safety mechanisms. Some are designed to maintain the doors shut, and some have automatic doors designed to aid in ventilation
5. If not already done, contact the site emergency contact and/or manufacturer
6. Maintain a safe distance from the unit and monitor for evidence of continued smoke venting or fire
7. Complete an area size-up and establish a water supply

8. If a fire has not developed:
    i. Position attack lines to protect neighboring exposures and neighboring battery enclosures
    ii. Do not apply water (no cooling measures)
9. If a fire develops:
    i. Allow the affected unit to consume itself as it is designed to do. Applying water to the burning unit will only slow its inevitable combustion
    ii. Use a wide-fog stream at the lowest volume possible to achieve the desired cooling of **neighboring** battery enclosures. Coordinate procedure with site emergency contact or product manufacturer
10. Allow the battery pack to cool down (this process may take 12-48 hours or longer)

V. DEFINITIONS

A. Battery Energy Storage System (BESS): Battery Energy Storage Systems, or BESS, are rechargeable batteries that can store energy from different sources and discharge it when needed. BESS consists of one or more batteries. RETURN

B. Thermal Runaway: Lithium-ion (Li-ion) battery thermal runaway occurs when a cell, or area within the cell, achieves elevated temperatures due to thermal damage, mechanical damage, internal/external short-circuiting, or electrochemical abuse. This elevated temperature releases energy which in turn further increases the temperature. It is a phenomenon known as a positive feedback loop in which the lithium-ion cell enters an uncontrollable, self-heating state. RETURN