

Headquarters U.S. Air Force

Integrity - Service - Excellence

AF UAS Flight Plan 2009-2047



**Colonel Eric Mathewson
AF UAS Task Force**

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Assumptions

- **Manned and unmanned systems must be integrated to increase capability across the full range of military operations for the Joint Force**
- **UAS compelling where the human is a limitation to mission success**
- **Automation is key to increasing effects, while potentially reducing cost, forward footprint and risk**
- **The desired effect is a product of the “integrated system” (payload, network, and PED); and less the particular platform (truck)**
- **Modular systems with standardized interfaces enhance adaptability, sustainability and reduce cost**
- **Robust, agile, redundant C2 enables supervisory control (“man on the loop”)**
- **DOTMLPF-P solutions are linked and must be synchronized**



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Autonomy



Conventional Harbor

- 4 operators per crane
- Manpower-centric system
 - Legacy system
 - Manpower dependant
 - Manual Operation



“Multi-Crane Control”

- 1 operator per 6 cranes
 - 24x increase in efficiency
- Tech-centric system
 - Multi-crane Control
 - Automation (cranes and AGV)
 - DGPS
 - Algorithms

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Autonomy – Multi-Aircraft Control Potential Manpower Savings

2011
(Current system)

- 50 CAPs
 - 50 MQ-9 CAPs
 - + 7 a/c in constant transit
 - 10 pilots per CAP
 - 500 pilots required
 - + 70 pilots to transit a/c
- 570 Total Pilots**

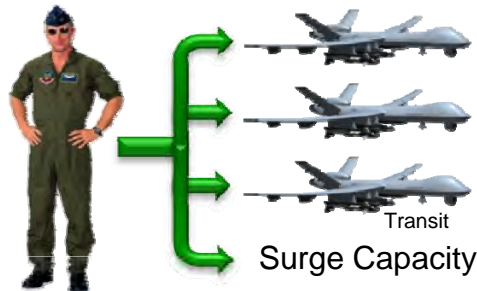


2012
(MAC)

- 50 CAPs
 - 50 MQ-9 CAPs
 - 2 CAPs per MAC GCS
 - 1 transit per MAC GCS
- 5 pilots per CAP
 - 250 Pilots required
 - + 0 to transit aircraft

250 Total Pilots

56% Manpower Savings



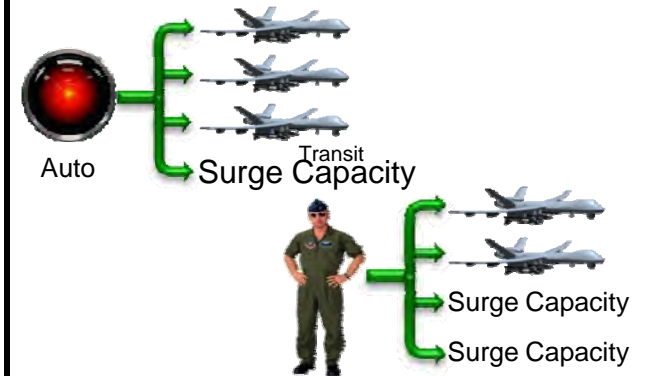
MAC = 1 pilot can fly up to 4 a/c

TBD
(MAC + 50% auto)

- 50 CAPs
 - 50 MQ-9 CAPs on orbit
- 25 CAPs automated
- 25 CAPs in MAC (5 pilots/CAP)
 - 125 pilots required
 - + 25 auto-msn monitor pilots
 - + 0 to transit aircraft

150 Total Pilots

64% Manpower Savings





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Modularity

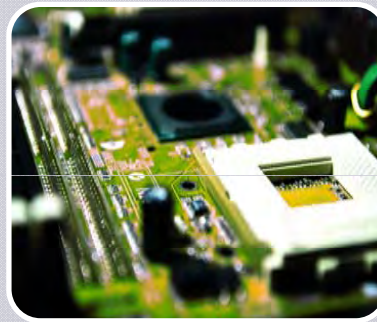
Effective



B-52

- Standard Interfaces
- Variable / Tailorable armament set
- JFC Mission Flexibility
 - Conventional/nuclear
 - Stand-off strike, CAS

Affordable



PCs

- Standard interface/bus
- Swappable components
- Promotes vendor competition
- Drives down price, improves quality, allows for tailorability
- \$399 PCs are reality

Flexible



C-130

- One platform/truck
- Supports multiple missions
- Swappable modules

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AMC-X CONCEPT CAPABILITIES STUDY



Common components, similar shape, and same production line

Enabling the “Global” in “Global Vigilance, Reach and Power!”

