Welcome to the 2023 Army Aviation Industry Days

"HONORING THE PAST - TRANSFORMING FOR THE FUTURE"

ARMY AVIATION
DECISIVE IN MULTIDOMAIN OPERATIONS

U.S. ARMY

Agenda

40th Anniversary of Army Aviation: Honoring the Past – Transforming for the Future

8 AUG (TUE)	9 AUG (WED)	10 AUG (THUR)
0800: Golf Tournament 0830-1700: Industry setup in The Landing	**0630-0800: Breakfast at The Landing**	
	0830-1700: Industry Displays Open at The Landing	**0830-1200: Industry Displays Open at The Landing**
	Briefs in the Theater: 0830-0845: MG McCurry – Welcome / Opening Remarks 0845-0930: GEN Brito (TRADOC) – Army 2030 Update 0930-1015: LTG Coffman (AFC) – Army 2040 Update **** Break **** 1030-1115: MG McCurry / MG Buzzard / MG Costanza– Maneuver Panel **** Break **** 1130-1200: MG O'Connor (AMCOM) – Aviation Sustainment Update **** Lunch **** 1315-1345: SES Kirsch (DEVCOM AvMC) – S&T Update 1345-1415: SES Davis (PEO AVN) – Program Update 1415-1445: COL Higgins (ACDID) – Modernization Priorities **** Theater Events Complete **** 1445-1700: Dedicated Booth Time 1700-1900: Industry Social (The Landing)	Briefs in The Landing Zone: 0900-0920: PM FLRAA – FLRAA Update 0920-0940: PM FARA – FARA Update 0940-1000: PM AMSA / AE-RDD – Comms / MC Update 1000-1020: PM ASE / AE-RDD – ASE Update **** Break **** 1040-1100: PM TAGM / ACM-RA – Lethality Update 1100-1120: PM Apache / ACM-RA – AH-64 Update 1120-1140: PM Utility / ACM-Lift – UH-60 Update 1140-1200: PM Cargo / ACM-Lift – CH-47 Update 1200-1230: PM UAS / ACM-UAS – UAS Update ** End of Industry Days 2023 ** 1230-UTC: Industry Tear-down in The Landing
1400-1500: 1530-1630: Classified Plenary: Future OE (Seneff) 1700-1900: Industry Social (The Museum)		

Major General
Michael C. McCurry

16th Branch Chief and Commander
of USAACE and Fort Novosel, AL

General
Gary M. Brito

Commanding General
United States Army Training and Doctrine Command

Aviation Industry Days

40th Anniversary of Army Aviation:
Honoring the Past – Transforming for the Future

GEN Gary Brito
CG, TRADOC

Operational Environment

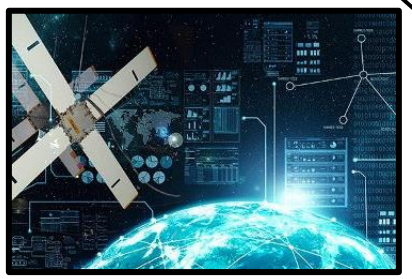
Threats to the Homeland

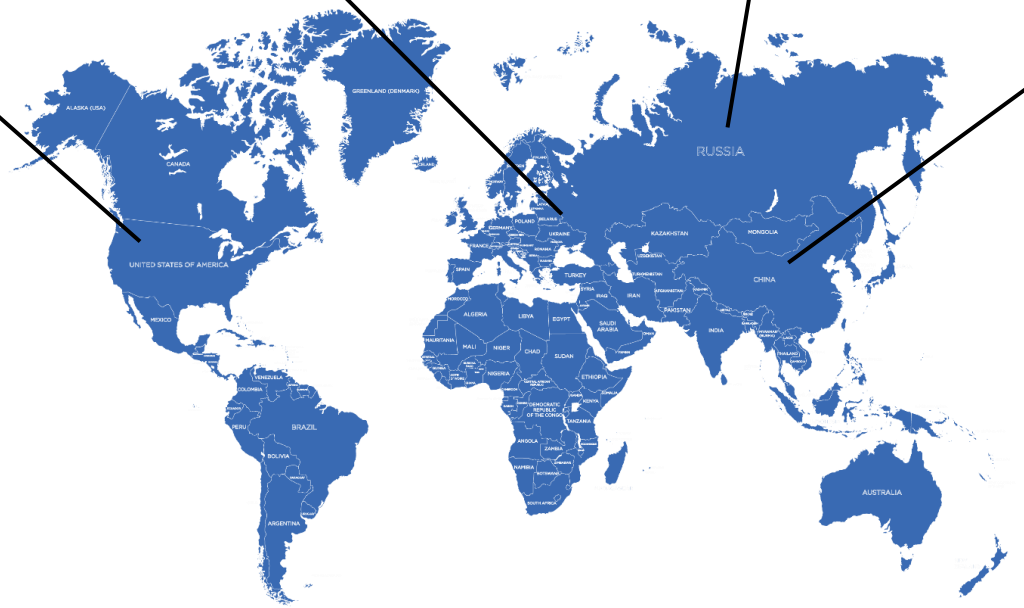
Threats to Allies

Continual Disruptor

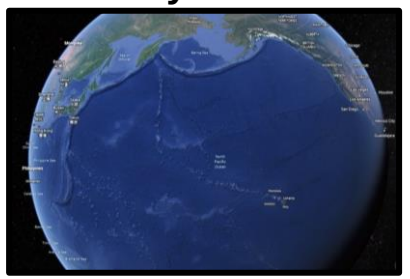
Rising Peer Threat

Developing Domains





Challenging Priority Theater



Domestic Change

Demographic

Generational

The current OE and the "Changing Character of War" drives Army 2030 modernization.

Technology Change

Drones

Hypersonics

Aviation Industry Days

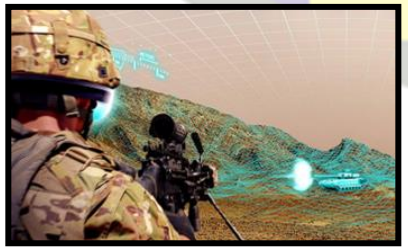
TRADOC Priorities

Acquire
The Best People

Train
The Most Lethal Soldiers

Develop
The Most Professional Leaders

Guide
Army Culture



Shape
The Future Force

Delivering Army 2030 Capabilities

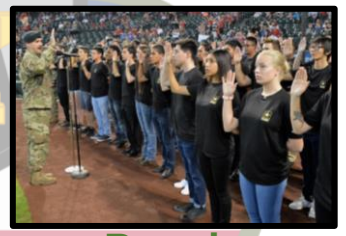
Doctrine

Organizations

Training

Leader Dev.

Materiel



People

Facilities

LTG Richard R. Coffman

Deputy Commanding General
United States Army Futures Command

Maneuver Panel

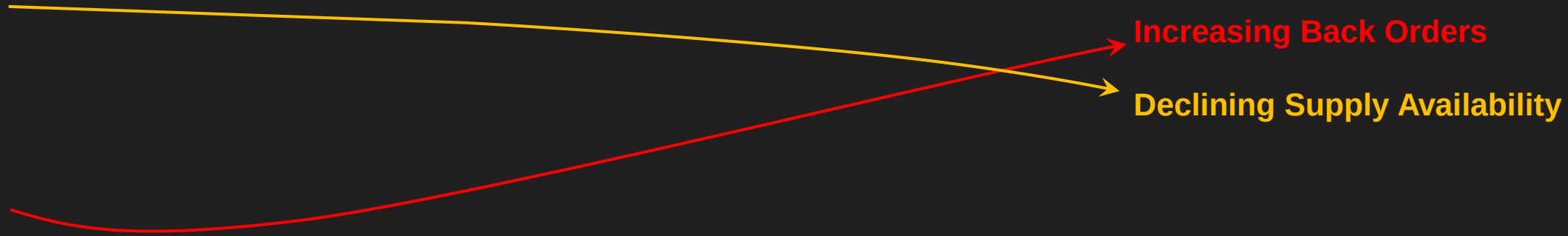
Major General
Curtis A. Buzzard
Commander, USAMCE and Fort Moore

Major General
Charles D. Costanza
Former Commanding General 3rd Infantry Division and Fort Stewart

Major General
Michael C. McCurry
Commander, USAACE and Fort Novosel


U.S. ARMY
Sustainment Update
9 August 2023
MG Tom O'Connor
Commanding General
US Army Aviation and Missile Command
TRADITION OF EXCELLENCE

Growing Risk in the Strategic Supply Posture



Strategic Depth…ready to respond to Large Scale Combat

Contract Lead Time Production Lead Time Delivery Lead Time

Need Industry Assistance:

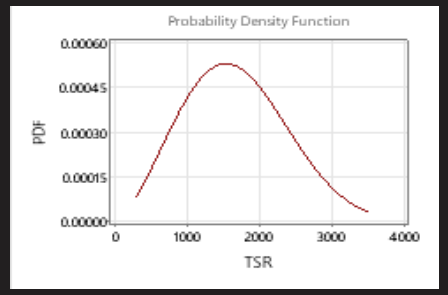
- ✓ Transparency in supply chain risk
- ✓ Use multiple sources of supply
- ✓ Sub-tier accountability
- ✓ Predictable delivery schedules
- ✓ Investment in future supply availability
- ✓ Reduce risk in supply of raw materials

Aviation Sustainment Initiatives

U.S. ARMY

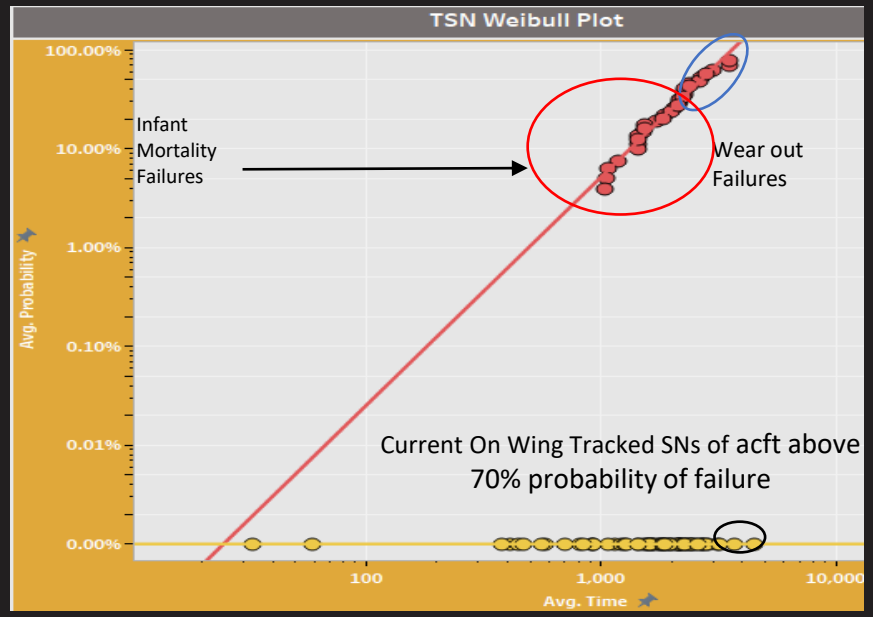
Reliability Centered Maintenance:

- ✓ Paradigm shift from hours-based replacement
- ✓ Remove components before failure
- ✓ Return components for analysis
- ✓ “Purple Tag”



Predicting Component Failure

- ✓ Very defined Wear out pattern in Time Since New with Infant Mortality and Competing Failure Modes in Time Since Repair.

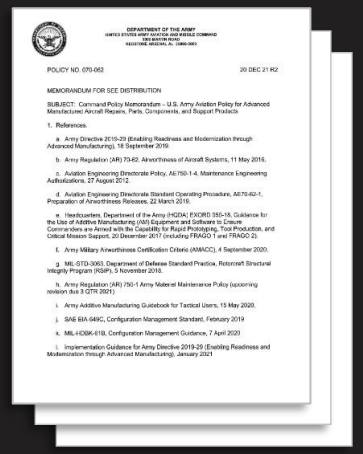


Aviation Sustainment Initiatives

U.S. ARMY

HAATF 40 – Digital Flight Time:

- ✓ 14% more flight time logged manually than captured digitally
- ✓ Saves one excess phase per MDS per battalion per year
- ✓ Avoids ~1,900 maintenance man hours
- ✓ Limited user tests begin January 2024



DEPARTMENT OF THE ARMY

POLICY NO. 070-062 20 DEC 21 HQ

MEMORANDUM FOR SEE DISTRIBUTION

SUBJECT: Command Policy Memorandum – U.S. Army Aviation Policy for Advanced Manufactured Aircraft Repairs, Parts, Components, and Support Products

1. References.

a. Army Directive 2019-29 (Enabling Readiness and Modernization through Advanced Manufacturing), 18 September 2019.

b. Army Regulation (AR) 70-62, Airworthiness of Aircraft Systems, 11 May 2016.

c. Aviation Engineering Directorate Policy, AE750-1-4, Maintenance Engineering Authorizations, 27 August 2012.

d. Aviation Engineering Directorate Standard Operating Procedure, AE70-62-1, Preparation of Airworthiness Releases, 22 March 2016.

e. Headquarters, Department of the Army (HQDA) EXORD 350-18, Guidance for the Use of Additive Manufacturing (AM) Equipment and Software to Ensure Commanders are Armed with the Capability for Rapid Prototyping, Tool Production, and Critical Mission Support, 20 December 2017 (including FRAGO 1 and FRAGO 2).

f. Army Military Airworthiness Certification Criteria (AMACC), 4 September 2020.

g. MIL-STD-3063, Department of Defense Standard Practice, Rotorcraft Structural Integrity Program (RSIP), 5 November 2018.

h. Army Regulation (AR) 750-1 Army Materiel Maintenance Policy (upcoming revision due 3 QTR 2021)

i. Army Additive Manufacturing Guidebook for Tactical Users, 15 May 2020.

j. SAE EIA 649C, Configuration Management Standard, February 2019

k. MIL-HDBK-61B, Configuration Management Guidance, 7 April 2020.

l. Implementation Guidance for Army Directive 2019-29 (Enabling Readiness and Modernization through Advanced Manufacturing), January 2021

Advanced Manufacturing Policy:

- ✓ Airworthiness requirements are paramount
- ✓ Common accepted standards
- ✓ Requirements based on risk category
- ✓ Define traceability requirements
- ✓ Collaborative effort across the enterprise
- ✓ Next workshop November 2023

