Astrolabe Analytics Inc.
Battery Predictive Maintenance

NCMS Technology Showcase
Puget Sound Naval Shipyard

PROBLEM STATEMENT

• The DoD has a need for low-cost, autonomous delivery vehicles for all missions and terrain, be it land, marine, or air.
• Regardless of the application or platform (EVTOLs for the Air Force, ground vehicles for the Army, or UUVs for the Navy), Li-ion batteries will play a role as the primary or auxiliary power source. These are demanding applications where the battery will be pushed to its limits.
• Vehicle operators and maintenance organizations must know how much longer the battery will be able to perform, both for the current mission and for future sustainment.
• Astrolabe has developed methods for forecasting battery health and performance in electric aircraft that can be applied to related platforms across the DoD.

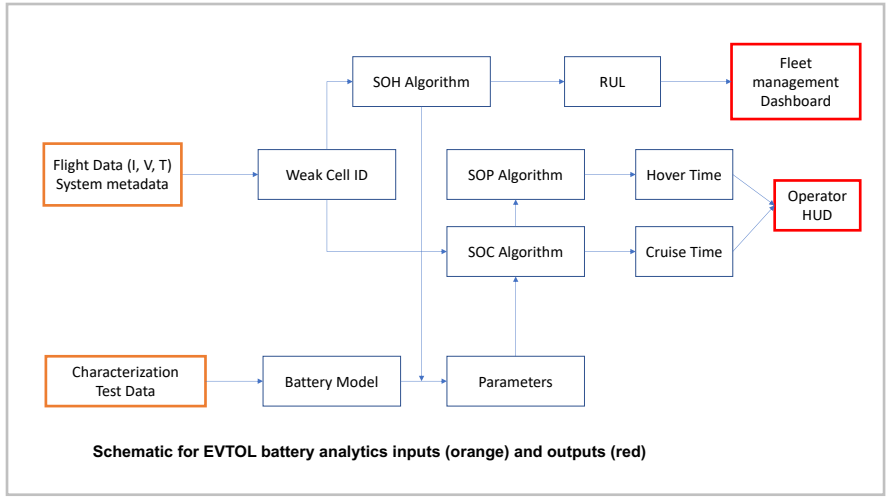
BENEFITS

• Platform design phase: Develop certification bases and standard operating procedures around battery systems safety and performance for autonomous vehicles (including land, air and marine)
• Operations phase: Analytics can be extended to help monitor performance of other battery-powered systems to improve key metrics like:
– Reducing maintenance hours
– Reducing battery replacement costs
– Ensuring system safety and uptime

TECHNOLOGY SOLUTION

â€¢ Our machine learning methods enable state-of-the-art lifetime prediction across different scenarios:
â€“ Temperature ranges
â€“ Load profiles
â€“ Battery chemistries
â€¢ We have patent-pending methods for online and offline health monitoring of EVTOL battery packs developed under a USAF SBIR Phase 2 contract
â€¢ Battery forecasts can in turn be used across the product lifecycle to inform warranty design, quality control, field operations, and end-of-life retirement.

GRAPHIC



Schematic for EVTOL battery analytics inputs (orange) and outputs (red)