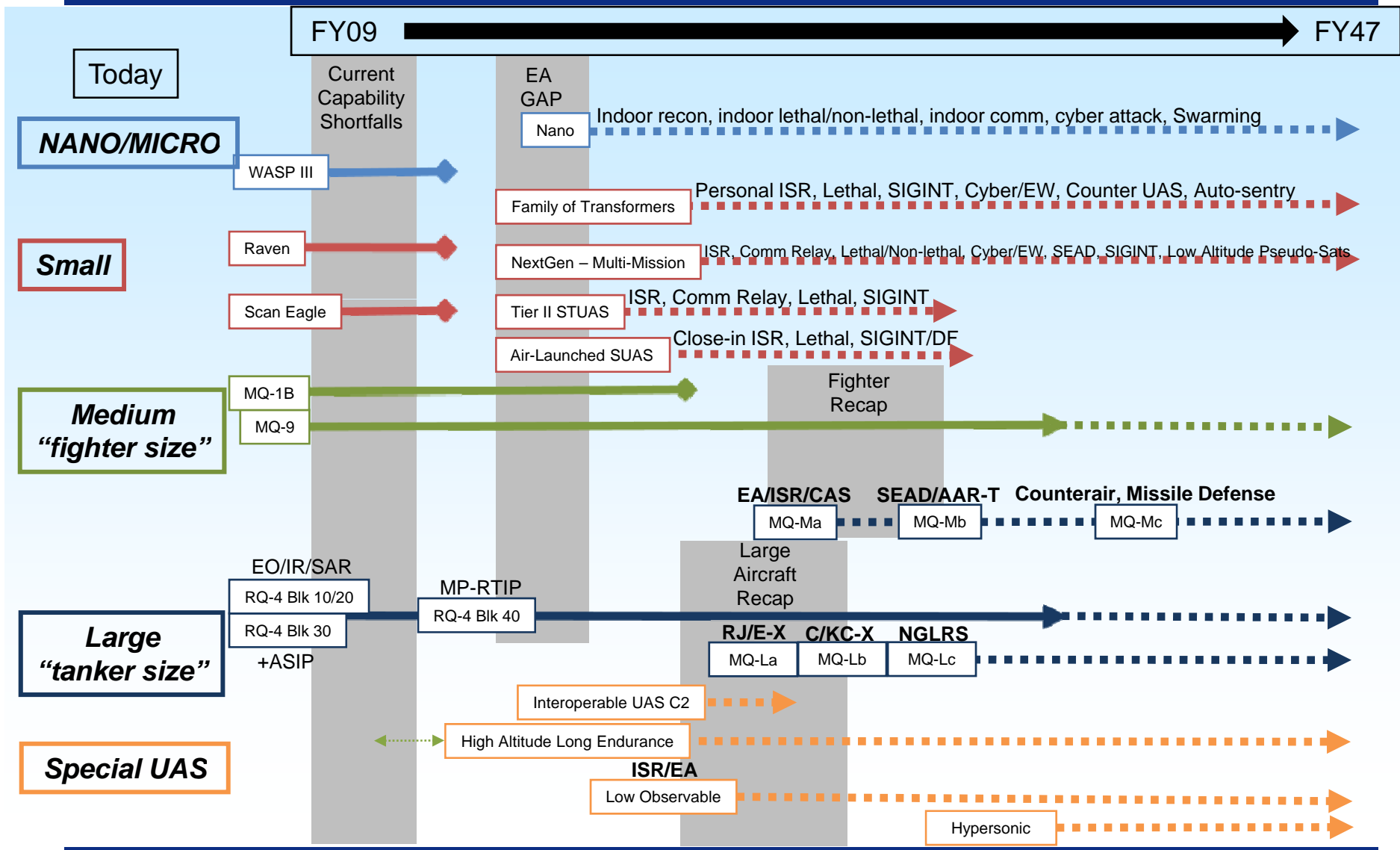


How do we get there?

- **Methodology**
 - **Identified where we are today**
 - **Examined future scenarios and desired capabilities**
 - **From that future perspective identified actions to get there from today**
 - **Matched compelling requirements to UAS capabilities aligned with AF Core Functions**
 - **Identified and sequenced actions addressing not only materiel solutions, but also the doctrine, organization, training, facilities and policy**