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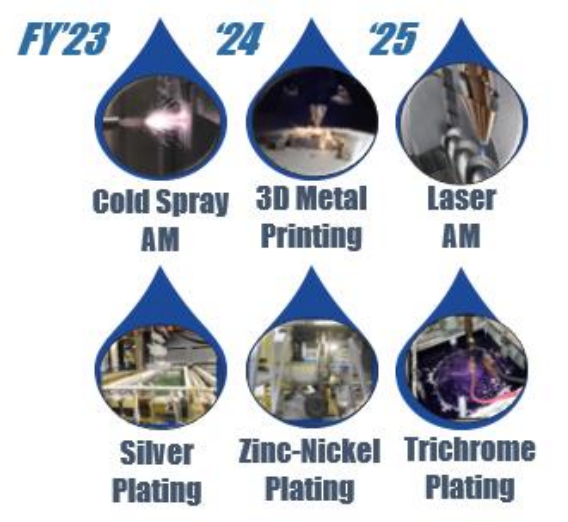
Success in Public Private Partnerships

Manufacturing Technologies

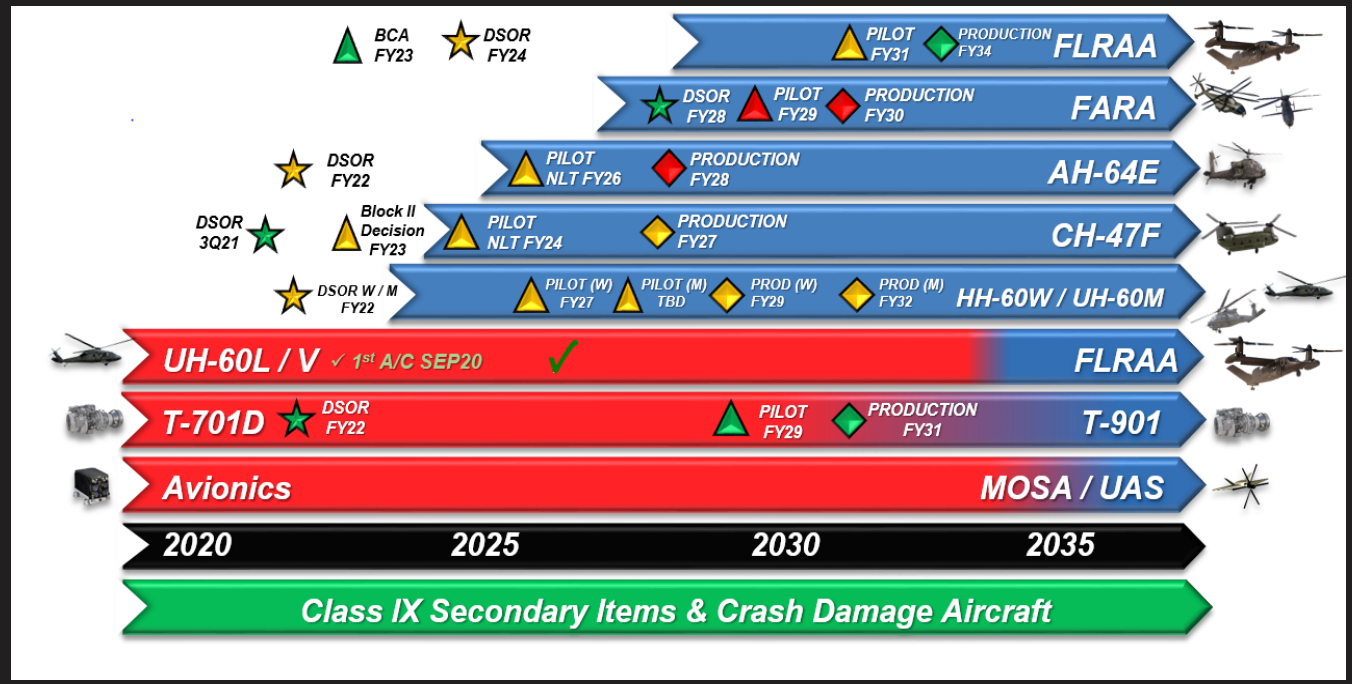
Existing

Emerging



Public Private Partnerships

BOEING
SIKORSKY A LOCKHEED MARTIN COMPANY
Parker Aerospace
MOOG AIRCRAFT GROUP
AVIATION BLADE SERVICES, INC.
Able AEROSPACE SERVICES A Textron Company
GE Aviation
CLEARWATER DEFENSE



Note: All dates and imagery are notional pending Acquisition and Sustainment decisions/funding

DSOR
DECISION POINT
WORKLOAD EXECUTION
HIGH
Assumed Risk
LOW

Opportunities for Future Investment & Risk Mitigation:

- ✓ $15B AMC OIB Modernization = facilities, tooling, and training artisans to match requirements of future weapon systems
- ✓ Obsolescence mitigation for the enduring fleet
- ✓ Forecast sustainment maintenance

U.S. ARMY

Why What We Do Matters

Thank you

U.S. ARMY

DEVCOM AVIATION & MISSILE CENTER

U.S. ARMY COMBAT CAPABILITIES DEVELOPMENT COMMAND AVIATION & MISSILE CENTER

US Army Aviation S&T

Dr. James Kirsch

Director, DEVCOM Aviation & Missile Center

WHO WE ARE

CORE COMPETENCIES

SCIENCE AND TECHNOLOGY:

- Aviation Platforms & Air Mobility
- Aviation Autonomy, Teaming, Avionics & Survivability
- Missile Seekers, Guidance, Navigation & Control
- Missile Materials & Structures
- Missile Propulsion, Warhead Integration & Fuzing
- Air Defense Radar & Fire Control

LIFE CYCLE ENGINEERING:

- Airworthiness
- Product Performance
- Modeling and Simulation
- Multidiscipline Acquisition and Project Engineering
- Prototype Design and Development
- Software Engineering
- Systems Engineering, Integration, and Interoperability
- Weapons Assurance

INNOVATORS. RESEARCHERS. WORLD-CLASS SCIENTISTS AND ENGINEERS.

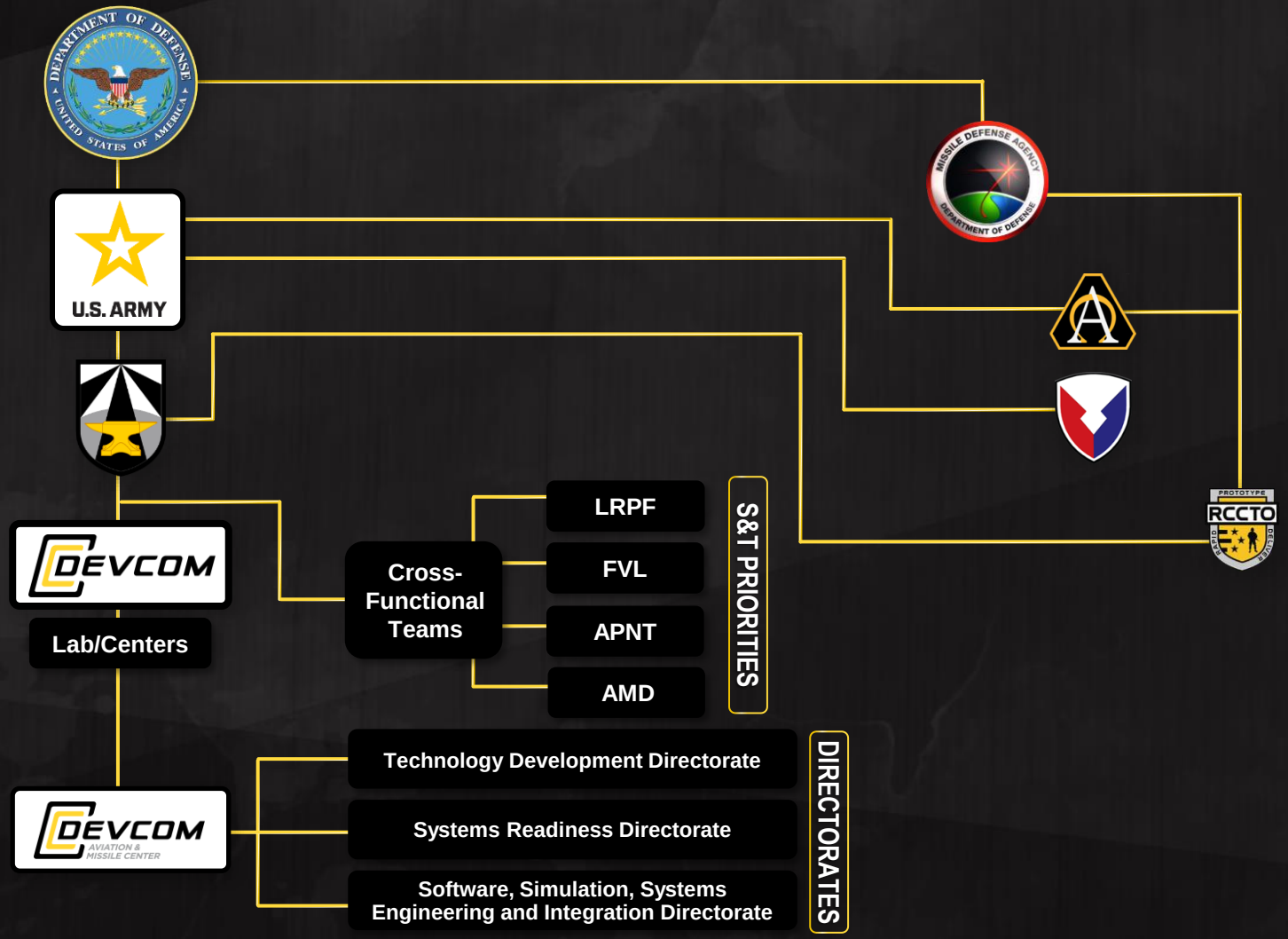
The smart people driving the discoveries and innovations that will be critical to realizing new capabilities for the Army of 2030 and beyond.

We are AvMC. The Army's focal point for providing research, development and engineering technology and services for aviation platforms and missile systems across the life cycle.

WHERE WE FIT IN

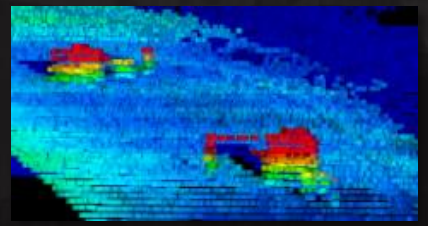
WHERE WE FIT IN

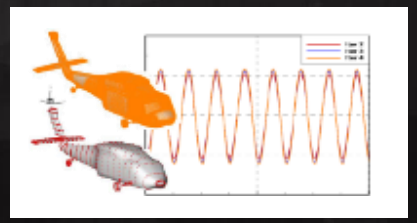
WHO WE SUPPORT

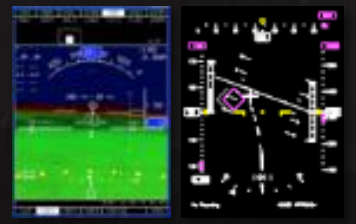


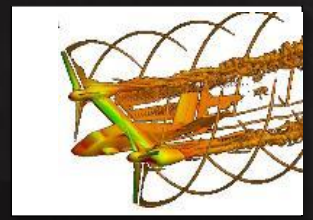
AvMC AVIATION TECHNOLOGY AREAS

- Intelligent Teaming
- Unmanned Systems
- Computational Aeromechanics
- Human System Interface
- Rotorcraft In-Flight Lab
- Drives
- Engines
- Rotors
- Concept Design and Assessment
- Structures
- Avionics & Network
- Survivability
- Experimental Aeromechanics
- Vehicle Management and Controls









FUTURE VERTICAL LIFT LINES OF EFFORT

Army Aviation is committed to maintaining vertical lift dominance with the development of critical combat systems enabling the joint force to operate dispersed over wide areas with the ability to ***rapidly converge*** in order to ***penetrate*** the multiple layers of ***stand-off*** employed by the threat, ***dis-integrate*** A2/AD systems, and ***exploit*** this advantage with enhanced Attack/Reconnaissance, Air Assault and MEDEVAC capabilities.

FARA Capability Set 1 (LOE 1)

Future Attack Reconnaissance Aircraft: Critical combat system needed to prevail in future wars by enabling Army Aviation to achieve a "leap-ahead" in lethality, survivability, and reach to find, fix, and finish our pacing threats.

FUAS (LOE 2)

Future Unmanned Aircraft Systems: Advanced teaming FVL with next generation UAS delivering lethal and non-lethal air launched effects enables cross-domain fires to penetrate and dis-integrate enemy A2AD systems and exploit expanded maneuver to overmatch peer adversaries.

FLRAA Capability Set 3 (LOE 3)

Future Long Range Assault Aircraft: Essential to exploit the windows of opportunity created by FARA and advanced teaming with UAS/ALE with its increased speed and reach providing significantly more lethal and effective Air Assault and MEDEVAC capabilities on the future battlefield.

MOSA (LOE 4)

Modular Open Systems Approach: The government defined Modular Open System Approach will establish the digital backbone of FVL aircraft allowing for rapid and affordable integration of innovative avionics and mission equipment technologies into our platforms.

AVIATION S&T ALIGNMENT TO ARMY MODERNIZATION PRIORITIES

FUTURE VERTICAL LIFT (FVL) MODERNIZATION LINES OF EFFORT

Program Executive Office – Aviation

FUTURE ATTACK RECONNAISSANCE AIRCRAFT (FARA)

PM FARA

- Holistic Team Survivability
- Adaptive & Resilient Tactical Autonomy Controls & Structures
- Advanced Rotorcraft Armament and Protection System (*ARAPS*) & FVL Radar

FUTURE LONG RANGE ASSAULT AIRCRAFT (FLRAA)

PM FLRAA

- Power & Thermal Management
- FVL Medical
- Next Generation Rotorcraft Transmission

FUTURE UNMANNED AIRCRAFT SYSTEMS (FUAS)

PM UAS

- Air Launched Effects (*ALE*)
- Holistic Team Survivability

PM TAGM

- Multi-Role Small Guided Missile (*MRSGM*)
- High Speed Maneuverable Missile (*HSMM*)

MODULAR OPEN SYSTEMS APPROACH (MOSA)

PM AMSA / PM ASE

- Advanced Teaming
- Integrated Mission Equipment (*IME*)
- Holistic Situational Awareness and Decision Making (*HSA-DM*)
- Full-Spectrum Targeting
- Convergence Battlefield Integration

Aviation Center of Excellence

APPROVED FOR PUBLIC RELEASE

AIR PLATFORM ELECTRIFICATION FRAMEWORK

2020s 2030s

ENHANCED CAPABILITY IN EXISTING ARMY AIRCRAFT

Provide 3-5x more electrical power; increased sub-system electrification; improved power & thermal management; increased stored energy density; improved electrical power density; advanced architectures; more efficient systems integration and design

How can partial electrification benefit current and FVL fleet?

