

# Hybrid-Electric Integrated Systems Testbed (HEIST)

## System Description

### Performance

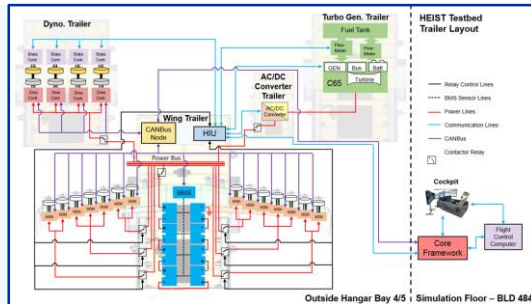
- Hybrid-electric propulsion
- Hardware-in-Loop & SIM
- 265-kW system
  - 200-kW batteries
  - 65-kW Capstone turbogenerator
- Aerodynamic feedback using dynamometers

### Safety / Reliability

- Emergency-Stop (E-stop) network
  - Capable of removing power from all sources (batteries or turbogenerator) and sinks (motors or dynamometers)
- Contactor relay network
  - Capable of removing power from any (one or more) sources and/or sinks
  - Emulate failures, degraded performance, and off-nominal conditions

### Functionality

- 4 Trailers (mobile test setup)
- Testing from SIM & Cockpit
- Test support station for added situational awareness



## Desired Research Outcomes

Embedded controllers/  
distributed intelligence  
*Motor, Generator, Turbine-Fuel, Batteries Controllers*

Pwr Train Command & Control loop

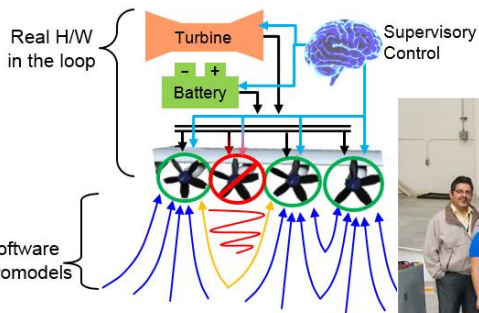
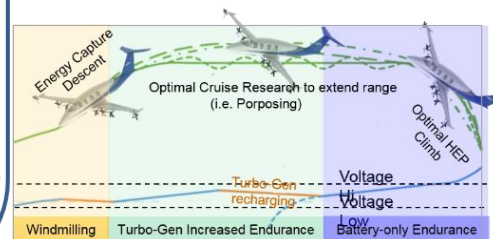
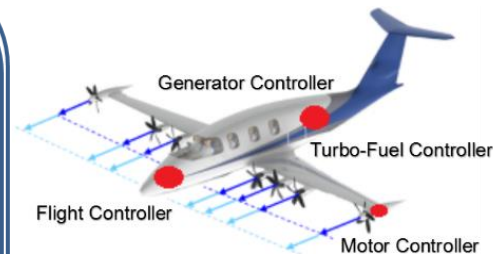
Improve Efficiency

Flight Maneuver Command & Control loop

Electric Motors Used as Control Effectors

Mission Command & Control loop

Recharge batteries w/ Turbo generator to extend range



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