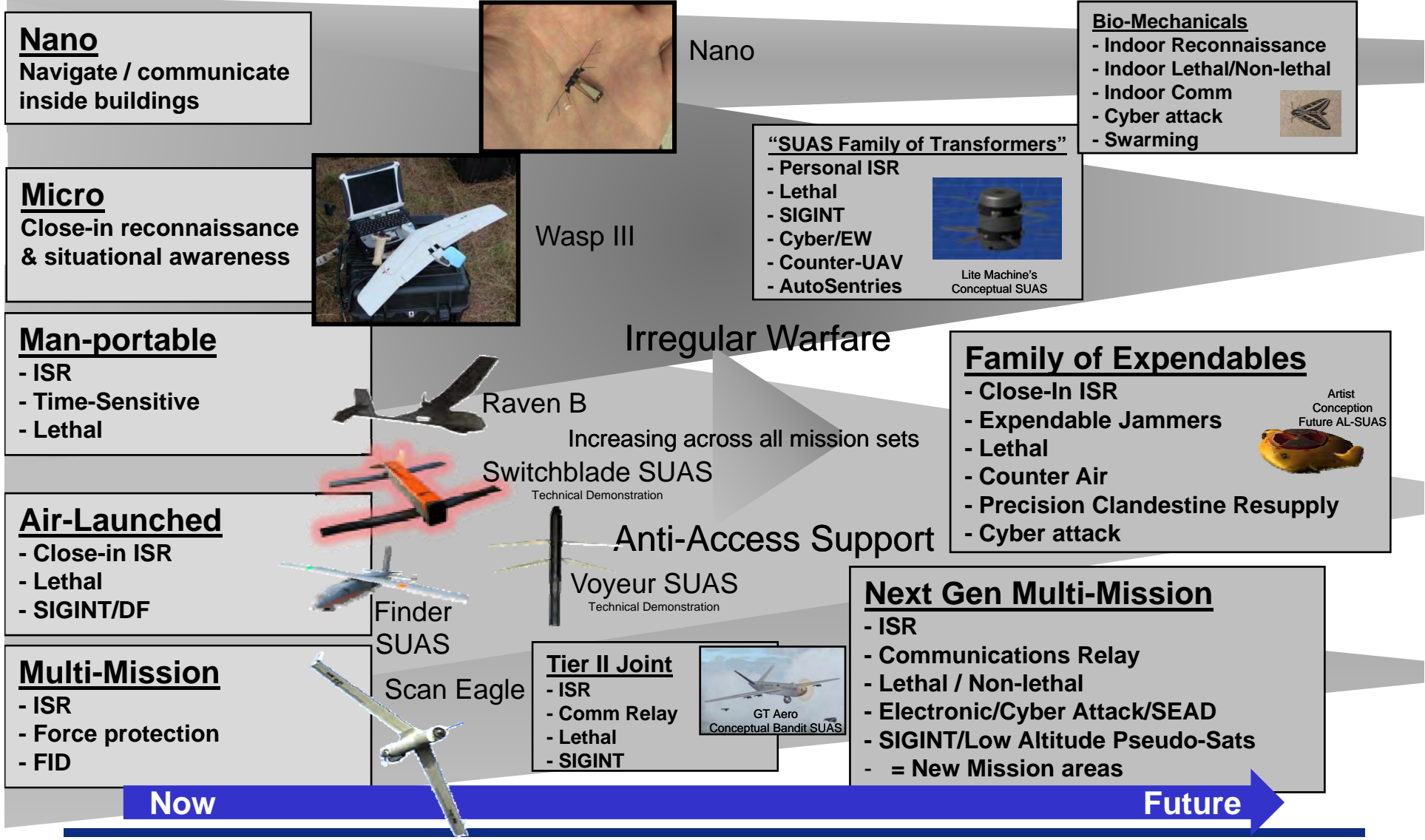


AF UAS Flight Plan: Mission sets for UAS



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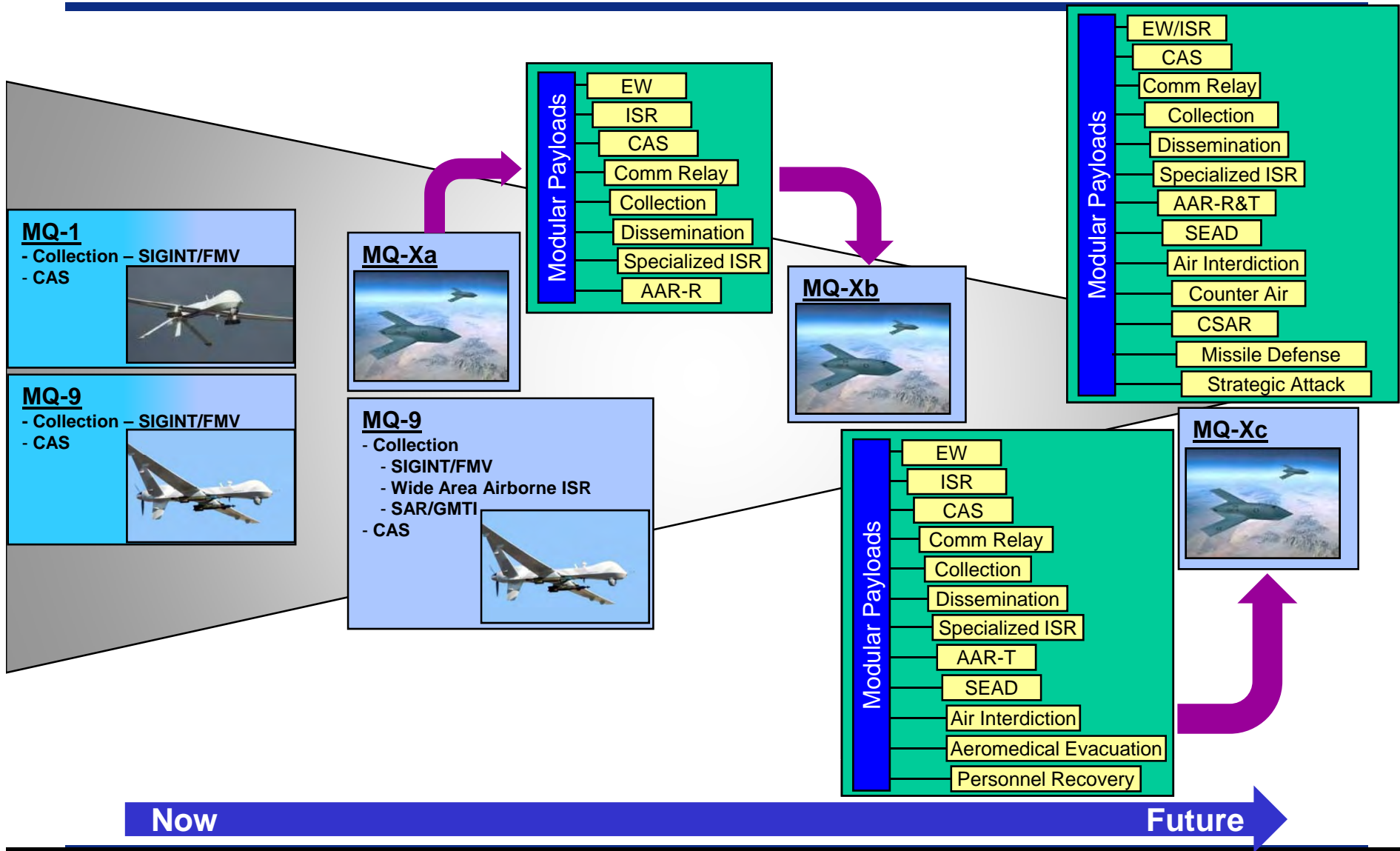
SUAS "Family of Systems"