Electrification

Aircraft with improved SWAP electric power and thermal management systems

Mild Hybrid*

Advanced PTMS w/Hybrid SPU to supplement aircraft electric power & potentially provide fast emergency power transfer or improve mission performance

Full Hybrid*

Electrified drive train powered by a heat engine or fuel cell potentially supplemented by energy storage for mission performance & signature reduction

EXPANDING CAPABILITY WITH EMERGING eVTOL

Training, Sustainment Quiet Recon, VIP Transport, Range Management

What jobs can be off-loaded to a lower cost aircraft type?

What new capabilities can be developed?

All-Electric*

Use available, disruptive eVTOL capability

Advanced Hybrid or Fuel Cell Powered

Army-specific use-case sized platform; silent watch; reduced IR signature

Studies: Army use-cases; technology application; system architectures; conceptual designs

Development: Army-specific gaps; safety, security, reliability, airworthiness; system integration

Experimentation: Component; integration lab; copper bird; teaming and collaboration

VEHICLE MGMT & CONTROL (VM&C)

PURPOSE

- Project ensures Future Vertical Lift (FVL) program success through accurate flight dynamics models, advanced flight controls, state of the art own-ship autonomy, and evolving handling qualities specifications for modern manned and unmanned platforms.

IMPORTANCE TO THE ARMY

- Significantly reduced time/cost/risk by eliminating iterations and redesigns late in program.
- Ability to exploit extreme/degraded environmental conditions as force multiplier.
- Ability to fight and win in presence of hardware failure or battle damage.
- Superior high-speed agility and maneuverability.
- Autonomous and optionally piloted flight.

OUTLOOK FOR THE FUTURE

- Conduct series of Advanced Rotorcraft Configurations Test of Increased Capabilities (ARCTIC) simulations on NASA's Vertical Motion Simulator (VMS) to provide FARA and FLRAA programs with independent Government capability to introduce Army pilots to advanced configurations, explore usage spectrum, and identify requirements.
- Complete Vehicle and Mission Management Computer (VMMC) upgrade and transition of Rotorcraft Aircrew Systems Concepts Airborne Laboratory (RASCAL) capabilities from original JUH-60A to a newer NUH-60M platform.

AIR LAUNCHED EFFECTS (ALE)

PURPOSE

- Provide expendable, flexible payload, unmanned aerial systems (UAS) that are organically carried and launched on demand from rotorcraft and large UAS to Find, Fix, Target, Track, Engage, and Assess threats.

IMPORTANCE TO THE ARMY

- Directly supports the FVL CFT FUAS priority. Operationally, this S&T effort will enable delivery of lethal and non-lethal effects deep into enemy territory, which increases battlefield situational awareness, accelerates the kill-chain, and improves survivability through increased stand-off range. True force multiplier especially when implemented as a collaborative Advanced Team.

OUTLOOK FOR THE FUTURE

- Integrate purpose-built air vehicles, common and open mission systems, advanced autonomy behaviors, and numerous effector payloads into an unmanned aviation system
- Demonstrate Detect, Identify, Locate, Report (DILR); Communications Relay; Decoy; Disrupt; and Lethal capabilities individually and as part of and collaborative UAS advanced team
- Demonstrate an Air Launched Effects UAS recovery system
- Deliver mature component technologies, system solutions, and knowledge incrementally to the ALE Program of Record for implementation within the Future Vertical Lift Ecosystem

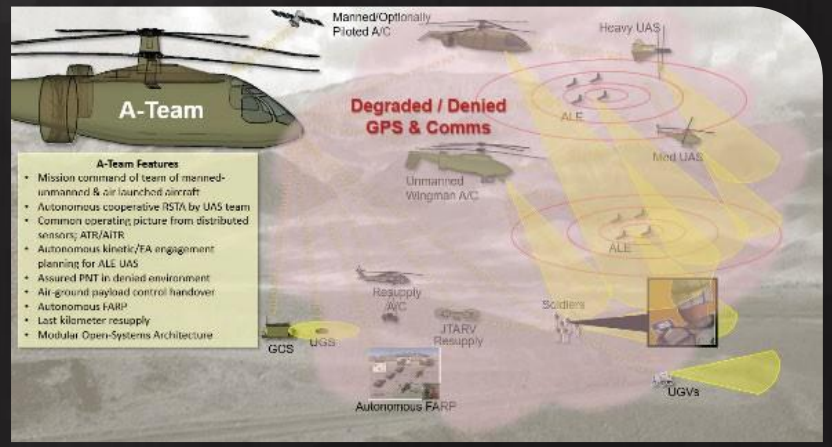
ADVANCED TEAMING

PURPOSE

- Develop and demonstrate advanced teaming capabilities for manned and unmanned aviation assets to execute tactical missions with minimal human intervention, while operating as part of a combined arms team in a contested multi-domain battle space.

IMPORTANCE TO THE ARMY

- Directly supports the FVL CFT MOSA priority. Operationally, this S&T effort will enable robust multi-UAS teamed operations in contested environments with degraded GPS/comms, survivability through shared situational awareness, and increased aviation team lethality and reach. True force multiplier especially through teams of Air Launched Effects and other FUAS.



OUTLOOK FOR THE FUTURE

- Demonstrate heterogeneous teams of unmanned aircraft autonomously executing coordinated Reconnaissance, Surveillance, Target Acquisition, Attack, Decoy, and Electronic Warfare missions capable of breaching a sophisticated Integrated Air Defense System
- Develop teaming mission systems architecture and demonstrate rapid integration of advanced autonomy and teaming technologies using a Modular Open Systems Approach (MOSA)
- Deliver technology products to PEO-Aviation early and often, showing increasing capability in successive increments by using agile development approaches

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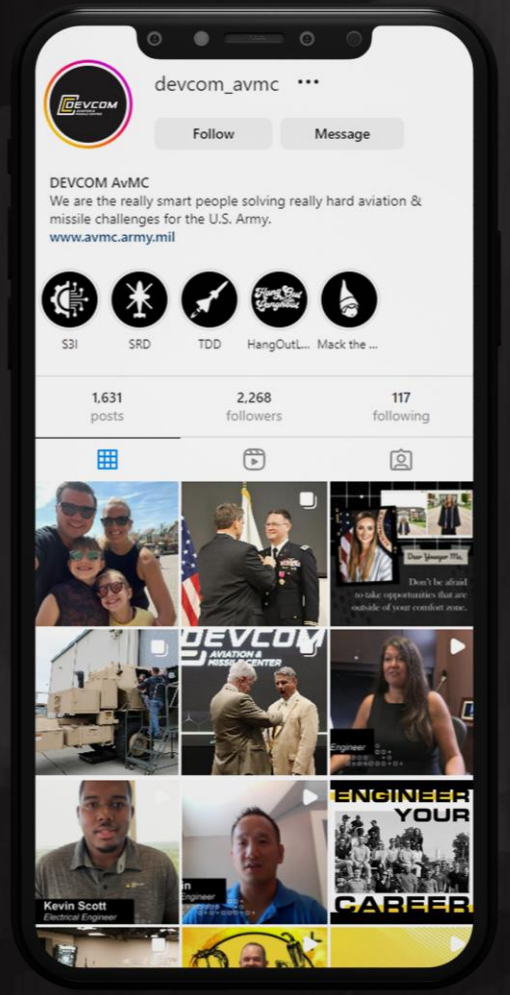

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DEVCOM.AvMC

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COL Joshua P. Higgins

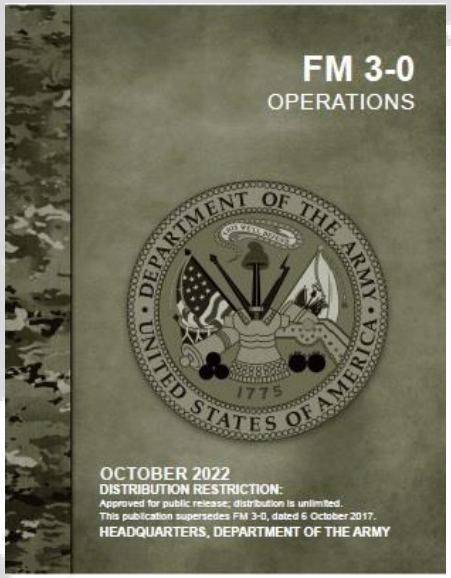
Director,
Aviation Capabilities Development and
Integration Directorate

Purpose and Agenda

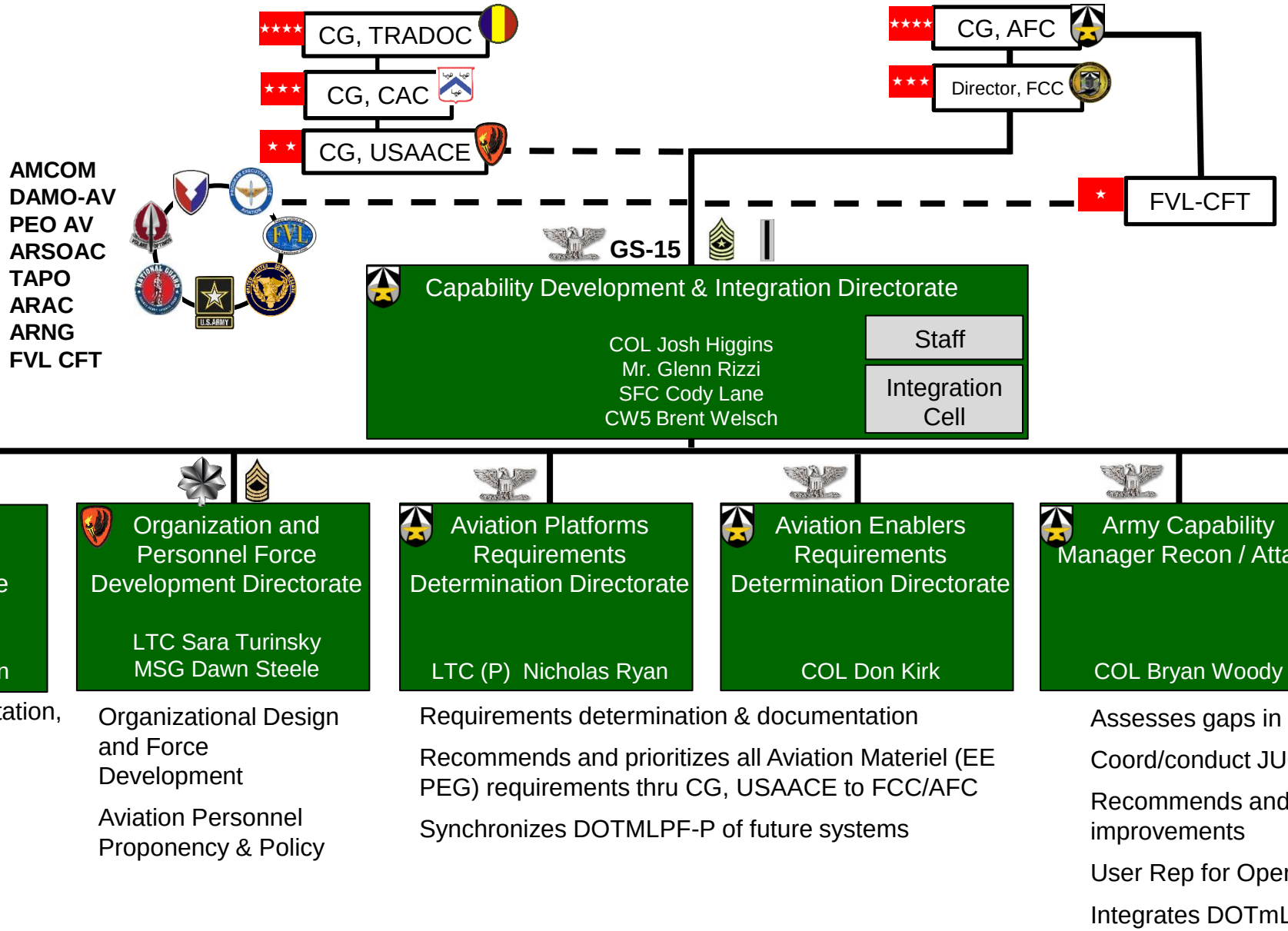
Purpose: Provide information on Aviation capability development efforts

Agenda:

- **ACDID Organization**
- **Pacing Threats**
- **Operational Environment**
- **Capability Gaps**
- **UAS Alignment**
- **Discussion/Questions**



Structure and Command Relationships



Concepts, Experimentation, Analysis, S&T

CONOPS/CONEMPS Development

Operational & Organizational Plans

Organizational Design and Force Development

Aviation Personnel Proponency & Policy

Requirements determination & documentation

Recommends and prioritizes all Aviation Materiel (EE PEG) requirements thru CG, USAACE to FCC/AFC

Synchronizes DOTMLPF-P of future systems

Assesses gaps in current capabilities

Coord/conduct JUONS, Operational assessments

Recommends and prioritizes (small m) materiel improvements

User Rep for Operational Testing

Integrates DOTmLPF-P of fielding systems

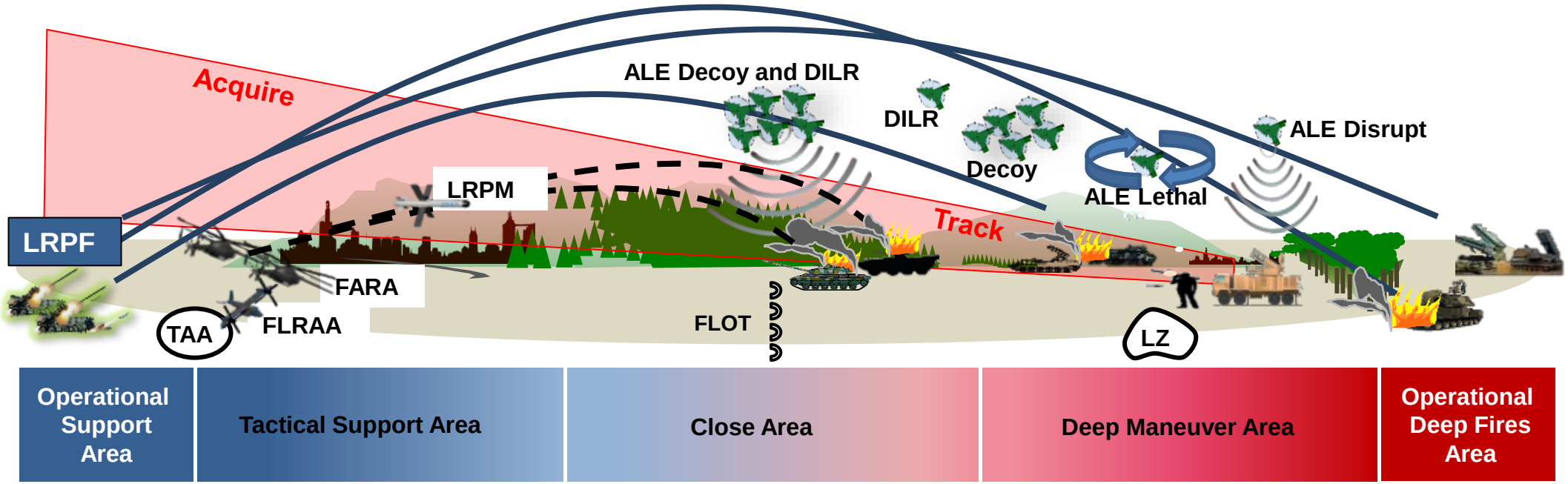
Pacing Threats

Advanced Threat A2/AD systems create multiple layers of stand-off:

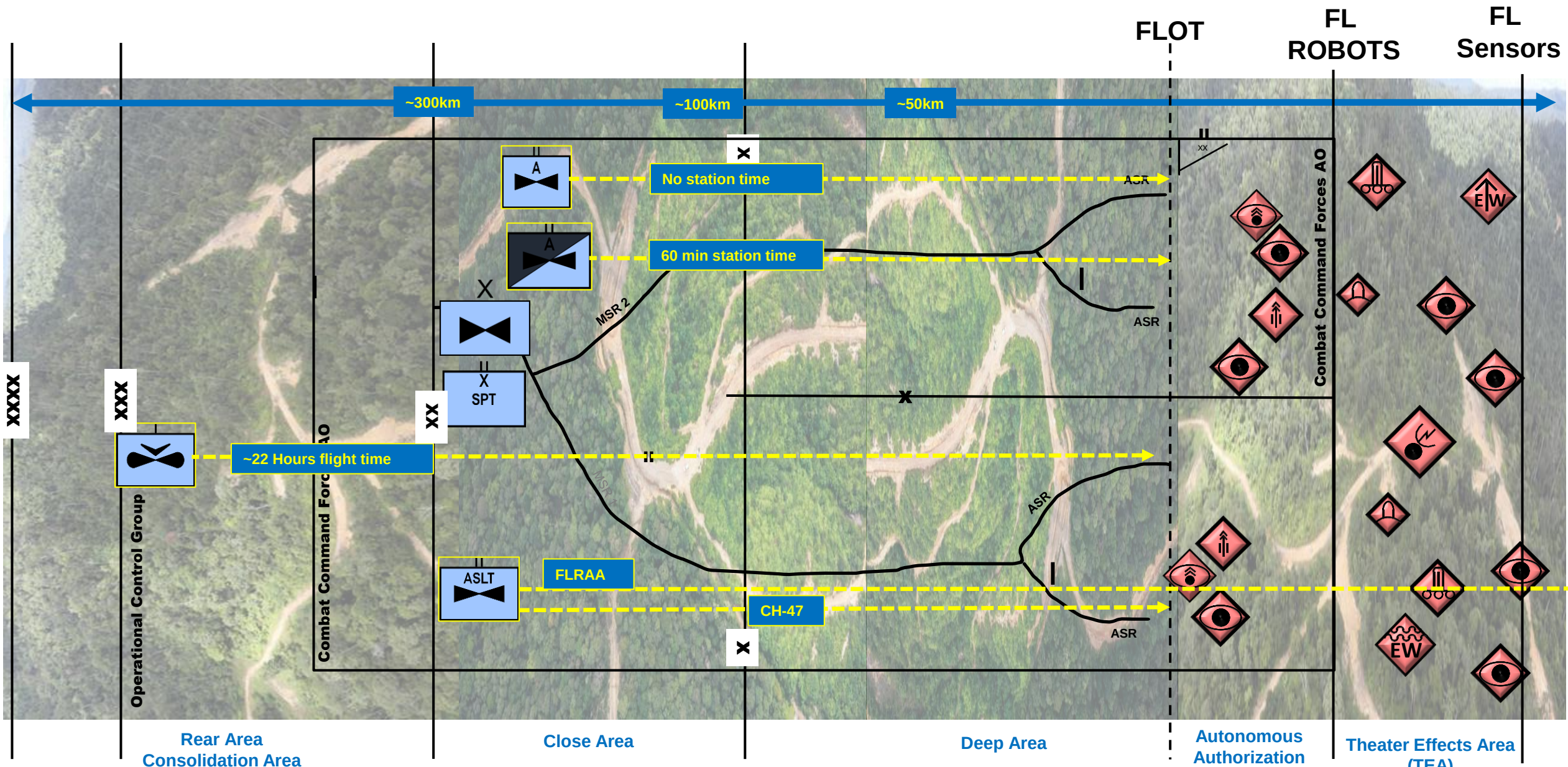
- MANPADs
- SAMs
- Active and Passive Detection
- Lethal and Non-Lethal Effects

Army Aviation will operate across the full breadth of the theater – exploit IADS limitations:

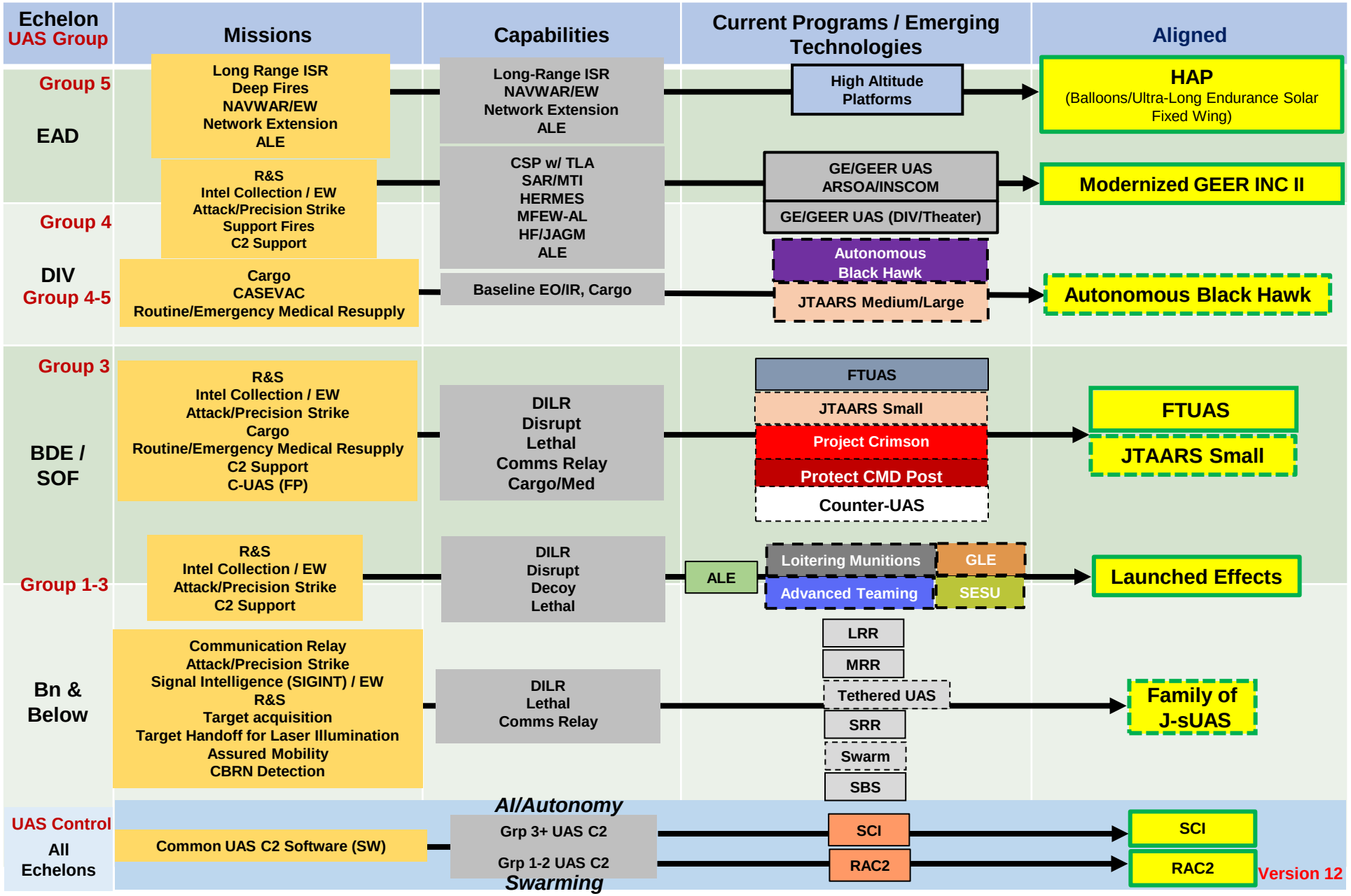
- Decisive in the Lower Tier of the air domain
- Integrate operations as part of the Combined Arms / Joint Force
- Advanced TTPs – terrain masking / avenue of approach selection
- Agile ASE – rapid technology insertions
- **Increased Speed, Range, Endurance = Survivability**



Future Operational Environment



Potential UAS Alignment



Launched Effects Family of Systems

Defining key future capabilities that clarify the roles and missions of key launched effects

Air/Ground Launched Effect

Aerial system that can launch by air or ground providing reconnaissance, surveillance, target acquisition and lethal effects that can return for reuse

Loitering Munitions

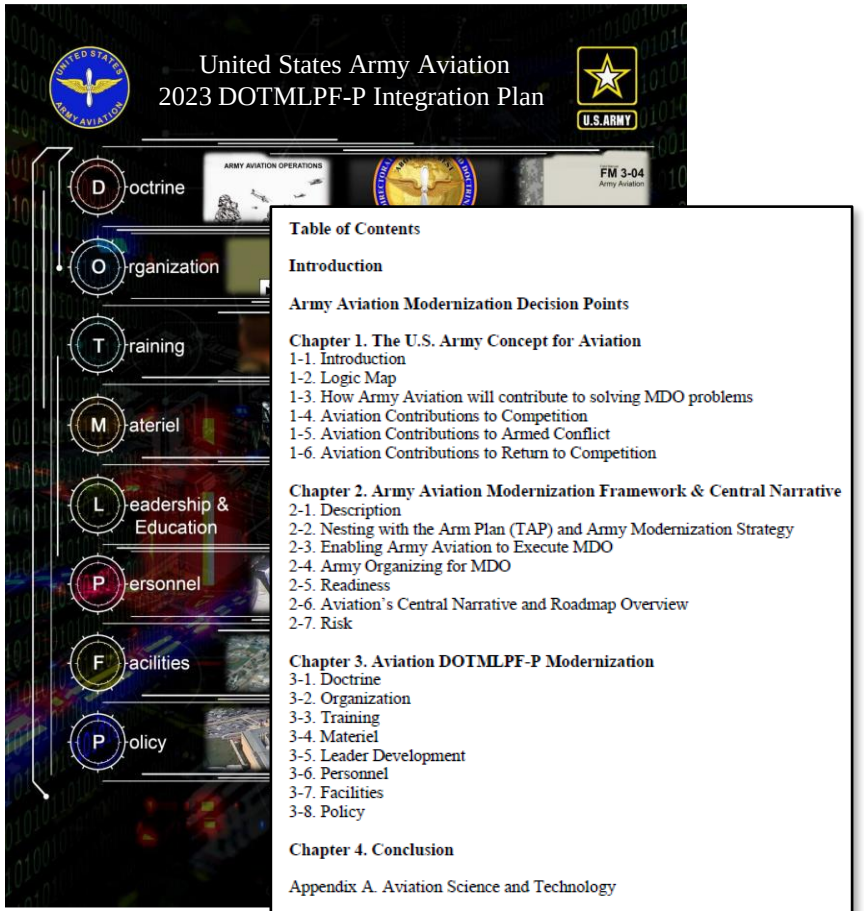
Lethal munition that can loiter in an area for a short duration to identify and destroy targets with no intent for reuse

Long Range Precision Missile (LRPM)

Missile with mid-course correction navigation to destroy stationary or moving targets

	Air/Ground Launched Effect	Loitering Munition	LRPM
Loiter			
Reuse			
AI Enabled/ Networked			
RSTA			
Non-Lethal Effect			
Lethal			

Army Aviation DOTMLPF-P



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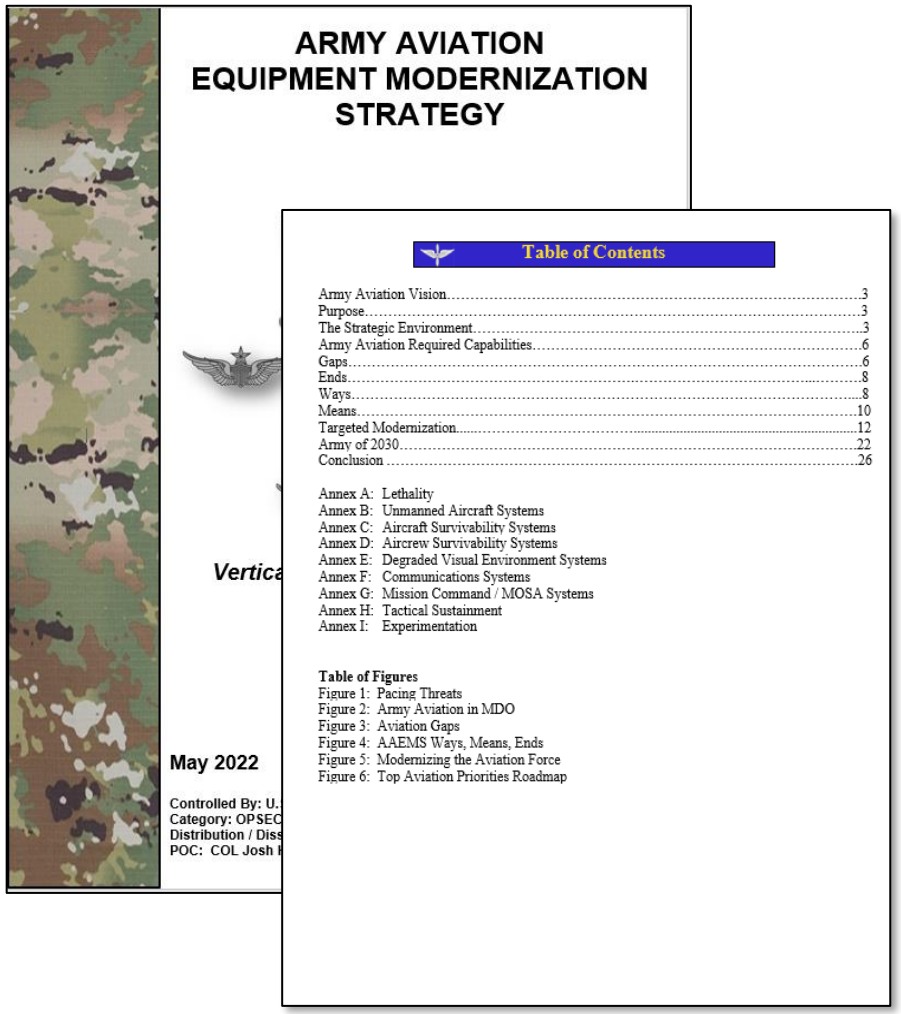
Acronyms



