

Testing of Lead Batteries for Long Duration Applications

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PROJECT PROFILE

Topic: Lead Batteries Vertical: Safety & Reliability
Strategic Pathway: Grid Energy Storage
Project start and finish: FY26-FY28

PROBLEM

Lead batteries are a mature, recyclable, and widely deployed energy storage technology, but it is not yet well understood how they can be configured and improved for long duration energy storage (LDES) applications on the electric grid. Our objectives are first collecting performance and degradation data that will help improve the technology for LDES applications and second to provide cycled samples that will be tested by other teams to determine degradation mechanisms. To accomplish this the Consortium for Lead Battery Leadership in LDES has assembled teams from Battery Council International, PNNL, Argonne, Oak Ridge, Advanced Battery Concepts, C&D Trojan, Clarios, Crown, East Penn Manufacturing, EnerSys, Gridential, Stryten, and The Consortium for Battery Innovation.

APPROACH

In the Battery Reliability Test Lab at the Grid Storage Launchpad, we are testing industry provided samples to a standard test profile. We are performing a 10hr peak shaving test with periodic reference performance test.

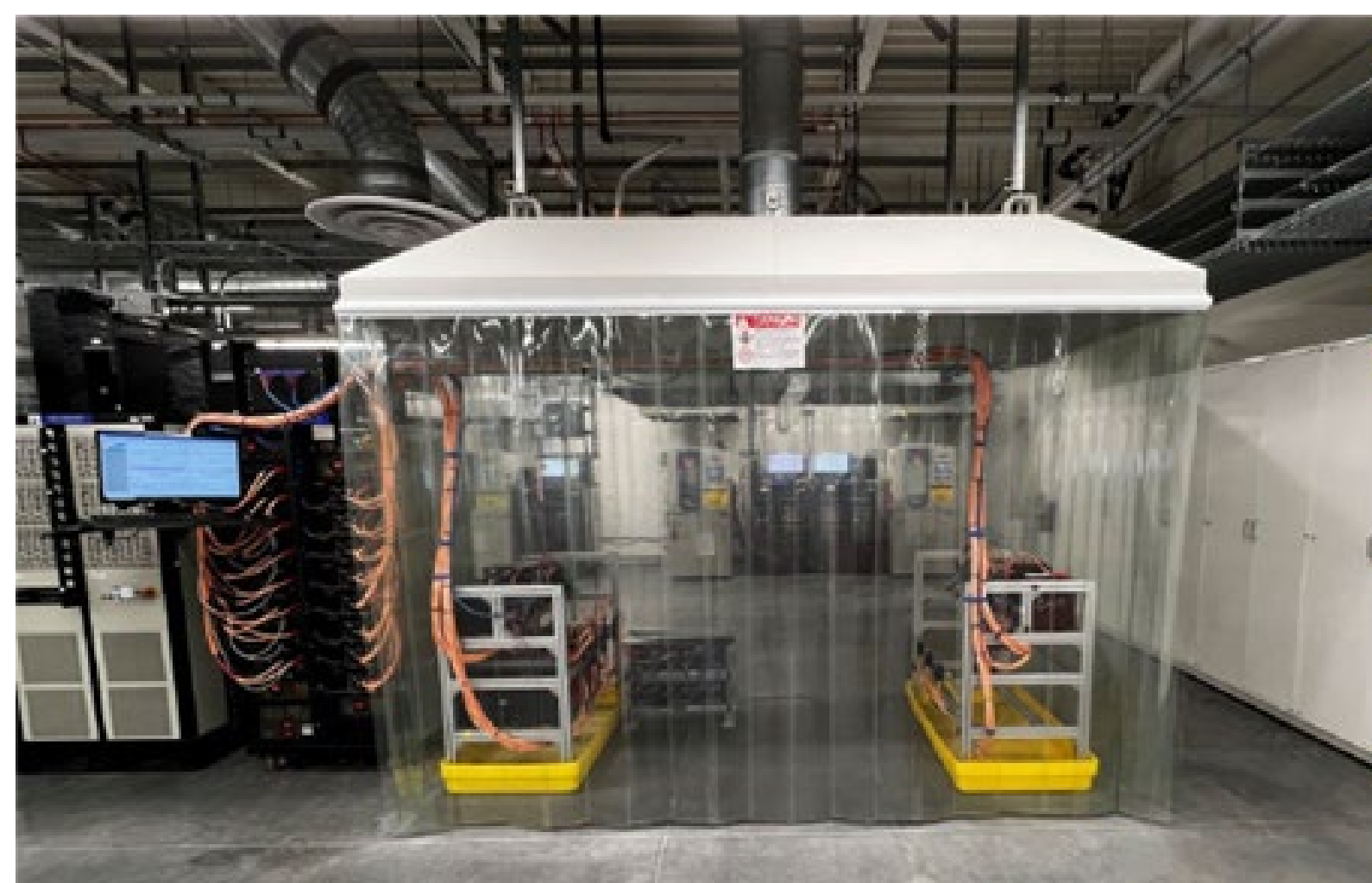
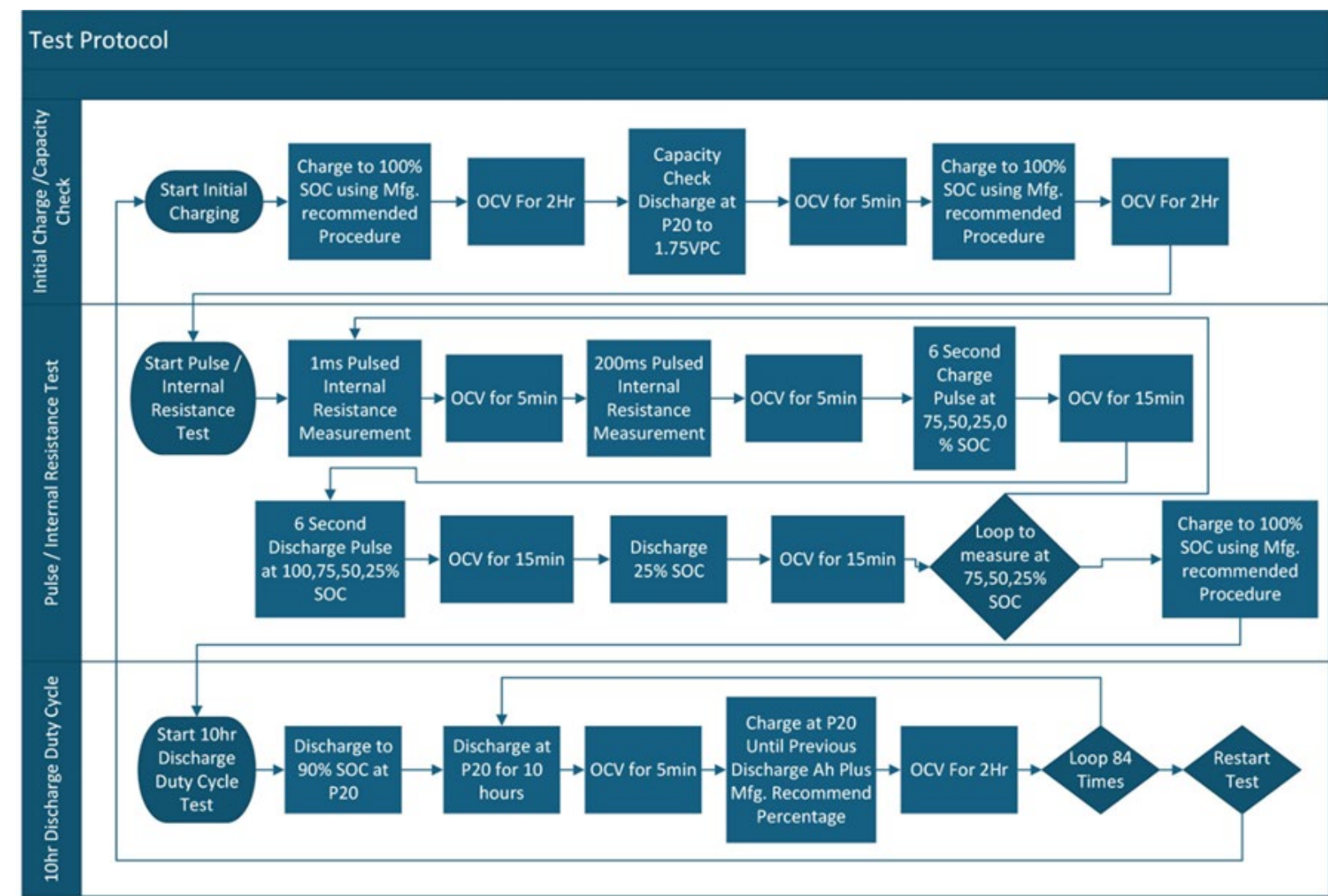


Fig. 2. Batteries on test at GSL.