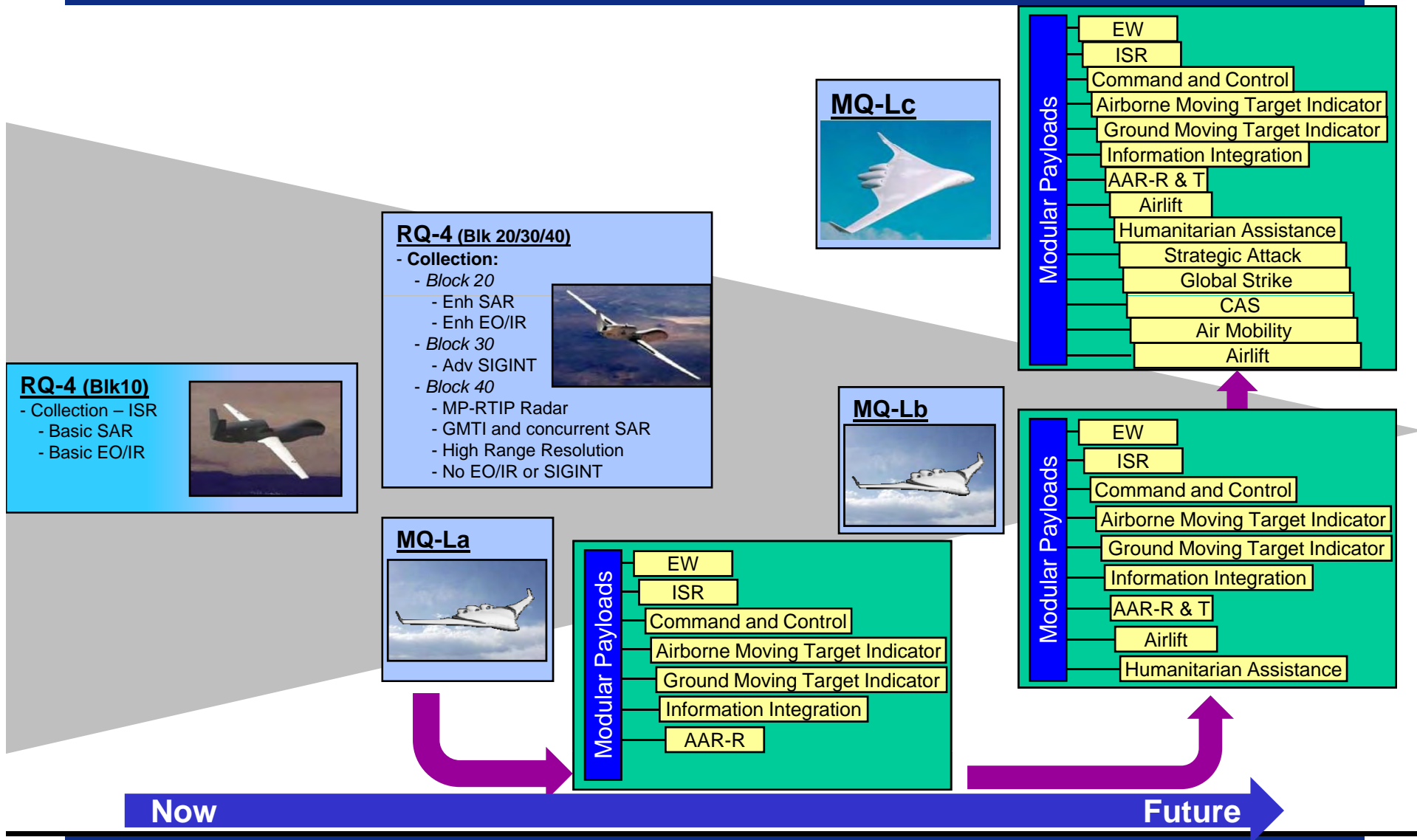
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Medium "System"