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Army Aviation is changing the way we are trained, organized and equipped for Large Scale Combat and Multi-Domain Operations

COL Brock Zimmerman - PM ASE
COL Donald Kirk – AE-RDD

ASE UPDATE

Threat Driven Technology Investments

Current ASE

- **Stove-piped systems**
- **Long algorithm lead time**
- **Focused on single ship survivability**
- **Specific Threat Focused; FMA dependent**
- **Expensive to Develop and Sustain**
- **Increased SWAP**
- **Mismatched APO**

Threats Advancing at Increased Rate means more threat systems faster

Integrated, Networked, and Layered requires multifunction solutions

Increased Digital Complexity means smarter and more adaptable threats

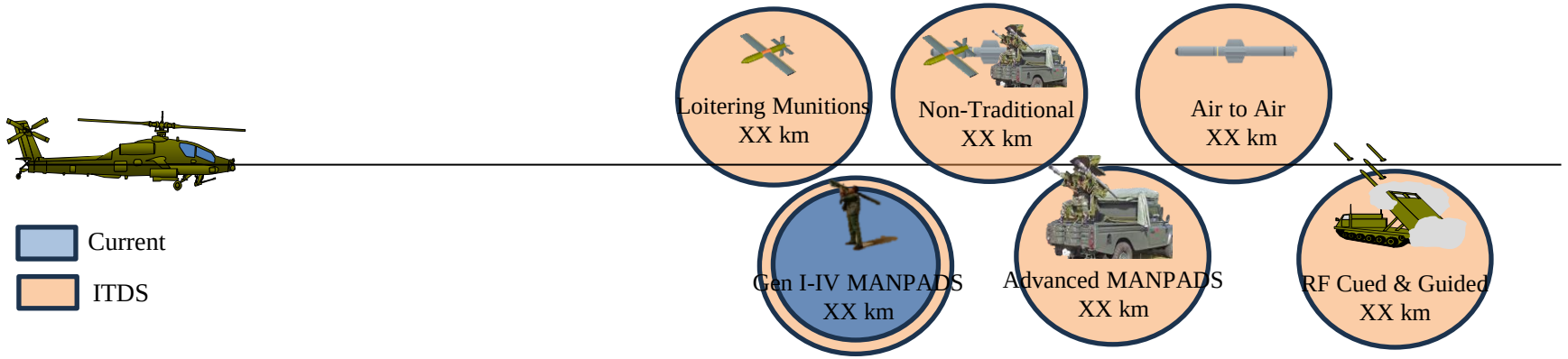
Modernized ASE

- **Digital systems quickly reprogrammable to adapt to emerging threats**
- **MOSA for rapid technology insertion**
- **Integrated digital architecture with data and sensor fusion to improve CM response**
- **Threat agnostic detect/defeat**
- **Integrated with joint capabilities**

PM ASE Strategic Priorities

- **ASE Architecture and Modernization**
  - Goal #1 - Threat agnostic detect and defeat; field rapid system updates; present relevant and actionable information; deliver multi-mission capable/enabling capabilities
  - Goal #2 – Deliver modernized ASE to FLRAA & FARA digital Mission System backbone
- **Foreign Military Sales (FMS)**
  - Strategic view of FMS which benefits the FMS customer and the USG
- **Science & Technology w/ Advanced Technology Office**
  - Mature laboratory technologies for transition into Program of Record

Improved Threat Detection System



1. ***Delivers 5x sensitivity improvement over legacy systems required for low signature threat and long-range engagements***. This enables early warning, detection, and identification of advanced threats in contested/cluttered environments without relying solely on exploitation or foreknowledge of enemy TTPs.
2. ***Advanced modular architecture*** reduces aircraft SWAP-C and integrates the ASE suite to the FVL digital backbone network to enable interoperability, multi-ship teaming, multi-function sensor off-boarding, supports ALE, real-time threat adjudication, and decision analysis.
3. ***Multi-function sensor suite and architecture*** that contributes to DVE, SA, PNT, and Targeting mission set's which are vital to safe aircraft and occupant operations.

ITDS enables increased stand-off, Freedom of Maneuver, and survivable Penetration for Air Assault, Air Movement, Personnel Recovery and MEDEVAC operations in an IADS contested environment.

COL Bryan Woody – ACM-RA

AH-64 Update

AH-64 Modernization Concept

The U.S. Army anticipates the AH-64 Apache's execution of both Reconnaissance and Attack missions through 2050

United States Army
Apache Attack Helicopter Modernization Concept
February 2023

Provides context, modernization direction to mitigate the AVN RECON/ ATK problem statement:
Based on the Future OE, how does Army Aviation conduct air-ground operations in support of Army/Joint forces in multi-domain operations?

Lethal, Sustainable, Resilient, Survivable, and Responsively Agile
2022 National Defense Strategy (NDS) priorities

Competition, Penetration, Dis-Integration, and Exploitation operational phases
All Domain Strategic Environment - Land, air, maritime, space, and cyber space
FM 3-0, Pacing Threat(s)

See, Move, Strike, Extend
The United States Army Aviation Center of Excellence's (USAACE) directives conform with the NDS and exists within these four lines of effort. Incorporates:
AVN GAP Analysis, FDU, Lethality Strategy

Communicate, Move, Shoot, Sustainment, and Training/Simulation
Reconnaissance-Attack Ecosystem-

- **Incorporates *both*** the Future Vertical Lift (FVL)-Future Attack Reconnaissance Aircraft **(FARA) and Enduring Fleet assets**
- A 'pack hunting' relationship; FARA 'Finds and Fixes' the enemy, the AH-64 'Destroys' them.
- The U.S. Army anticipates the AH-64 Apache's execution of both Reconnaissance and Attack missions through 2050, with emphasis on:

Operational Reach	Survivability	Lethality	Sustainment
Global force projection; Multi-Domain Task Force interoperability (CJADSA COP); **agile** and **adaptive** tactical maneuver; **increased endurance and range**	Multi-spectral reductions, **defensive aid suite threat detection, correlation, management,** and defeat of A2/AD & IADS; 'shoot-down' technologies.	Technical parity/overmatch; Long-Range Precision Fires/Munition enablers that outpace critical Enemy Weapons Engagement Zones (E-WEZ).	Proactive management with the over-arching objective of combat power projection

The AAH Modernization Concept is a living document, informed through persistent collaboration between Program Executive Office – Aviation (PEO AVN) and ACM-RA

ACM-RA Mission Statement

As the Operating Force's representative, ACM-RA will identify and monitor critical enterprise gaps, platform shortfalls, and operational deficiencies using real-time feedback mechanisms from operators, aircrews, aviation units, and industry partners and apply tangible and cost-effective DOTMLPF-P solutions.

Key Tasks:

1. Liaise with the end user and operational units across all Army components.
2. Provide a forum for industry on current and emergent technologies that nest with ACM-RA priorities and efforts.
3. Provide feedback for on-going efforts, objectives, and milestones to enterprise partners and users.
4. Maintain a platform/enterprise COP and running estimate that synchronizes and measures all efforts.
5. Maintain, update and share AVCDID/ACM-RA modernization efforts from the attack/recon/lethality portfolios.
6. Synch efforts with Program Managers, Program Executive Offices, AvCOE, and aviation leaders.
7. Develop tangible solutions for the Warfighter nested within DOTMLPF-P.

End State:

Platform: The AH-64 Apache remains the principal attack and reconnaissance rotary wing platform capable of surpassing all tactical mission requirements and operational tasks – attack, movement-to-contact, reconnaissance, and security. The Apache will remain dominant on the battlefield via a MOSA-compliant system-of-systems that seamlessly integrates ASE, sensors, weapon systems, and all operational functions. The AH-64 will be fully capable of operating in a Degraded Visual Environment (DVE) ISO maneuver operations, the joint force, and during Large Scale Combat Operations (LSCO). The Apache will employ a host of munitions that capitalize on weapon systems capabilities across the depth of the battlefield – Close (ACFT – 3k), Near (3k-16k), and Long (16k – ≥40k), – that ensures maximum destruction and aircrew survivability.

Attack & Lethality Imperatives

- Modernization efforts and upgrades are nested and remain nested with current and emerging doctrine.
- Common configuration and common capabilities (C4) across the entire Apache fleet.
  - Reduce and streamline logistical burdens.
  - Meets or exceeds mandates.
  - C4 reduces training deficiencies and provides training commonality for all aircrew members.
  - An Apache is an Apache – BOI increases for key systems provides leaders more options on the battlefield.
- Attack and Lethality efforts meet projected milestones/targets and remain in synch with FVL and FARA modernization efforts.
  - “Pack Hunting” – FARA finds, the Apache destroys.
- Maintain dominance at night with upgraded Night Vision Systems capable of taking full advantage of a weapon systems max effective range.
- Heads up and eyes out.
  - Bi-ocular Color Head Mounted Display.
  - Integrated and configurable sensor data.
- Take full advantage of the Improved Turbine Engine (3850 SHP).
  - Upgrade the powerplant and powertrain to meet operational mandates – 6k/90 degrees.
  - Regain full tail rotor authority while hot, heavy and at a hover.
  - Increased fuel efficiency = range = lethality = mission success.

SEE - MOVE - STRIKE - EXTEND

Attack & Lethality Imperatives

- Conduct Attack/Recon operations at night, during adverse WX, and within a DVE with operational risk no higher than Medium.
- Seamless and MOSA compliant multi-sensor data fusion (AESA – G3RFI – CSEU – ASE) that provides:
  - A Common Operational Picture (COP) for aircrews, supported maneuver units, and decision makers.
  - See the enemy before he sees you, provides an immediate weapons solution that ensures survivability.
  - Reliability and with confidence, operate across the entire DVE spectrum.
- Regain battlefield lethality and standoff distance – aircrew adherence to engagements in the last 1/3 of a weapons maximum effective range:
  - Long Range Precision Munition (8km - >40km) for high payoff targets, IADS and FARA identified objectives.
  - Joint Air-to-Ground Missile MR (500m – 16km) for armored vehicles and targets with Active Protection Systems (APS).
  - Advanced Precision Kill Weapon System w/wo HEAT/APAM and HoB (1km –5km [7km with Single Variant Block Upgrade]) – low cost, precision munition for light skinned, lightly armored (HEAT) vehicles and personnel (HoB).
  - 30mm Proximity Fuze (100m – 3km). Target Set: Unmanned Aerial Systems, light skinned vehicles and antipersonnel/material.
  - Fix M230 accuracy
- HYDRA II
  - Autonomous or semi-autonomous, fire and forget rocket capable of employing a full suite of lethal and non-lethal warheads.
  - Increase accuracy and reduce aircrew exposure.

SEE - MOVE - STRIKE - EXTEND

Attack & Lethality Imperatives

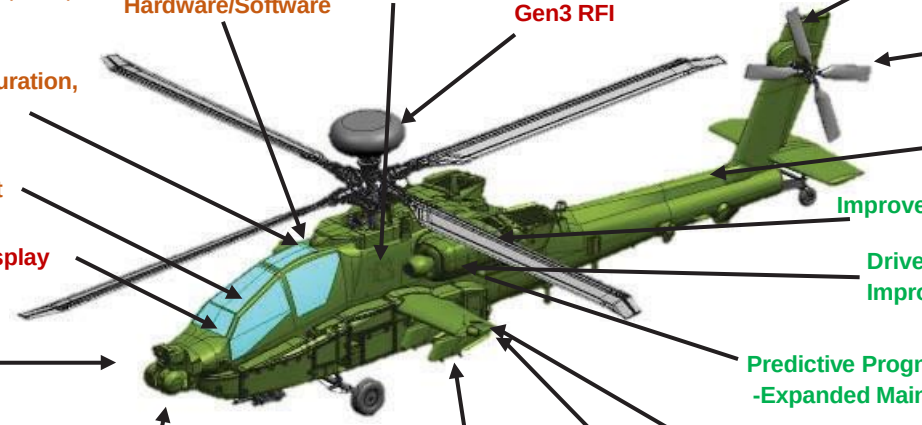
- Develop a Single Launcher System (SLS) that will accommodate current and future munitions while replacing the M299 and M261.
  - Ability to carry and fire multiple munitions (HELLFIRE, JAGM, LE, LRPM, rockets) from the same launcher.
  - Provides greater flexibility.
- Oil Cooled Generator:
  - Eliminate failures and aircrew reliability issues.
  - Anticipate increased DC loads for current and future systems.
- Fused communications suite that meets crypto requirements
- Develop a sensor and TTPs that mitigate the threat of ATGMs employed against rotary-wing aircraft.

SEE - MOVE - STRIKE - EXTEND

OWN THE NIGHT – OWN THE WEATHER

MUMT-X – Installed in place of FCR
MUMT Software/Hardware Upgrades (Expanded Auto-Tune, C-UAS, RWR, ALE, LRPM)

Advanced Flight Controls
MOSA-Enabling Hardware/Software
AESA Radar Gen3 RFI
Assured Positioning, Navigation, and Timing
Improved Tail Rotor Blade (ITRB)
Crypto Mandate, Common Configuration, Common MEP
Improved Tail Rotor Drive System (ITRDS)
Next Generation Cockpit
Improved Turbine Engine (ITE)
Bi-ocular Helmet Mounted Display
Drivetrain, Rotor, and Airframe Improvements for full 3850 SHP
TADS GEN II Turret (G2T)
Modernized Night Sensor (16km+)
Predictive Prognostic Maintenance -Expanded Maintenance Free Operating Period
Link 16 Advanced Capabilities
Fused Pilotage & Targeting Sight and Sensors (Common Sensors Electronics Unit)
Single Launcher System (JAGM (16K), Hydra II, LRPM, and LE capable)
Next Gen Aircraft Survivability Equipment (ASE) with Sensor Fusion



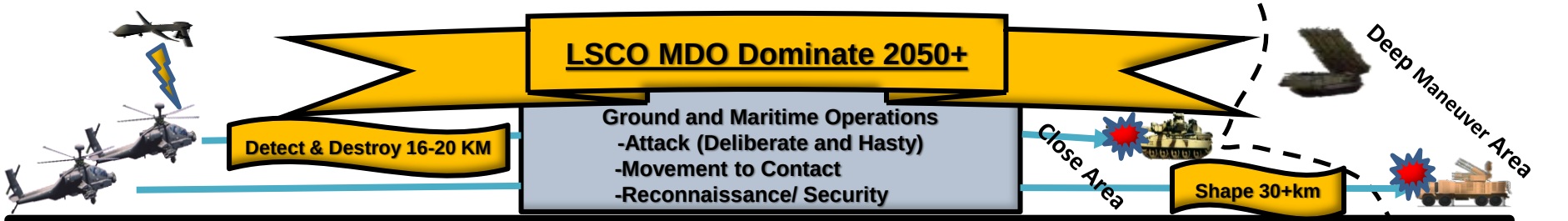
SHOOT
- TADS GEN II Turret
- Modernized Night Sensor (16km+)
- Single Launcher System (JAGM (16K), Hydra II, LRPM, and LE capable)
- JAGM (dual mode seeker provides Adverse Wx precision engagements)
- Bi-ocular Helmet Mounted Display
- Next Generation Cockpit
- AESA Radar
- Modernized RFI
- Fused Targeting Sight and Sensors (CSEU)

