



# **FY 2019 OECIF Program**

## ***Service Priorities***

**July 18, 2016**

---



# Air Force Game-Changing Technologies

## •Autonomous Systems



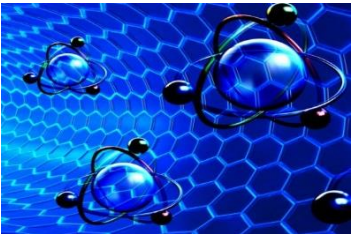
- **Manned/unmanned teaming in A2/AD environments**
- **Increased synchronized and integrated functions with other autonomous systems**
- **Optimized platform operations delivering integrated ISR and weapons effects**

## •Hypersonics



- **Defeat deep layered A2/AD structures**
- **Rapid strike from standoff for time critical targets**
- **Penetrating, persistent reusable ISR & strike**

## •Nanotechnology



- **Increased information capabilities**
- **Miniaturization of systems**
- **Reduction of \$/lb for launching payloads into space**
- **Increased functionality and autonomy**
- **Expected areas of impact: sensors, electronic devices, energetic materials, enhanced mechanical structures**

## •Unmanned Systems



- **Increased flexibility and capability in A2/AD environments**
- **Affordable and efficient to enable cost imposing effects**
- **Increase range, endurance, and performance**
- **Enables greater risk taking in highly contested environments**

## •Directed Energy



- **Sustain air dominance in 2030+**
- **Unlimited magazine**
- **Deliver temporary and reversible effects, offering more options to field commanders**
- **Reduces the need for acquiring and transporting large stockpiles of munitions to the theatre**



# Navy Integrated Research Areas

## • Amphibious Expeditionary Maneuver



- **Autonomy and man-unmanned teaming: ML/AI**
- **Flexible, scalable effects: Directed energy**
- **Expeditionary air systems: autonomous air-delivered logistics**

## • Information, Cyber, Spectrum Superiority



- **Assured Command and Control: Automated battlefield management tools**
- **Electromagnetic Maneuver Warfare**
- **Full Spectrum Cyber Technologies: DE/EW, power beaming**

## • Mission Capable, Persistent, Survivable Sea Platforms



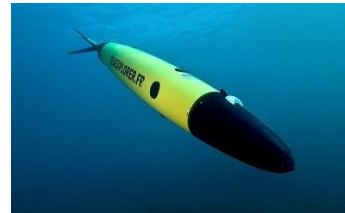
- **Mobility, Survivability: autonomous vehicles**
- **Power & Energy: Power generation, storage, controls, thermal management**
- **Platform design & sustainment: affordable fuel distribution**

## • Aviation, Force Projection, Integrated Defense



- **Directed energy and counter-DEW**
- **Aerodynamics**
- **Hypersonics**
- **Autonomy within the future hybrid force: Cross-Domain, Multi-Mission Human/Machine Teaming**

## • Undersea Battlespace & Maritime Domain Access



- **Arctic and global protection**
- **Rapid, autonomous neutralizing of mines**
- **Autonomous UUV ISR**

