Scott Lang, Senior Industry Affairs Manager
On behalf of Honeywell International
3825 Ohio Avenue
St. Charles, IL 60174

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Though both the 2018 International Fire Code and 2018 NFPA 1 Fire Code received significant enhancements to provide necessary protection levels which were improved further with the provisions of the 2020 NFPA 855 Energy Storage Systems, the 2021 International Fire Code and the 2021 NFPA 1 Fire Code, there are numerous existing installations that do not meet the new and necessary safety requirements. Even after the printing of the 2018 International Fire Code, installers continued to install systems that did not meet the new standard of care, taking advantage of earlier editions of the codes that were still being enforced locally. A glaring example of a system that did not meet the requirements of the 2018 or 2021 editions of the International Fire Code was in Surprise, Arizona where a thermal runaway event seriously injured 4 members of the fire service.

The purpose of this testimony is to request that Washington state start to address potential protection shortcomings in the design, installation and maintenance of existing energy storage systems employing lithium-ion battery technology by requiring that a hazard analysis conforming to the current requirements of IFC Sections 1207.1.4.1 and 1207.1.4.2 be conducted. These new requirements for existing ESS can be found in Chapter 11 of the upcoming 2024 edition of the International Fire Code.

2024 IFC Section 1107.1 sets the scoping to those systems installed prior to the local adoption of the 2018 IFC or later that exceed the thresholds in Table 1207.1.1 which is the trigger for new installations. It utilizes similar language for the hazard analysis as currently exists for new systems at 1207.1.4 for consistency in application. An exception for one- and two-family dwellings and townhouses is included.

2024 IFC Section 1107.1.1, in addition to the requirements of Sections 1207.1.4.1 and 1207.1.4.2, requires the inclusion of an assessment of the ability of the installed protection to provide an early warning of a thermal runaway event and to provide notification of that event in relation to the ability of responders to safely mitigate the event. Early detection of a thermal runaway utilizing listed methods of early detection, such as sensing cell off-gassing or other compliant methods, is essential to mitigation efforts and the safety of responders.

Finally, 2024 IFC Section 1107.1.2 requires the submission of a corrective action plan for the review and approval of the fire code official that includes actions and system improvements necessary for eliminating or mitigating identified hazards.

This “retroactive” provision is also consistent with the 2023 edition of NFPA 855 for Energy Storage Systems. Text from the 2024 IFC is included below.

Thank you for the opportunity to provide this testimony.

## 1107 Energy Storage Systems

**1107.1 Lithium-ion technology energy storage systems.**
The owner of an energy storage system (ESS) utilizing lithium-ion battery technology having capacities exceeding the values in Table 1207.1.1 and that was installed prior to the jurisdiction's adoption of the 2018 or later edition of the International Fire Code shall provide the fire code official a failure modes and effects analysis (FMEA) or other approved hazard mitigation analysis in accordance with Section 104.8.2 for review and approval.

Exception: Detached one- and two-family dwellings and townhouses

**1107.1.1 Early Detection.**
In addition to the requirements of Section 1207.1.4.1 and 1207.1.4.2, the analysis shall include an assessment of the ability of the installed protection systems to provide for early detection and notification of a thermal runaway event in relation to the ability of emergency responders to safely mitigate the size and impact of a thermal runaway event.

**1107.1.2 Corrective action plan.**
Where hazards are identified by the analysis, a plan that includes a timetable for corrective action shall be submitted to the fire code official for review and approval. The plan shall include actions and system improvements necessary for eliminating or mitigating any identified hazards, including listed methods for early detection and notification of a thermal runaway event.