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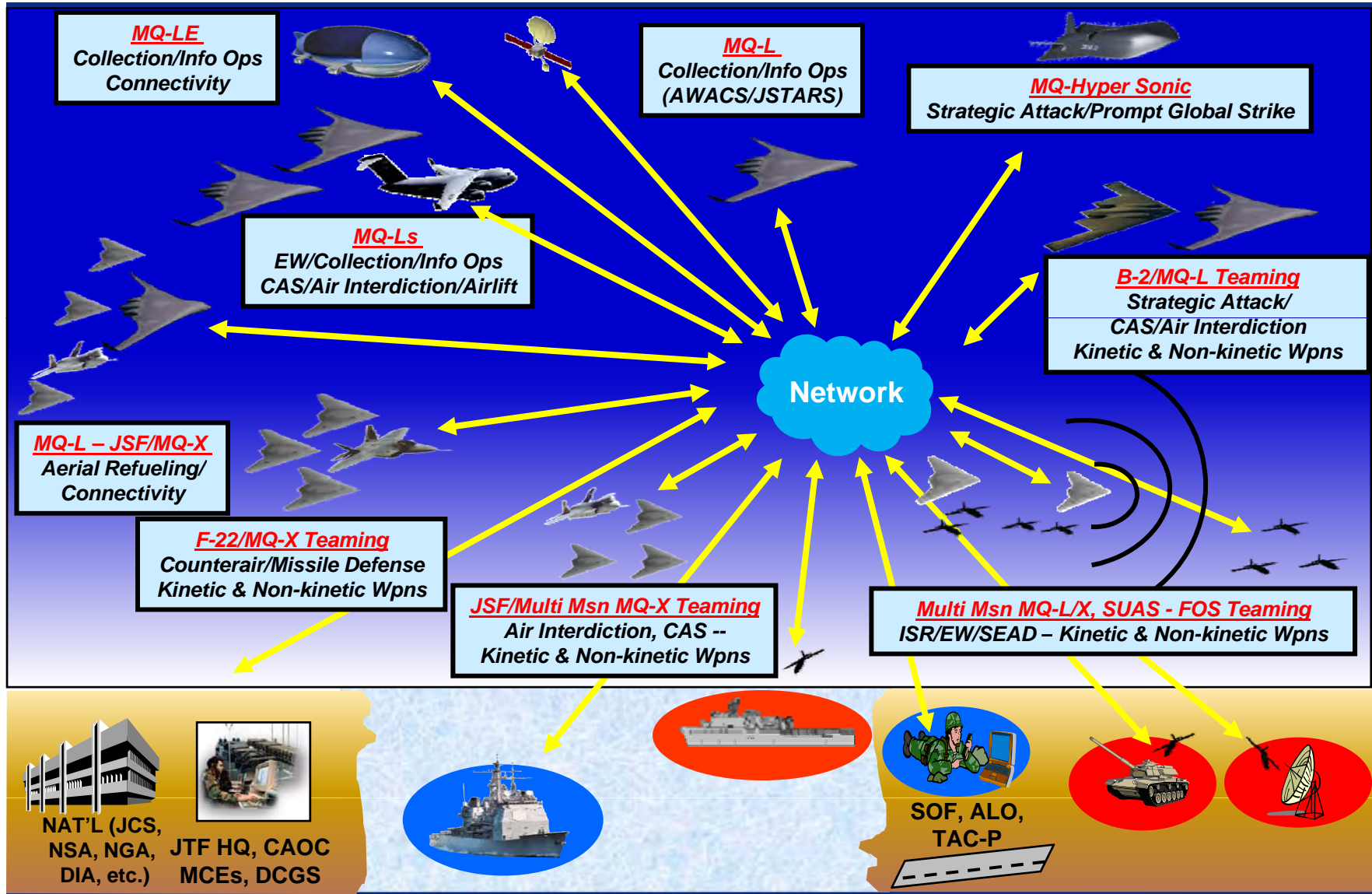
Large "System"





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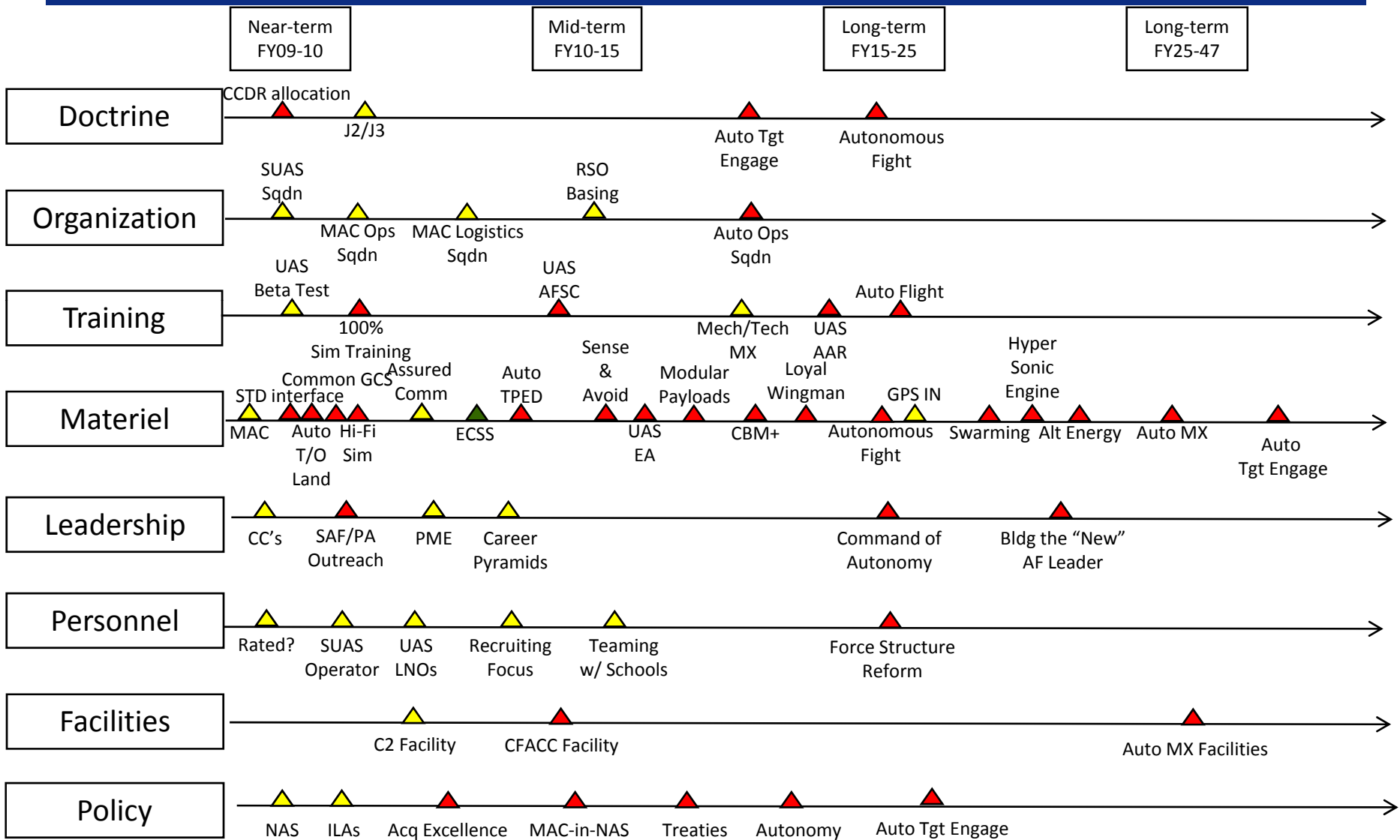
Connectivity and Teaming Future



