



Battery Management System Standards

David Rosewater
(working group chair)



Scope / Purpose

Scope:

This recommended practice includes information on the design, configuration, and interoperability of battery management systems in stationary applications. This document considers the battery management system to be a functionally distinct component of a battery energy storage system that includes active functions necessary to protect the battery from modes of operation that could impact its safety or longevity.

This document covers battery management technologies, configuration by application and battery type, and interoperability with other systems. Technologies include battery management peripheral devices and subsystems, balancing methods, sensor types and placement, physical and software architectures, and battery management functions. Configuration includes both grid-supporting and non-grid-supporting applications and specific recommendations for the following battery types: lithium-ion, flow, sodium-beta, and alkaline zinc-manganese. General recommendations applicable to other battery types are provided. Interoperability recommendations include guidance such as minimum measurement accuracy and state-of-charge reporting standards, communications including information models and error reporting, and cybersecurity including access control and software update management best practices.

Transportable energy storage systems that are stationary during operation are included in this standard. This document does not cover battery management systems for mobile applications such as electric vehicles; nor does it include operation in vehicle-to-grid applications. Energy storage management systems (ESMS), which control the dispatch of power and energy to and from the grid, are not covered.

Purpose

Well-designed battery management is critical for the safety and longevity of batteries in stationary applications. This document aims to establish best practices in the design, configuration, and integration of battery management systems used in energy storage applications.

IEEE P2686 Recommended Practice for Battery Management Systems in Stationary Energy Storage Applications

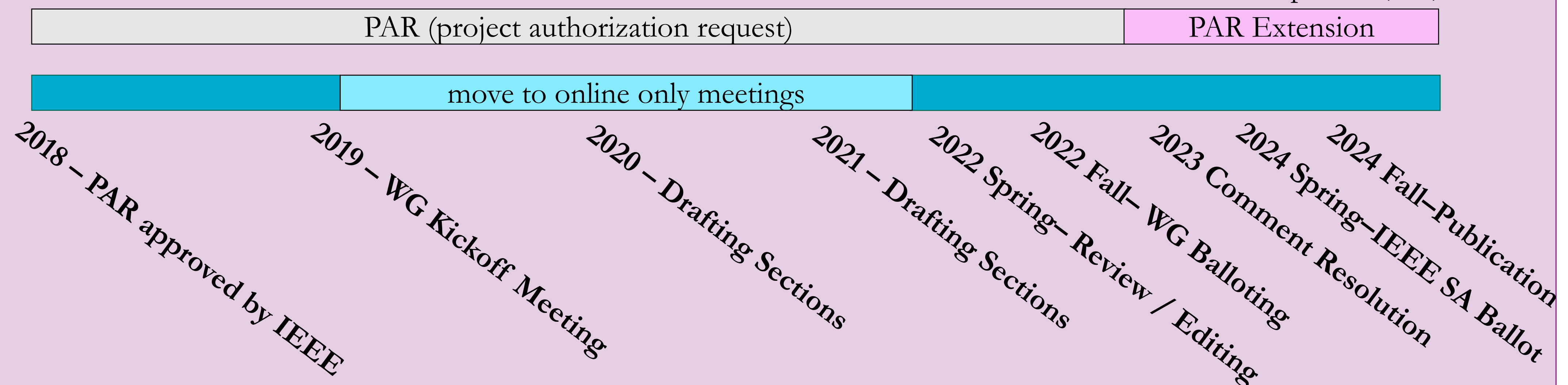
SA BALLOT COMPLETED IN FEBRUARY 2024 : 94% APPROVAL

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P2686 DEVELOPMENT TIMELINE

Intent is for a 3-year revision cycle

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Abstract

This document includes information and recommendations on the design, configuration, and interoperability of battery management systems in stationary applications. It considers the battery management system to be a functionally distinct component of a battery energy storage system that includes active functions necessary to protect the battery from modes of operation that could impact its safety or longevity. It provides recommendations on how to configure a battery management system to protect a given battery type in each application environment. Lastly, it stipulates recommended communication structures and data models that help support interoperability and cybersecurity. The result is a comprehensive list of best practices around the design and integration of battery management systems that protect the safety and longevity of batteries in energy storage applications.

Contents

1. **Overview**
 - 1.1 Scope
 - 1.2 Purpose
 - 1.3 Word usage
 2. **Definitions, acronyms, and abbreviations**
 - 2.1 Definitions
 - 2.2 Acronyms and abbreviations
 3. **Battery management fundamentals**
 - 3.1 General
 - 3.2 Cell Safety
 - 3.3 Cell Longevity
 - 3.4 BMS-ESMS interaction
 - 3.5 BMS Design and/or Integration Process
 4. **Hardware, software, devices, and functions**
 - 4.1 General
 - 4.2 Battery management devices and systems
 - 4.3 Physical architecture
 - 4.4 Software architecture
 - 4.5 Battery management functions
 - 4.6 Interactions with power conversion systems
 5. **Battery management configuration**
 - 5.1 General
 - 5.2 Configuration by application
 - 5.3 Configuration by battery type
 - 5.4 Qualification
 6. **Communications and interoperability**
 - 6.1 General
 - 6.2 BMS information functions
 - 6.3 General information and control bus
 - 6.4 Diagnostic information and reconfiguration bus
 - 6.5 Cybersecurity
- Annex A (normative) **BMS ESMS Overlap**
 Annex B (informative) **Balancing circuit calculations**
 Annex C (informative) **Digital twins**
 Annex D (informative) **Example error, warning, and fault codes and descriptions**
 Annex C (informative) **Bibliography**

If you have knowledge of BMS design and would like to participate in the development of a new IEEE recommended practice, then please contact the working group chair, David Rosewater dmrose@sandia.gov, and join us for the next digital working group meeting.

The IEEE P2686 working group has spent six years meticulously writing and reviewing guidance for battery management systems in energy storage applications. The result is a nearly comprehensive set of recommendations for what BMS functions should be applied to a given battery type in a given application. This standard will streamline BMS design and integration, reduce system costs, and improve overall reliability of the BESS needed for the energy transition.



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