

## Current Requirements Already In Place for Customer Sited Energy Storage Project Safety

### Regarding larger commercial/industrial applications:

Owners are now required to notify the local fire department of the size, type, and location of an energy storage system, if indirectly. Normally, this notification would occur through permitting requirements that would trigger notification of the appropriate emergency response agencies upon completion of installation and before start-up. Most jurisdictions have a process whereby the fire department is included in any permitting process for building permit approval that involves hazardous materials. The IBC and NFPA-70 have specific requirements for storage and handling of hazardous materials and specifically for battery energy storage systems. These codes also address proximity to other hazardous materials and combustible objects. Technology is moving faster than the codes, but the right questions should be triggered by the permitting process, with the jurisdiction having authority (JHA) asking questions of the owner/technology provider. Some education of the JHA is likely in most locations.

First responders will need to know the type and specifics of energy storage systems on site - appropriate response depends on the chemicals present and the physical form. The appropriate responses would each be very different for an emergency involving a system using bromine chemistry compared with a system using lead-acid, lithium ion, sodium sulfur, or even fly-wheel storage. Future revisions of NFPA-70 will likely require specific labeling and signage of some sort.

Utilities have policies and practices for connecting distributed energy resources to the grid that would apply in the case of energy storage systems that may back-feed the grid (as would apply to residential storage, and residential PV). They also have policies and requirements with respect to disconnecting means and utility access to those disconnecting means. Such means is accessible to fire departments directly at external service panels or through the utility feeder.

Relocation or removal of storage would be addressed as above through the building permit and interconnect processes of the JHA and utility, respectively.

Recycling, training, installation qualifications, etc. are all areas that might benefit from direct PUC involvement, as these are not covered in any existing requirements that we are aware of.

### Regarding Residential/Small Commercial Applications

Before any energy storage products are sold, they are subject to regulatory and safety oversight. For example, in the case of small distributed behind the meter battery systems, the battery pack and power electronics are UL listed for safety and functionality. This is already required in order to meet IOU Rule 21 and local permitting authority requirements. Systems are also warranted for 10 years, which is

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backed by the battery manufacturer’s 10 year product warranty. This is also a requirement under the Self Generation Incentive program.

Many of the concerns raised focus on issues that are already addressed by local permitting authorities based on California Title 24 Building, Fire and Electrical Codes. Under Rule 21 small distributed behind the meter energy storage systems are required to submit the final, signed building permit to the utility as part of the interconnection process. Furthermore, most of the local permitting authorities involved in deploying energy storage systems require most if not all of the following clear signage for first response personnel:

1. A placard at the main meter alerting to the presence of a PV and storage system and showing the location of both systems.
2. As with solar PV, clear waterproof signage that is permanently affixed near the AC disconnect to indicate the presence of a battery/energy storage system that may remain active if the grid AC is disconnected.
3. A label in the main panel showing the breaker for the paired PV and battery system
4. A label in the critical load panel showing the tie in of the PV system
5. A label on the DC disconnect of the battery
6. Built-in disconnect ‘kill’ switch directly on the front panel of the battery pack. When this switch is off, no power can come out of the battery. This disconnect ‘kill’ switch is already required by the National Electrical Code for all battery systems.
7. Redundant protection can also be provided by placing an additional energy storage ‘kill’ switch in the critical load panel next to the battery and/or near the main AC disconnect, with clear signage labeling it as “Battery Disable Switch”. Basically, the idea is to disable the energy storage system’s DC to AC functions. This will cease the export or generation of a reference AC source from the battery power electronics. The storage system would not be able to be re-engaged/function unless this “Battery Disable Switch” was in the “ON” position. This can either be a software controlled switch or a hard switch on any controls on the contactors for the DC portion.
8. Owners/Operators are required to notify the local fire department of the size, type and location and site address where storage systems are located depending on local fire code requirements in terms of the quantity of energy storage materials and the fire safety requirements of the materials in question. Locally posted signage should indicate this with a permanently affixed waterproof (etched) map of the premise showing key device locations and disconnect procedures. Further, any outlets or AC connection points supported by the energy storage system should be clearly identified by the color of the outlet and signage indicating “Protected power may be live if main premise AC is disconnected”.

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