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Action Synchronization



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AF UAS Flight Plan Vision

- **An Air Force where unmanned aircraft systems are considered as viable alternatives to traditionally manned platforms**
- **An Air Force that harnesses increasingly automated, modular and sustainable systems resulting in a leaner, more adaptable, tailorable, and efficient force that maximizes combat capabilities to the Joint Force**
- **An Air Force that teams with the other Services, our allies, academia and industry to capitalize on the unique unmanned aircraft attributes of persistence, connectivity, flexibility, autonomy, and efficiency**



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BACK UPS

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USAF UAS Vision: Definitions

Theater-Capable UAS

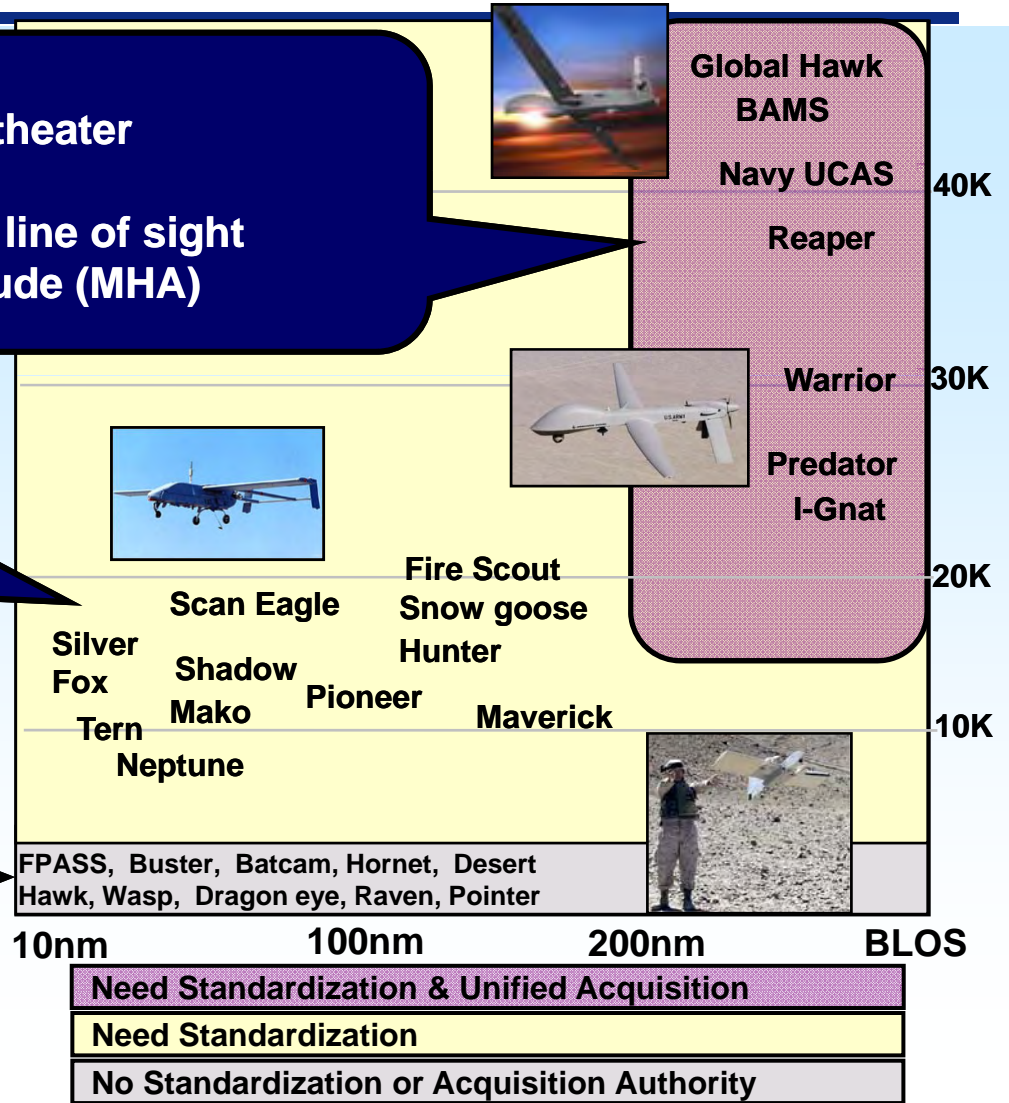
- Can operate across theater
- Long range UAS
- Can operate beyond line of sight
- Medium & High Altitude (MHA)