RESULTS

The first round of samples has been subjected to the cycling protocol. Some of the samples have reached end of life and are being analyzed.

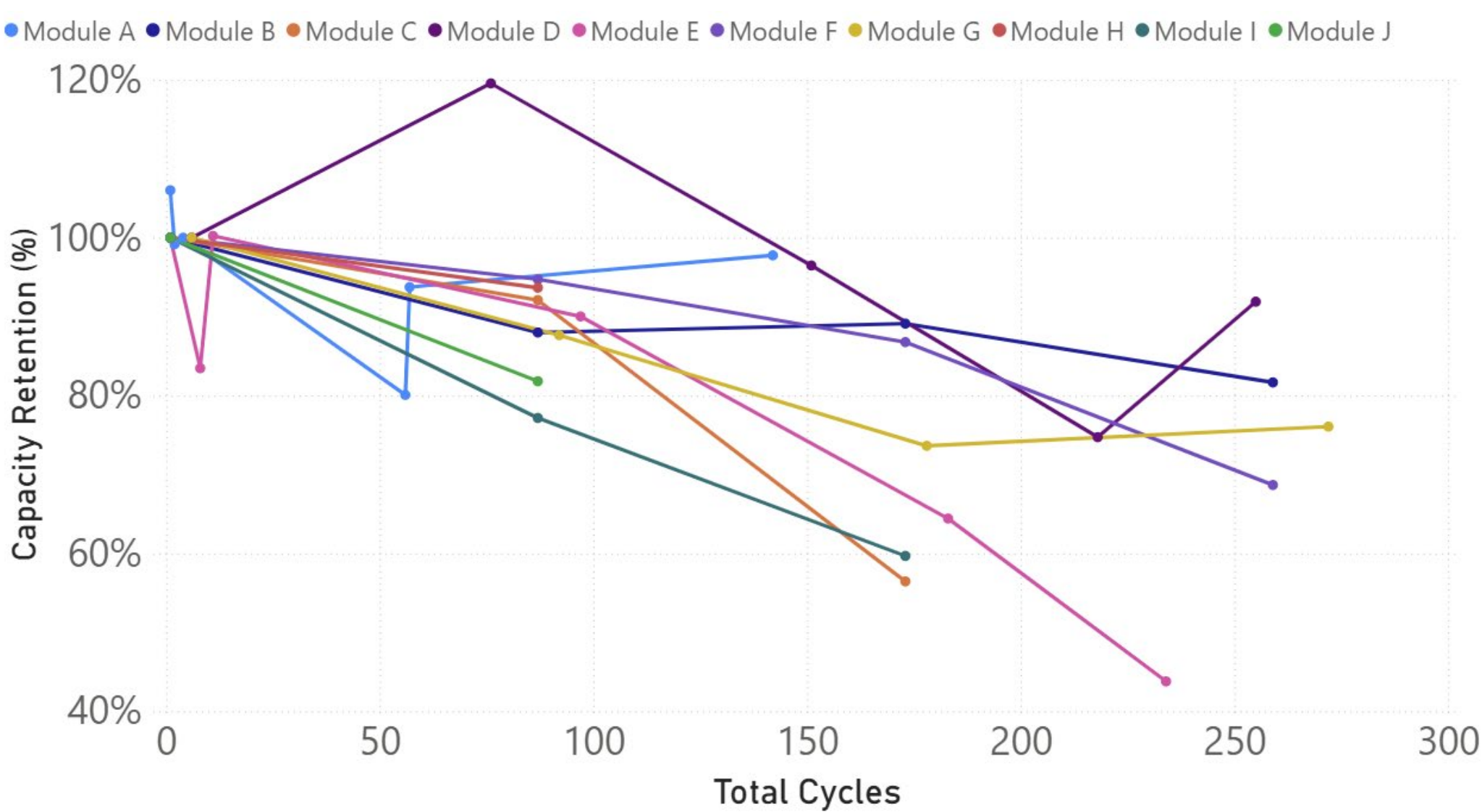


Fig. 3. Capacity retention vs total cycles.

CONCLUSIONS & IMPACT

We have gained insight into lead battery performance and degradation for this application. We have learned ways to improve cycle life by adjusting the cycling window to better suit the chemistry.

FUTURE DIRECTIONS

We will develop models to help forecast cycle life. We will continue cycling samples under an improved protocol to determine performance and cycle life.

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