



**MPSC**  
MILITARY POWER  
SOURCES CONSORTIUM



astrolabe  
analytics

## Advancing DoD Battery Maintenance and Sustainment

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MPSC Battery Maintenance Committee  
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# Problem

Batteries impact the **functional safety and economics** of electric hardware, vehicles, and devices.

But real-time battery maintenance is costly and impractical; we are **unable to answer basic questions:**

## Battery Performance

Is my battery able to **conduct its next mission?**

Is my battery ready to **power the next maneuver?**

## Battery Health & End-of-life

When is my battery **going to die?**

Is my battery **in danger of catching fire?**

# Consequences: High Cost and Danger



## Maintenance

Premature  
Retirement

Overbuy inventory

Added  
maintenance hours



## Field Operations

Vehicle loss

Unsafe for users,  
operators

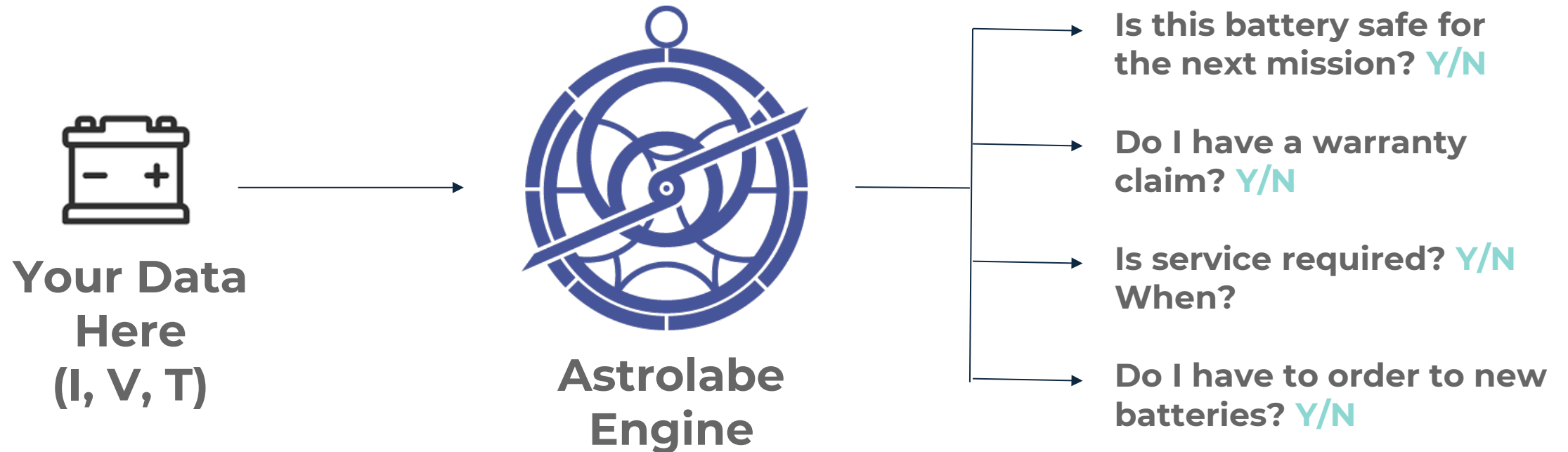
Jeopardize mission

Batteries  
catch on fire  
or die  
unexpectedly.

To avoid this, the  
**battery developers, operators, and maintainers**  
need the means to  
manage **battery performance**  
and inform **condition-based maintenance.**

# Astrolabe's Solution (one of many approaches)

Forecast battery health, safety, performance using data-driven machine learning and electrochemically-inspired models



Capabilities can be deployed **in the cloud**, as well as **embedded hardware**

# About Astrolabe



Established

**2018**

Based in  
Seattle, WA



## Facts

**Accelerating Electrification** by enabling batteries to go beyond using Data Driven Battery Health and Performance Modeling.



Multiple commercial projects pertaining to eVTOL, drone, and commercial & industrial assets

