

# Directed Energy Presentation to National Defense Industrial Association Emerging Technology Initiative

28 August 2023

Mark Neice, Director Emeritus

DISTRIBUTION A. Approved for public release: distribution unlimited





# What is Directed Energy?

- **Definition:** Technology and weapon systems based on the application of force on target with electromagnetic energy vice Kinetic Energy (KE) (no projectile)
- **Advantages**
  - Speed of light delivery
  - Precise engagement
  - Graduated effects
  - Depth of magazine
  - Low engagement cost
- **Energy Classes**
  - High Energy Laser (HEL)
  - High Power Microwave/Radio Frequency (HPM/HPRF)





# First Directed Energy Deployment



Navy Laser Weapon System (LaWS)  
Deployed on USS Ponce (ASB(I)-15)





# Boeing Compact Laser Weapon System - CLWS

- 5kW HEL system delivered for 2020 overseas field demonstration – Success!
- Tripod-mounted system, tied to a commercial laser source
- Can be palletized for mounting onto a pickup truck
- Eligible for HEL upgrade to improve range & performance





# Raytheon High Energy Laser Weapon System

- 10kW HEL mounted onto a Razor ATV
- 3 Systems delivered to AFRL for OCONUS field demonstration
- 4<sup>th</sup> system a palletized version mounted to a pickup truck
- Demonstrated capability against Class 1&2 drones



# Air Force Tactical High Power Operational Responder - THOR



- High Power Radio Frequency system that disrupts electronic signals
- Non-kinetic defeat of multiple targets simultaneously
- 20' container transportable via C-130
- 2021 Best of Defense award winner



# US Army Rapid Capability & Critical Technology Office Palletized HEL System – P HEL



- Blue Halo LOCUST system delivered in 2022 to meet Joint Counter small Unmanned Aircraft Systems Office (JCSO) needs
- Includes both an Electro-Optical Tracking System and an HEL effector
- Modular Open Architecture System
- Multiple systems on order





# Lockheed Martin Laser Systems

- 30kW HEL system demonstrated capability against small UAV & small missiles
- 100kW systems demonstrated capability against advanced UAV & missile systems
- Delivered Four 60kW laser sources to the Army, Navy, Air Force & AFSOC
- Delivered a 300kW laser source to the Army RCCTO for use with the IFPC-HEL system
- Awarded a contract to develop a 500kW system for OUSD R&E





# Leonidas High Power Microwave System

- Epirus Co awarded \$66M contact for Army RCCTO Indirect Fires Protection Capability - HPM
- Demonstrated counter Swarm electronic defeat capability
- Detailed briefing later this week!





# The Directed Energy Contribution

- Low Collateral Damage, with proven Results
- Magazine Depth – just need Electricity!
- No complex training required – demonstrated at the E-4 level
- Timing is right for both domestic & overseas protection
- As the system power increases, additional target sets become included – complexity increases as well
- Use the deployments to determine the system spares and logistics for in-field repairs