Local-Effects UAS

- Delivers local effects
- Short-range UAS
- Operates within line-of-sight

Low-Altitude UAS

- Operates in procedurally controlled airspace (below coordinating altitude)



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USAF UAS Vision: Optimizing UAS Employment

- Theater-Capable UAS (low-density / high-demand resource)
 - Prioritized by Joint Force Commander (JFC)
 - Executed by JFC's Joint Force Air Component Commander

- Local-Capable UAS (unlimited resource)
 - Prioritized by assigned unit commanders
 - Controlled by assigned unit commanders
 - IF flown in controlled airspace must be integrated into theater airspace plan

Treating theater-capable UAS as local-effects assets sub-optimizes the resources and combat effects available to the Joint Force Commander

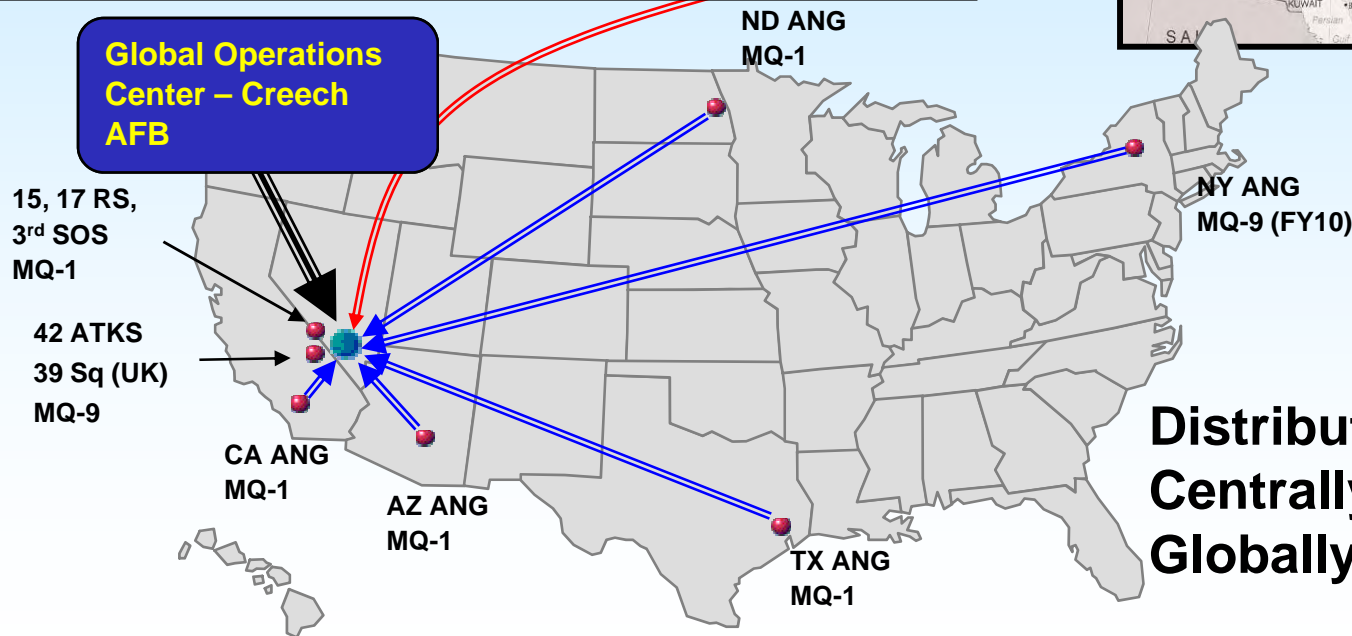
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USAF UAS Vision: Remote Split Operations

Total Force Operations
 Active Duty, Reserve, National Guard,
 Special Operations, United Kingdom
 6 - Stateside operations centers
 5 - Launch and recovery units in theater

