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<tr>
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<th>c. THIS PAGE</th>
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**Advanced Propulsion**

**Challenges we have:**
- Safety and acceptance of high voltage architecture
- Cost of component development
- Availability of production vehicles with advanced propulsion systems
- Integration burden and current power electronics technology robustness

**Solutions we are investigating:**
- High voltage inline generators for onboard vehicle power (OBVP) on existing combat vehicles
- High temperature power electronics to lower the integration burden of advanced propulsion components
- Testing, Modeling and Simulation of propulsion and power electronics components
- Utilize prototype vehicles to demonstrate utility of full hybrid and OBVP technologies
- Partner with military users to evaluate capabilities offered by advanced propulsion enabled vehicles
- Reliability testing of vehicles to build confidence in the maturity of military hybrid electric

**Where we need your help:**
- Address high voltage safety in component and system designs
- Reduce cost through increased commercialization
- Collaboration for testing advanced propulsion systems in vehicle platforms.
- Further maturation of high temperature power electronics components
Projects
Current & Future

Vehicle Control Systems Roadmap
• SBIRs to develop high temperature passive components for power electronics
• SBIRs to develop high temperature solid state circuit breakers and gate drivers
• High temperature power electronics to support advanced propulsion systems
• High torque density and high power density electric motors for OBVP/ISG application operating at high temperatures (≥100°C)
• On-Board power generation to support increased military power demands and improve military mission effectiveness

Test and evaluation to mature components
1. Bench testing
2. System integration in full hybrid electric propulsion system
3. Vibration and high ambient temperature/in-vehicle

Vehicle Level Testing
1. Warfighter experiment to demonstrate and gain user feedback of advanced technologies
2. Military user assessment of a hybrid electric drive tactical vehicle
3. Demonstrate the Sentinel radar system without the need for a towed generator
4. Assess the reliability of the hybrid electric drivetrain on the RSTV in collaborative effort with GDLS
**Current Capability**

- The HERMIT allows integrated testing of HE components in a vehicle platform
- Cell 10 - electric machine and power electronics bench testing
- AV900 Power Supply
- Cell 10 Motor Dynamometer

**Future Capability**

- ISG Test stand for controls development
- Added capability to test and evaluate multiple electric machines and power electronic components

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**Laboratory Capability**

Current & Future

**GSPEL**

Ground Systems Power and Energy Laboratories

**Advanced Propulsion Roadmap**

- Hybrid Electric Reconfigurable Movable Integration Testbed (HERMIT)
- ISG test stand
- Cell 10 Motor Dynamometer
- GSPEL Motor Dynamometer

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