## • Warfighter Supremacy



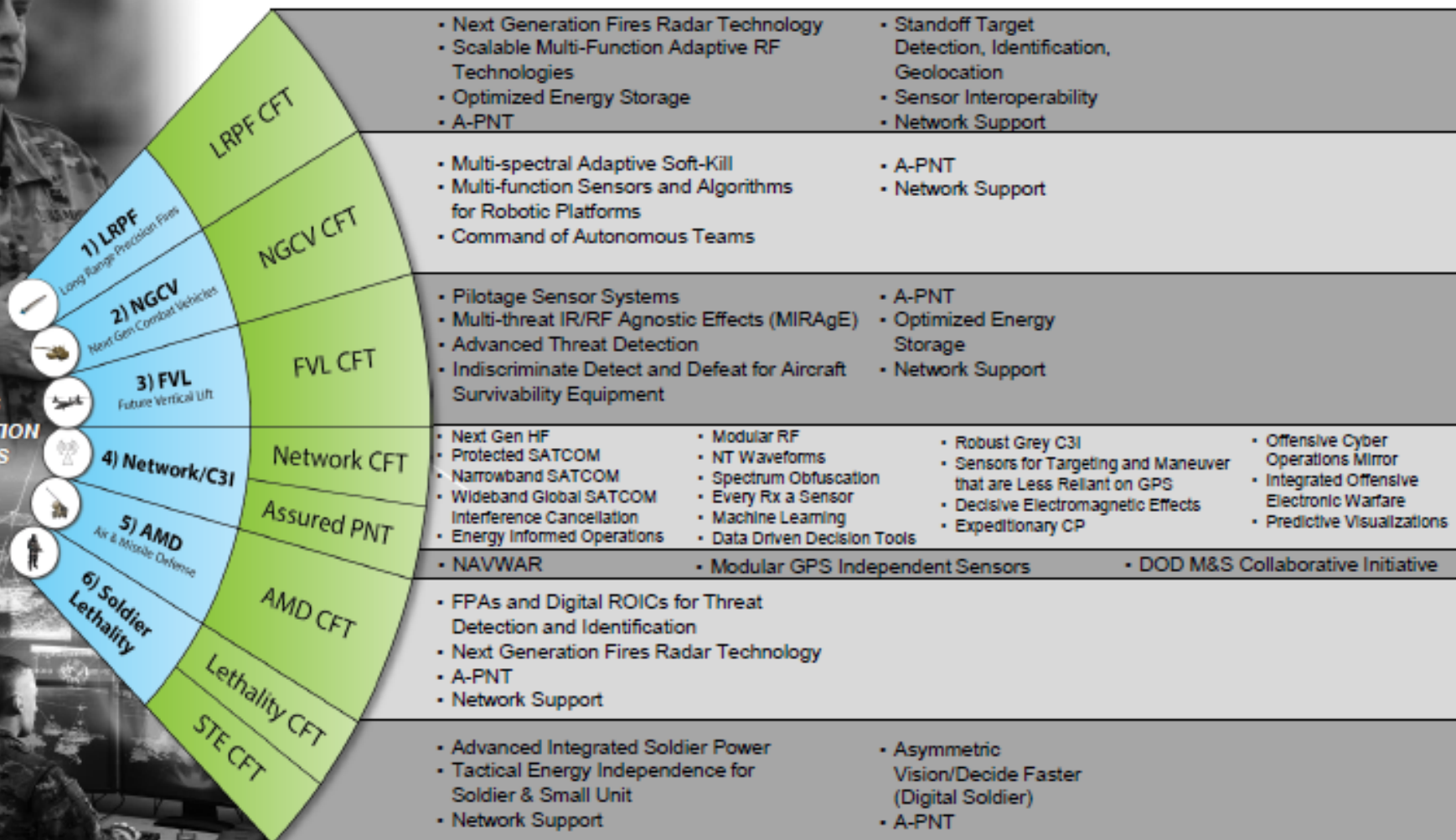
- **Advanced materials for lightweight body armor**
- **Biologically inspired sensors and autonomous systems**
- **Efficient training tools and techniques**



# RELATIONSHIP TO ARMY PRIORITIES



**ARMY'S 6  
MODERNIZATION  
PRIORITIES**





---

# Back Ups





# Navy Operational Energy Priorities

---

- Distributed logistics concepts that match distributed operations and do not add to increased manpower burdens for repair and refueling.
- Common families of high performance battery systems
- Power and Energy technologies that improve operational performance characteristics such as range, time on station, top speed, etc. without adding to logistical risks.
- Supporting HM&E (storage and controls) for high pulse power systems



# Air Force Operational Energy Priorities

---

- Turbine Engine Efficiency/Reliability/Maintainability
- Enabling Technologies for Next-Generation Mobility & Tanker Platforms
- Aircraft Drag Reduction
- Aircraft Power & Thermal Optimization (ex. advanced APUs, advanced system-cooling methods, and airframe-integrated solar power technologies)
- Hybrid Propulsion Systems (ex. Hybrid-Electric/Turboelectric, Hybrid-Liquid Natural Gas) & Ultra-Long Endurance Platforms (ex. High Lift/Drag air vehicles)



# Army Operational Energy Priorities

---

- High Efficiency Power Electronics to Reduced Thermal Load
- Modular Energy Storage Solutions and Control Architecture
- Hybrid Ultra-capacitor Energy Storage technologies to enable high pulse power aircraft survivability measures.
- Lightweight, compact power sources for enhanced Movement and Maneuver
- Expeditionary power generation for dismounted operations
- Advanced battery chemistries & formats that are integrated with distributed network devices
- Power generation & ruggedized fuel cells to enable increased mission duration
- Hybrid power energy solutions for obfuscation and decoy emitter technologies