MOVE
- Improved Turbine Engine
- Improved Tail Rotor Blade (ITRB)
- Next Gen ASE Interoperability with Sensor Fusion
- Assured Positioning, Navigation, and Timing
- Improved Tail Rotor Drive System (ITRDS)
- Drivetrain, Rotor, and Airframe Improvements for full 3850 SHP
- Advanced Flight Controls
- Predictive Prognostic Maintenance -Expanded Maintenance Free Operating Period

COMMUNICATE
- Crypto Mandate, Common Configuration, Common MEP
- Link 16 Advanced Capabilities
- MUMT Software/Hardware Upgrades (Expanded Auto-Tune, C-UAS, RWR, ALE, LRPM)
- MOSA-Enabling Hardware/Software
- Next Generation Cockpit

SEE - MOVE - STRIKE - EXTEND

2035+ ATK Modernization



AH-64 Challenges/ Opportunities:

1. D Model Sustainment
2. Common Configuration
3. Longbow Crew Trainer / Simulation

Critical/ Urgent Needs

1. Generator Improvements
2. M230E1 AWS Accuracy& Repeatability
3. Bi-Ocular Color HMD

Modernization

	NEAR (FY27)	MID (FY32)	FAR (FY35+)
Reach • Execute mission from relative sanctuary • DILR and Engage last 1/3 threat WEZ • Degraded Visual Mission Execution	ACoE Gap #1- Recon, Security, Range & Endurance		
	ITE Bi-Ocular Color HMD	ITRB + ITRDS	Next Gen Sensors: Targeting & Pilotage
Lethality • Range Medium Battlespace (16-20km) • TLE CAT 1 Precision • APS/CM Defeating Effects	ACoE Gap #4- Lethality Options, SEAD/ DEAD: E-WEZ, APS		
	M230E1 30mm Prox Fuze SPIKE NLOS	LRPM JAGM (16K), Hydra II	Directed Energy
Sustainment • Conditions Based Maintenance • Expeditionary AGSE • ++Maintenance-Free Operating Period	ACoE Gap #3- Readiness During Expeditionary High Combat OPTEMPO		
	GEN2 Turret STAMP/SLED MSPU	Flight Regime Recognition Software	In Cockpit Diagnostic
Survivability • Detect, Defeat, Locate • Common Operating Picture (CJADC2) • Win in D3SOE	ACoE Gap#5- Protect Aircrews: Advanced Threat & C-Air		
	CIRCM / LMWS MAGNA / EAGLE-M	MRFI MUMT C-UAS	AESA/ASE-Sensor Fusion Link-16 / BFT Next

SEE - MOVE - STRIKE - EXTEND

COL Bryan Woody – ACM-RA

Ms. Misty Glover - PM TAGM

Lethality Update

Army Aviation Lethality Strategy

Lethality Strategy focuses on the following tenants:

- ***Reach***: Increased effective range to enable engagements beyond enemy weapons engagement zones (E-WEZ).
- ***Lethality***: Increased lethal and non-lethal effects with precision and area target capabilities.
- ***Survivability***: Aircrew survivability is achieved by employing survivable munitions with the ability to counter threat systems designed to engage the munitions after launch by utilizing trajectory shaping, low observability characteristics, masking, etc., and crew utilization of enhanced Tactics, Techniques, and Procedures (TTP).
- ***Affordability*****:** combine reach, lethality, and survivability with a cost-effective solution that achieves desired munition effects while maximizing stowed kills.

Current

Hydra Rockets

Hydra Family of Rockets provides lethal and non-lethal effects

- High explosive, Flechette, MPSM
- Smoke screening, marking, illumination

APKWS

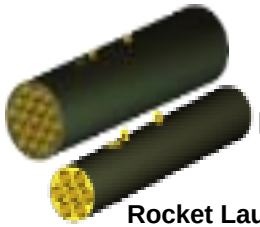
APKWS – Precision Rocket

- M151 HE Warhead
- Accuracy similar to HELLFIRE
- HEAT/APAM
- Height of Burst/Prox

HELLFIRE

HELLFIRE – Anti-Armor, Buildings, Bunkers, Maritime

- AGM-114L Longbow – Radar Guidance
- AGM-114R Romeo – SAL Guidance, Selectable Fuzing



M260/M261 Launchers

Rocket Launchers

- M260 – 7 shot
- M261 – 19 shot

M230E 30mm

M789 & XM1211 Prox

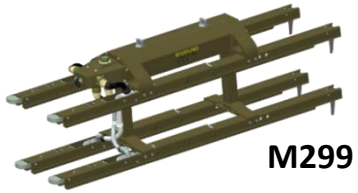
Apache Cannon – Self Protection

- M789 HEDP armor piercing
- XM1211 Prox fuzing C-UAS & Troops in the open

JAGM-16K

JAGM – Multi-purpose, Armor, Buildings, Bunkers, Maritime, CUAV

- Combines Radar & SAL guidance
- Selectable Fuzing
- Improved Countermeasure Capability



M299 Launcher

Missile Launcher

- Carries and Launches HELLFIRE & JAGM
- Digital 2-way communications

Future

Hydra II

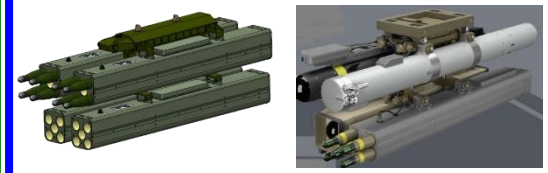
Hydra II

- Precision Guided
- Minimally Guided (IMU) - lower cost
- Lethal and Non-Lethal Capabilities
  - HEAT/APAM
  - HoB

LRPM & Spike NLOS

Long Range Precision Munition

- Future program
- Target Set – Radars, C2 Nodes, Rocket Artillery,
- SPIKE is *Interim* LRPM, limited fielding per Directed Requirement



Single Launcher System

Single Launcher System

- Carries & launches multiple munitions
- In-development

COL David Morgan

ACM-Lift Update

ACM-Lift Purpose

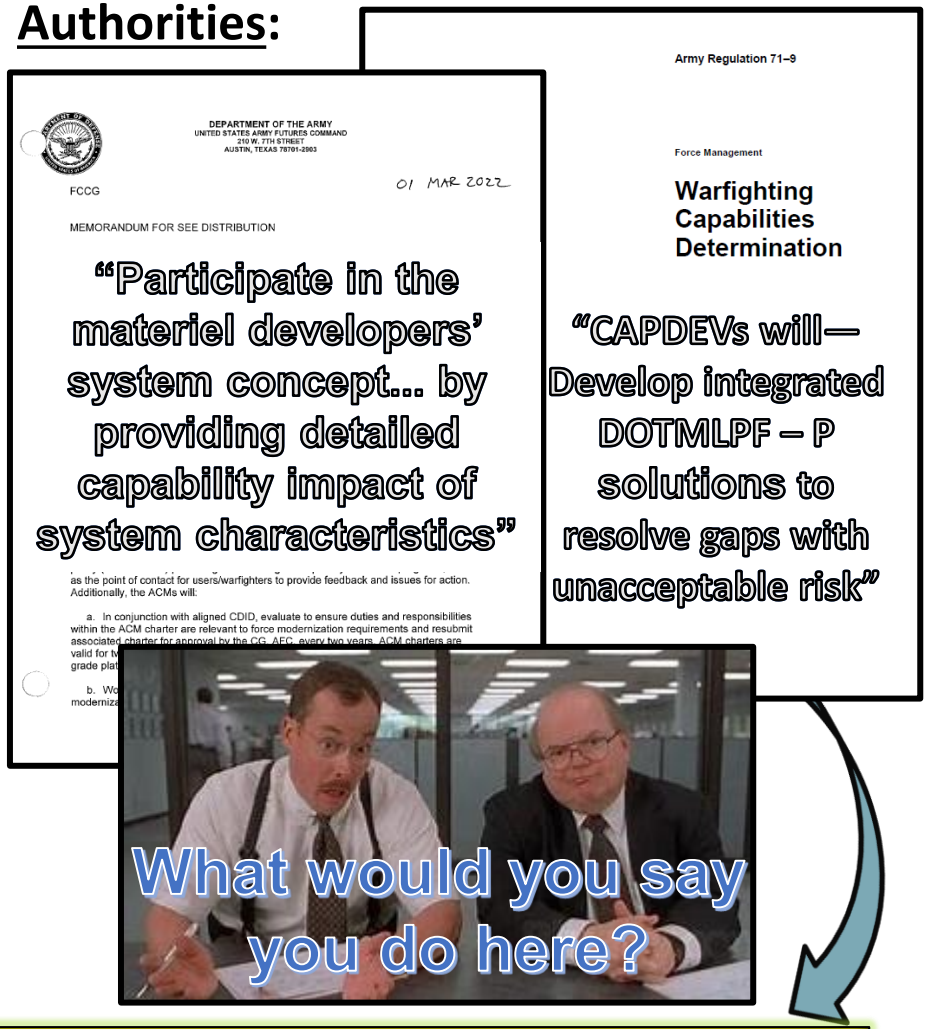
What we do:

- Manage DOTMLPF-P solutions for Aviation's Lift portfolio
- Develop requirements and align capability needs with other ACMs, CDIDs, materiel developers, and Operational Commands
- Coordinate with Commands, other ACMs, the Army Staff, and materiel developers for capability fielding
- Advise the materiel developers on system concepts and performance tradeoffs

Key Products & Deliverables:

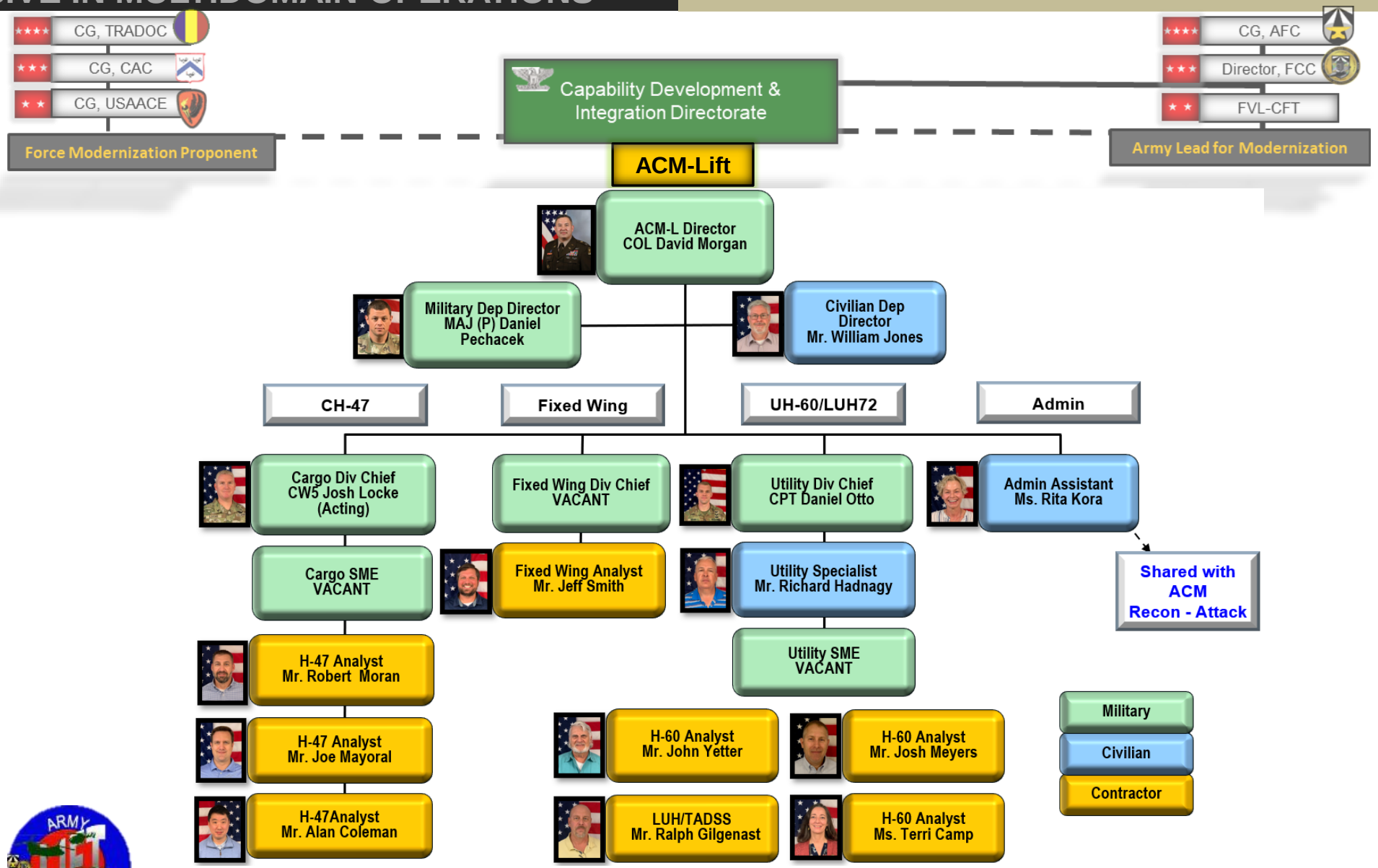
- Modernization strategies for the Lift portfolios
- Develop the Capability Integration Priority Lists and support 1-N prioritized materiel solution acquisition plans
- Develop Initial Capabilities Documents (ICDs), Capability Development Documents (CDDs), and other requirements documentation

Authorities:



"Represent the Warfighter throughout the capability & system life cycle across DOTMLPF-P areas"

ACM-Lift Organization



Supports the Force Modernization Proponent, Reports to the Lead for Modernization

CURRENT ACTIVITIES

UTILITY:
- Warfighter representation for the integration of new systems
- Refresh of requirements documents for Utility aircraft

CARGO:
- Advise Senior Army Leadership on the Cargo Helicopter Fleet Options
- Warfighter representation for the integration of new systems
- Refresh of requirement documents for the Chinook Helicopter

Fixed Wing:
- Develop plans for OSA fleet modernization
- Support capability development and integration for INSCOM fixed wing aircraft

***Support the FVL-CFT on the Future Long-Range Air Assault (FLRAA)*:**
- Provide Warfighter perspective to the mission requirements

Across ACM-Lift:
- Guide enduring platform modernization to align with the Army Modernization Strategy
- Coordinate for warfighter touch points during the solution development

