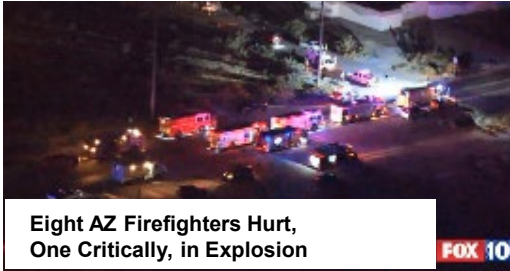


Energy Storage Safety Monitor

June 2020

Recent lithium-ion battery storage fire incidents



Eight AZ Firefighters Hurt, One Critically, in Explosion



Photo: Fox News

Arizona 2MW / 2MWh Energy Storage Facility, USA April 2019

“The McMicken disaster unfolded in two distinct but related events. First, a single battery rack caught fire and burned — an occurrence that battery engineers refer to as thermal runaway. Second, an explosion rocked the enclosure when first responders opened the door.

The parties have not released the cause of the fire, but they quickly identified where it occurred: one particular rack, containing 14 battery modules. The monitoring systems detected a voltage drop across those modules, followed by an increase in temperature.” ---[Greentech Media](#)



Photo: Korea Fire Department, chuneng.bjx.com

Chungnam Solar Station, South Korea August 2019

“[T]he system caught fire two days after increasing the state-of-charge to 95% from 70%. The cause of the fire is not yet clear, but the battery supplier, LG Chem Ltd., requested all storage sites equipped with their batteries lower the SOC back to 70%.” ---[Bloomberg New Energy Finance](#)



Photo: Korea Fire Department, nengyuenjie.net

Gangwon Pyeongchang 40MW / 21MWh, South Korea September 2019

Investigators cited erroneous charging and discharging processes as the cause of the fires. “[T]he product’s energy management system revealed that the power voltage rose above the maximum level set for charging and fell below the minimum level for discharging. The battery protection didn’t work, leading to the fire, the panel said.”---[Korea Herald](#)

As of
June 2020:

31
fire incidents
since 2017

2 GWh
affected

Source: BloombergNEF



Fire-hazards not limited to stationary energy storage



Photo: li-b.cn

Electric Bus Explosion, China August 2018

An electric bus exploded while in a tunnel in eastern China due to a battery fault.

Source: <https://www.newsflare.com/video/234049/crime-accidents/battery-fault-causes-electric-bus-to-explode-in-chinese-tunnel>



Photo: City of Bergen Fire Department

Battery Fire on Diesel-Electric Passenger Ferry, Norway October 2019

Norwegian authorities are warning ship-owners and operators about the dangers associated with lithium-ion battery systems after a fire and subsequent gas explosion on board a diesel-electric ferry in Norway.

Source: <https://www.iims.org.uk/norwegian-maritime-authority-issues-warning-about-lithium-ion-power-following-ferry-fire-and-explosion/>

Lithium-ion battery storage fire incidents

| Project | Country | MW | MWh | Application | Incident Date |
|---|---------|-----|------|----------------------|---------------|
| APS Flagstaff Energy Storage Project | USA | 1.5 | - | Peak management | Dec-12 |
| MOTIE Gochang Energy Storage Pilot Project | Korea | 2 | 4 | RE integration | Aug-17 |
| KEPCO Gyeongsan Energy Storage Project Phase II | Korea | 24 | 8.6 | Frequency regulation | May-18 |
| CNPV Power Korea Gunsan Saemangeum Energy Storage Project | Korea | - | 19 | RE integration | Jun-18 |
| DaeMyoung GEC Yeongam Energy Storage Project | Korea | 4 | 15 | RE integration | Jun-18 |
| Asia Paper Sejong Energy Storage Project | Korea | - | 18 | Peak management | Jul-18 |
| DaeMyoung GEC Geochang Energy Storage Project | Korea | 9.6 | 9.6 | RE integration | Jul-18 |
| Haenam Songji Energy Storage Project | Korea | - | 3 | RE integration | Jul-18 |
| Jiangsu Grid-side ESS Substation (LFP Battery) | China | 1.7 | - | Peak management | Aug-18 |
| KEPCO Jeju Energy Storage Project | Korea | - | 0.18 | RE integration | Sep-18 |
| Taeon Energy Storage Project | Korea | - | 6 | RE integration | Sep-18 |
| Yeongdong Energy Storage Project | Korea | - | 6 | RE integration | Sep-18 |
| KEPCO Shin-Yongin Energy Storage 24 Project | Korea | 24 | 18 | Frequency regulation | Oct-18 |
| Mirae Solar Energy Mungyeong Energy Storage Project | Korea | - | - | RE integration | Nov-18 |
| Cheonan Dongnam Energy Storage Project | Korea | - | - | RE integration | Nov-18 |
| Gwanghyun Yeongju Energy Storage Project | Korea | - | - | RE integration | Nov-18 |
| Gangwon Samcheok Energy Storage Project | Korea | - | - | RE integration | Dec-18 |
| Asia Cement Jecheon Energy Storage Project | Korea | 1.6 | 9.3 | Peak management | Dec-18 |
| Daesung Industrial Gases Ulsan Energy Storage Project | Korea | 10 | 46.7 | Peak management | Jan-19 |
| Jangsu Energy Storage Project | Korea | - | - | RE integration | Jan-19 |
| KISWIRE Yangsan factory Energy Storage Project Phase I | Korea | 0.5 | 3.3 | Peak management | Jan-19 |
| Wando Shinji Energy Storage Project | Korea | - | - | RE integration | Jan-19 |
| APS McMicken Energy Storage | USA | 2 | 2 | RE integration | Apr-19 |
| Chungnam Solar Station | Korea | - | - | RE integration | Aug-19 |
| Gangwon Pyeongchang Wind Farm | Korea | 40 | 21 | RE integration | Sep-19 |
| Haenam PV+ ESS facility | Korea | - | 1842 | RE integration | May-20 |

Source: BloombergNEF, Greentech Media, chuneng.bjx.com

Note: Details of some fire incidents in Q4 2019 are not readily available.



Additional Resources

Regulator says lithium-ion batteries create “unacceptable risks”

<https://pv-magazine-usa.com/2019/08/08/lithium-ion-not-prudent-and-create-unacceptable-risks/>

The Arizona Battery Explosion Is Changing Conventional Wisdom on Safety

<https://www.greentechmedia.com/articles/read/arizona-battery-explosion-conventional-wisdom-safety>

US National Fire Protection Association (NPA) 855: Standard for the Installation of Stationary Energy Storage Systems

<https://www.nfpa.org/codes-and-standards/all-codes-and-standards/list-of-codes-and-standards/detail?code=855>

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