## Mission & Technology

\$2.3M in non-dilutive funding



## Funding

## Relevant Professional Memberships and Partners



Soteria Battery  
Innovation Group



Washington Cleantech  
Alliance



Vertical Flight Society



Military Power Sources  
Consortium



National Center for  
Manufacturing Sciences



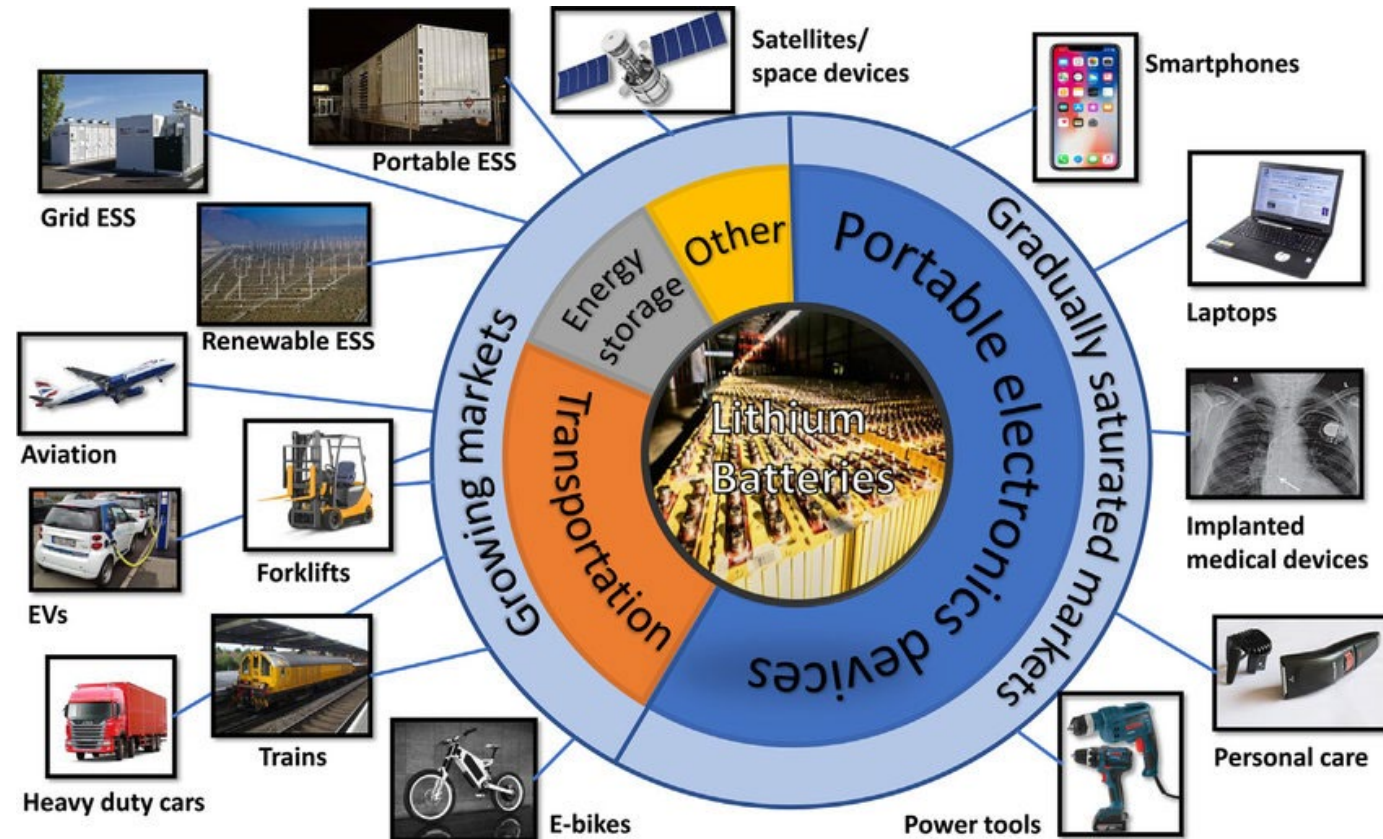
# Other solutions or best practices may serve different chemistries and use cases

## Use Cases / Platforms

- Drones / UxVs
- Ground Vehicles (6T)
- Shipboard batteries
- Aviation batteries (270V JSF)
- Soldier-portable power (STUB)
- Just about anything with a rechargeable battery

## Chemistry

- Li-ion
- Na-ion
- Li-S
- Silicon anode
- Li-metal
- Redox flow
- Lead acid
- Zinc, etc.



# MPSC Battery Maintenance Committee

**Purpose: Share best practices for battery maintenance across platforms**

- 1) Identify common maintenance issues and solutions in depots or fielded by the warfighter**
- 2) Assess opportunities for battery end-of-life recycling or repurposing**
- 3) Communicate results back to the consortium**

**Outcomes:**

- 1) Reduce battery maintenance and replacements costs**
- 2) Ensure high system safety and uptime**
- 3) Prevent mission failure**





# Committee Status - Formation



**Seeking interested DoD and MPSC commercial membership to establish cadence for early discussion and identify nearest-term opportunities for improvement.**

## **Chairperson**

Robert Masse ([robert@astrolabe-analytics.com](mailto:robert@astrolabe-analytics.com))

# Rough Path Forward



**Step 1: Identify key DOD stakeholders with relevant mission requirements to serve as core committee members** <- We are here

**Step 2: Advertise to wider MPSC membership for industry engagement**

**Step 3: Schedule kickoff meeting ~Fall 2024**

**Step 4: Establish meeting cadence + document baseline DOD battery maintenance SOPs**