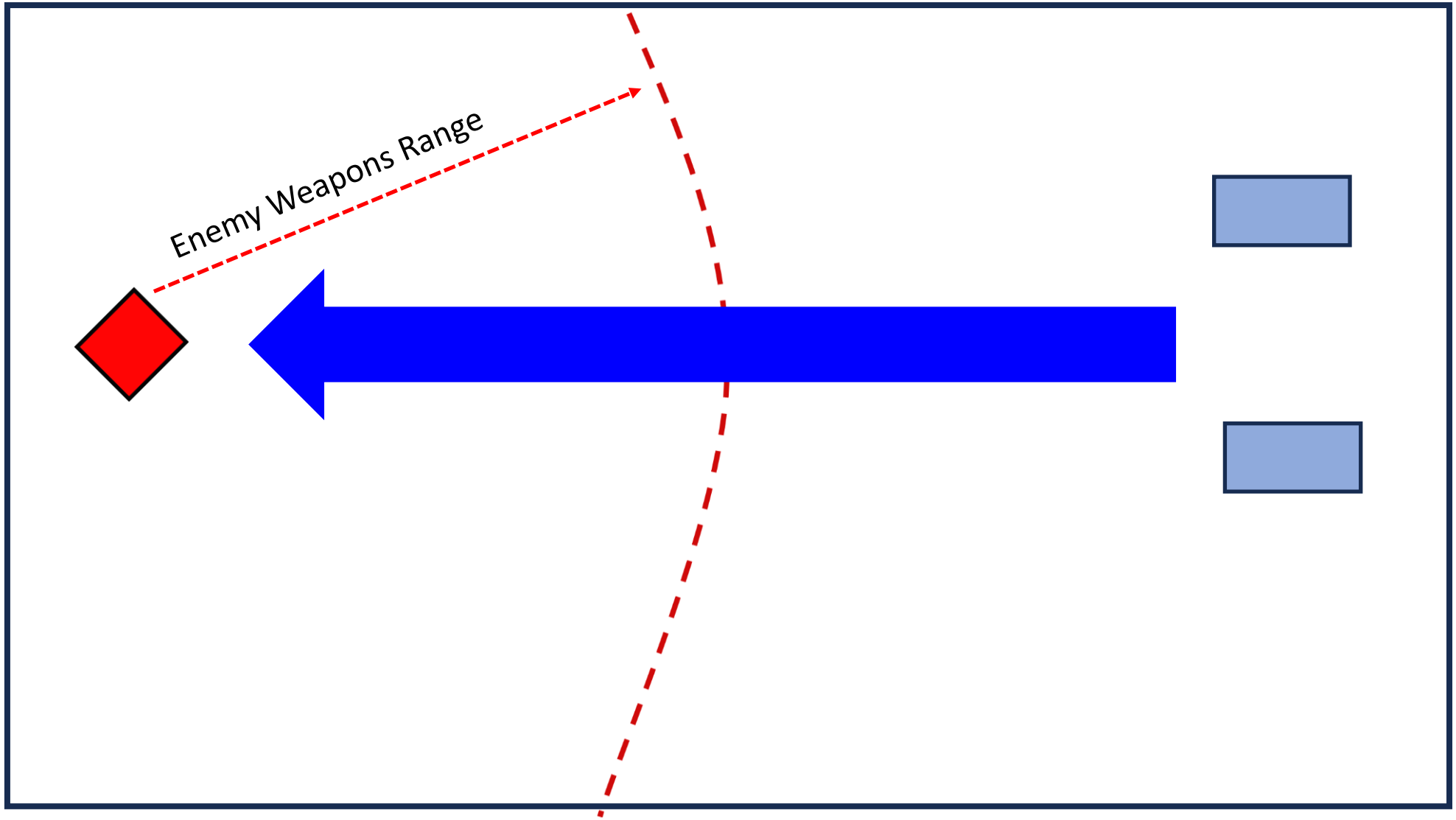
COL David Morgan

ACM-Lift Update

****White Board****

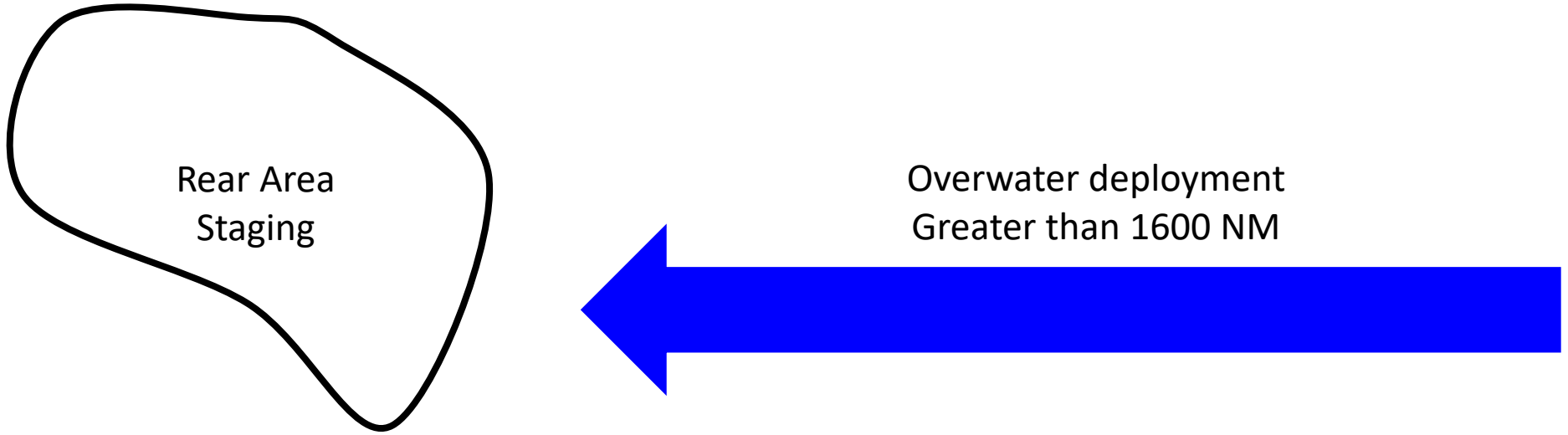
Today and the Immediate Future

Approximately 70 NM



Problem Set: Extended Self Deploy

- Range
- Fuel/Energy
- Contested or disrupted maneuver



Expect the worst conditions:

- Limited Sealift?
- No STRATAIR?

Solution Example: Marinization Kits to Refuel on Ships enroute?

Problem Set: Stagging for Ops

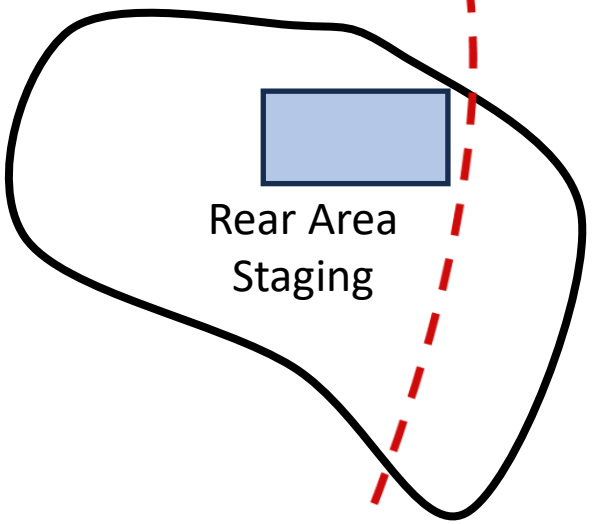
- Minimal assets for sustainment
- Limited time to prep for follow-on actions
- Protection

Threats

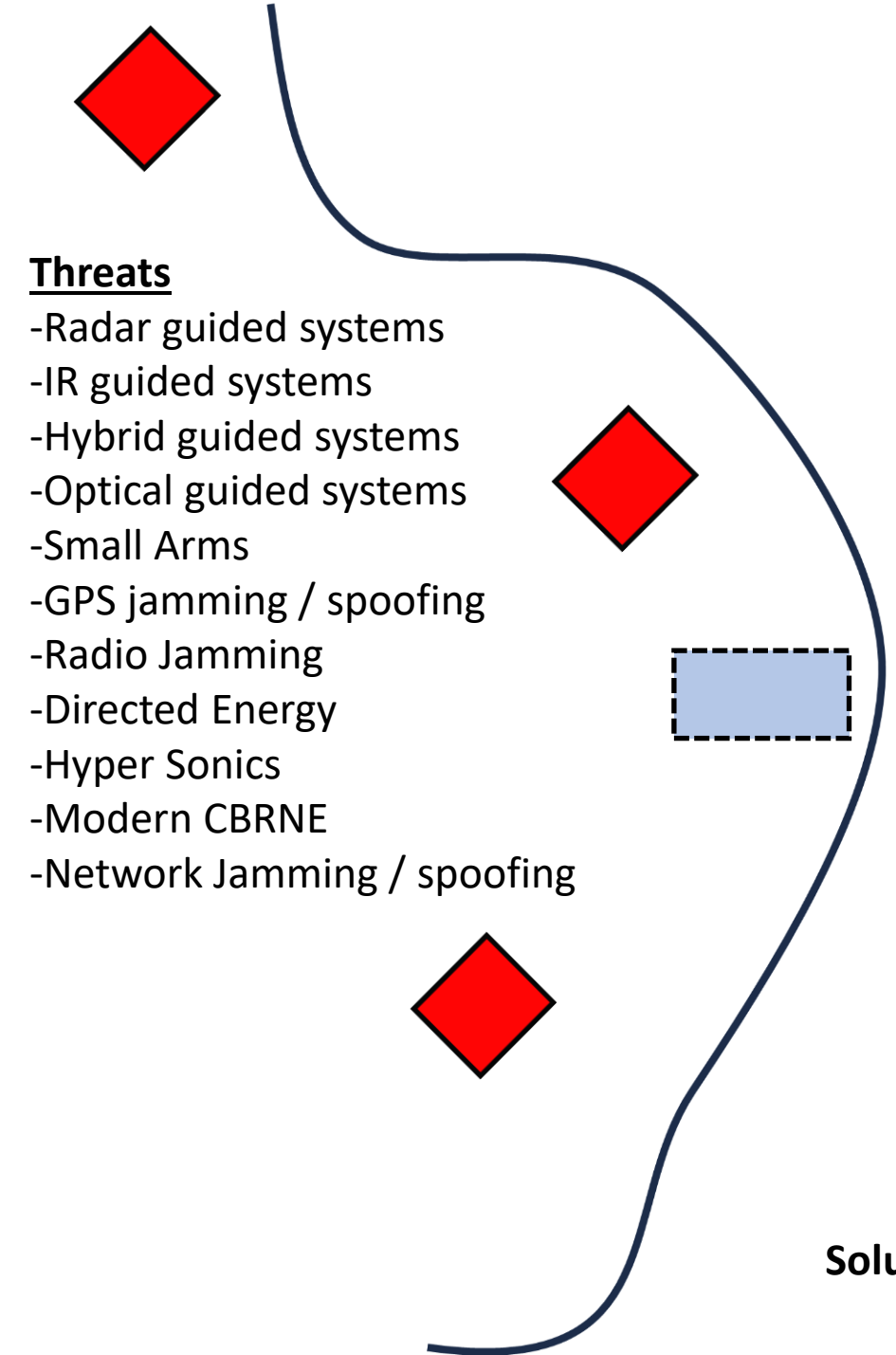
-Radar guided systems
-IR guided systems
-Hybrid guided systems
-Optical guided systems
-Small Arms
-GPS jamming / spoofing
-Radio Jamming
-Directed Energy
-Hyper Sonics
-Modern CBRNE
-Network Jamming / spoofing

Range greater than 200 NM

Enemy Weapons Range



Solution Example: Maintenance upgrades that reduce maintenance hours and manning requirements in a dispersed environment



Problem Set: Ops in Direct Action Against Adversaries

- Survivability
- Maneuverability
- Speed
- Payload
- Aero Medevac
- CASEVAC
- Assured navigation
- Signature reduction
- BLOS comms
- Ops in all visibility

Threats

-Radar guided systems
-IR guided systems
-Hybrid guided systems
-Optical guided systems
-Small Arms
-GPS jamming / spoofing
-Radio Jamming
-Directed Energy
-Hyper Sonics
-Modern CBRNE
-Network Jamming / spoofing

Range greater than 200 NM

Asset 1 Payload: 4000 lbs (more numbers)
Asset 2 Payload: 16000 lbs (limited numbers)

System 1: 3400 lbs (Infantry SQD)
System 2: 8500 lbs (ISV)
System 3: 6500 lbs (M119A3)
System 4: 10000 lbs (M777 without crew or rounds)

Solution Example: Aircraft signature masking system?

Reach Out TO

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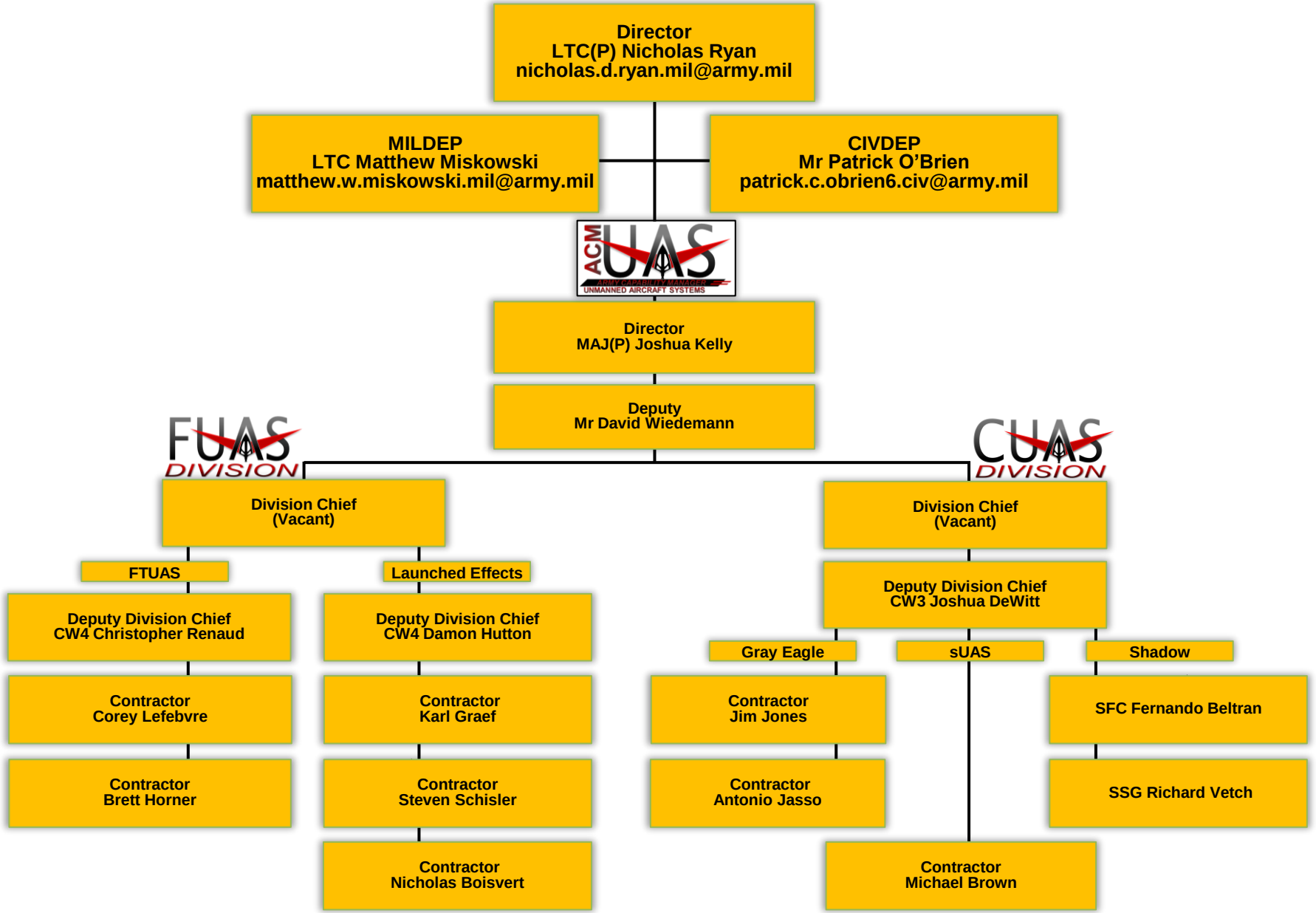
COL Danielle Medaglia - PM UAS

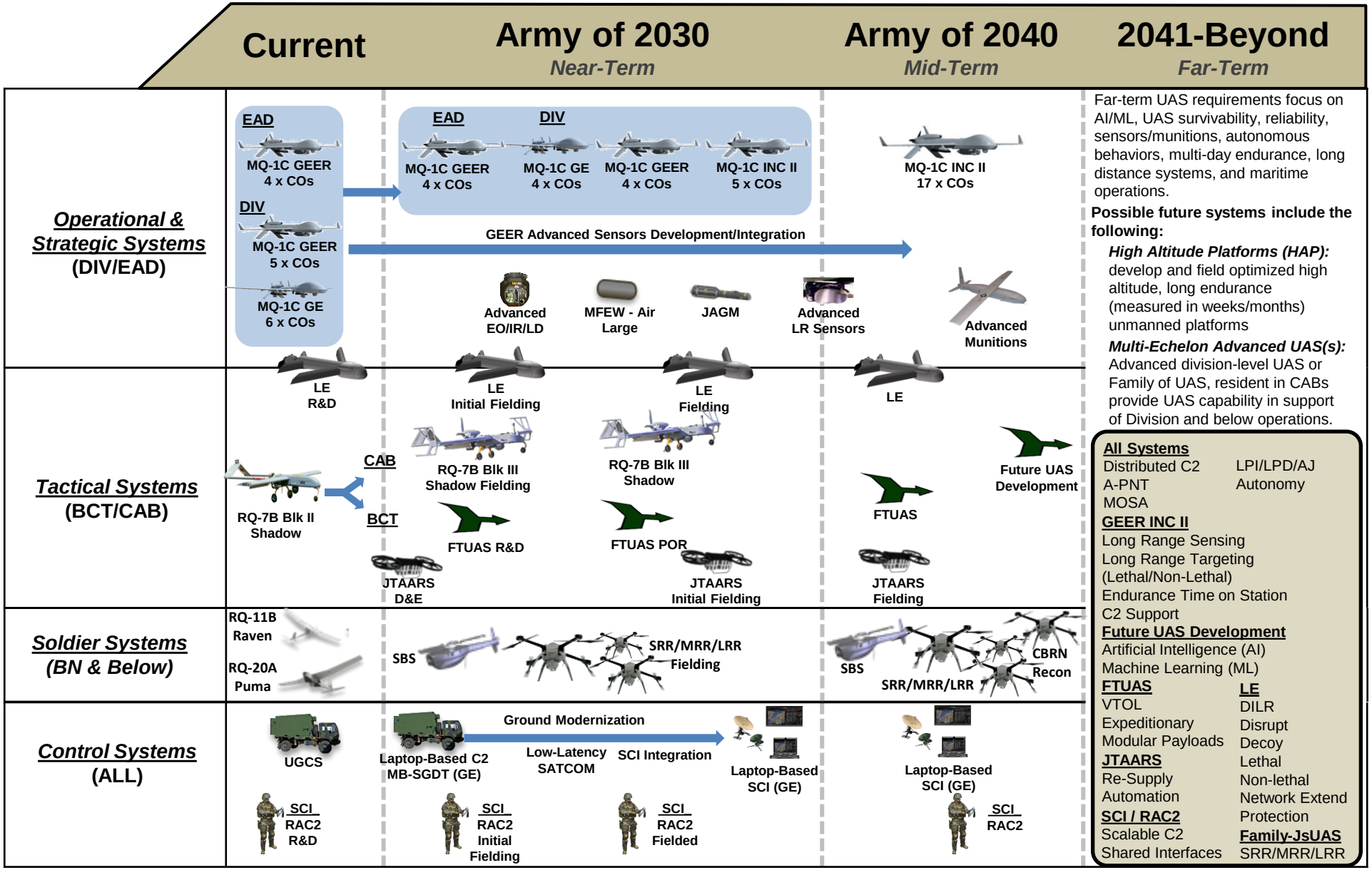
LTC(P) Nick RyaN - ACM-UAS (AP-RDD)

UAS Update

AP-RDD / ACM-UAS



UAS Road to MDO



Far-term UAS requirements focus on AI/ML, UAS survivability, reliability, sensors/munitions, autonomous behaviors, multi-day endurance, long distance systems, and maritime operations.

Possible future systems include the following:

- ***High Altitude Platforms (HAP):*** develop and field optimized high altitude, long endurance (measured in weeks/months) unmanned platforms
- ***Multi-Echelon Advanced UAS(s):*** Advanced division-level UAS or Family of UAS, resident in CABs provide UAS capability in support of Division and below operations.

All Systems
Distributed C2
A-PNT
MOSA
LPI/LPD/AJ
Autonomy

GEER INC II
Long Range Sensing
Long Range Targeting (Lethal/Non-Lethal)
Endurance Time on Station
C2 Support

Future UAS Development
Artificial Intelligence (AI)
Machine Learning (ML)

FTUAS
VTOL
Expeditionary
Modular Payloads

LE
DILR
Disrupt
Decoy
Lethal
Non-lethal
Network Extend
Protection

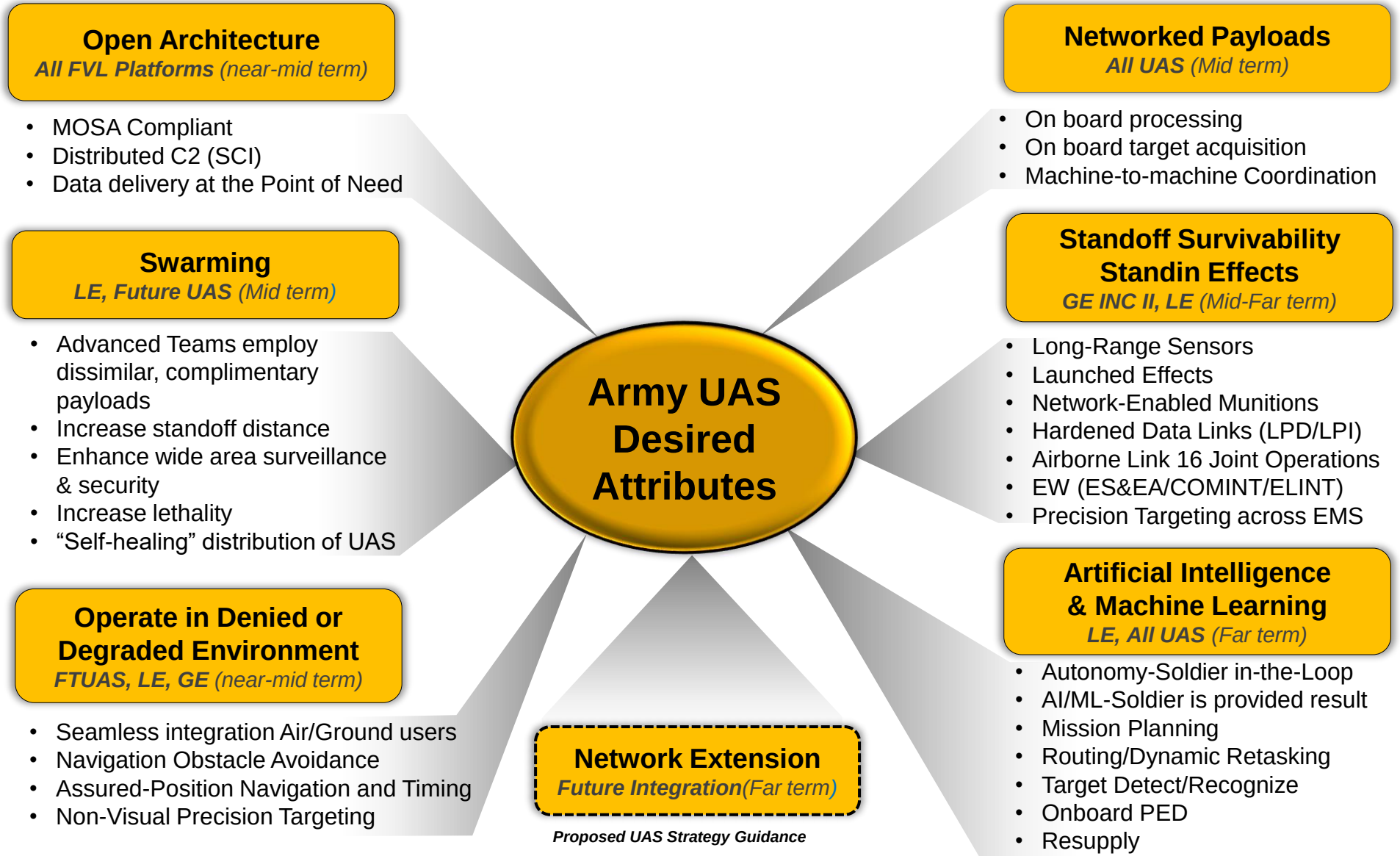
JTAARS
Re-Supply
Automation

SCI / RAC2
Scalable C2
Shared Interfaces

Family-JsUAS
SRR/MRR/LRR

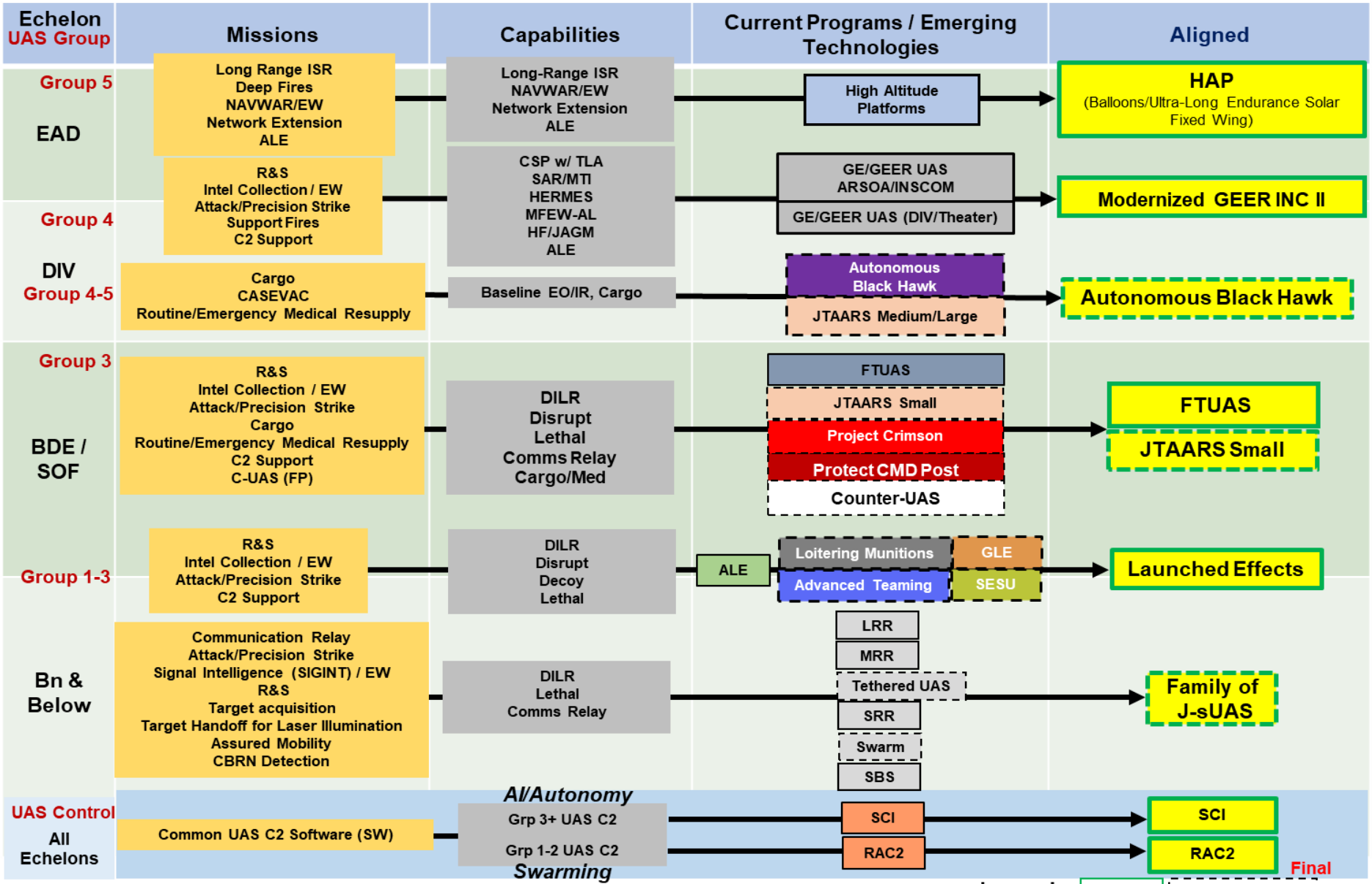
Solutions to UAS requirements will be aspirational but must be resource informed.

Desired UAS Capabilities



Proposed UAS Strategy Guidance

Planned UAS Alignment
(Version 12)



Welcome to the 2023 Army Aviation Industry Days

"HONORING THE PAST - TRANSFORMING FOR THE FUTURE"