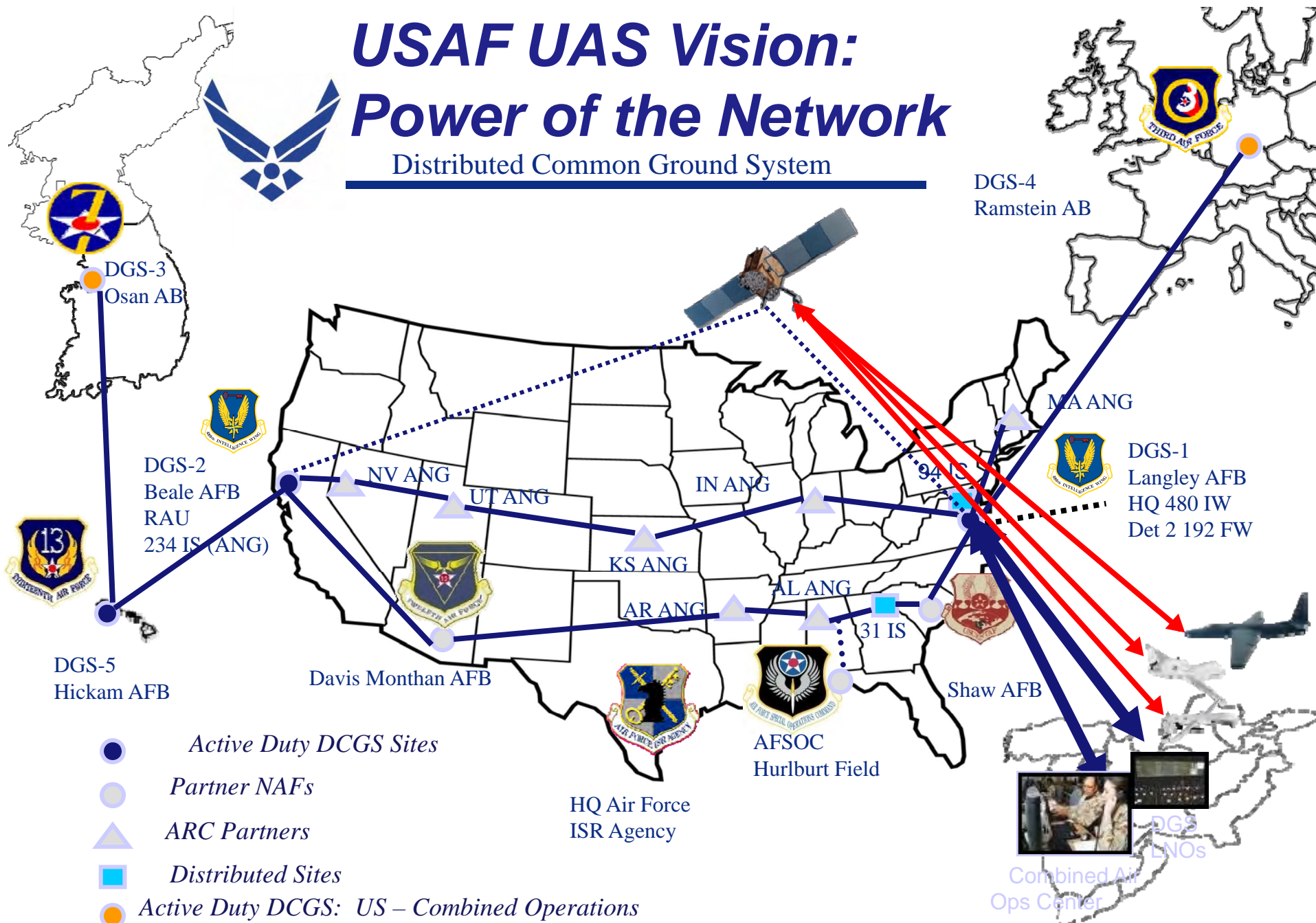


**Distributed Operations
Centrally Coordinated
Globally Applied**

**Over 1,000 personnel flying Combat Operations not in harms way;
Projecting Power without Projecting Vulnerability**

USAF UAS Vision: Power of the Network

Distributed Common Ground System



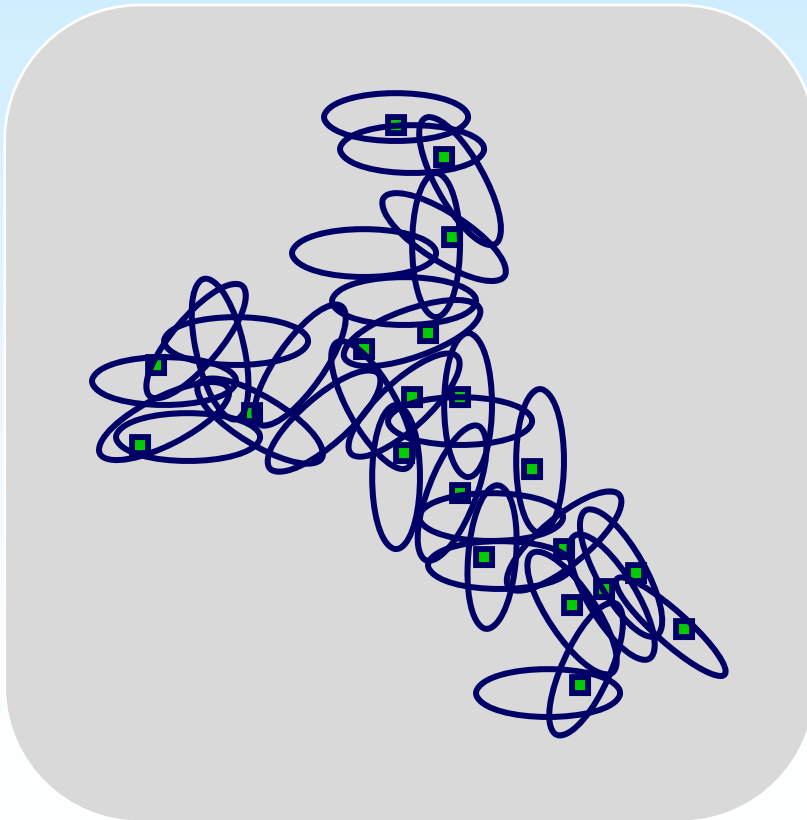
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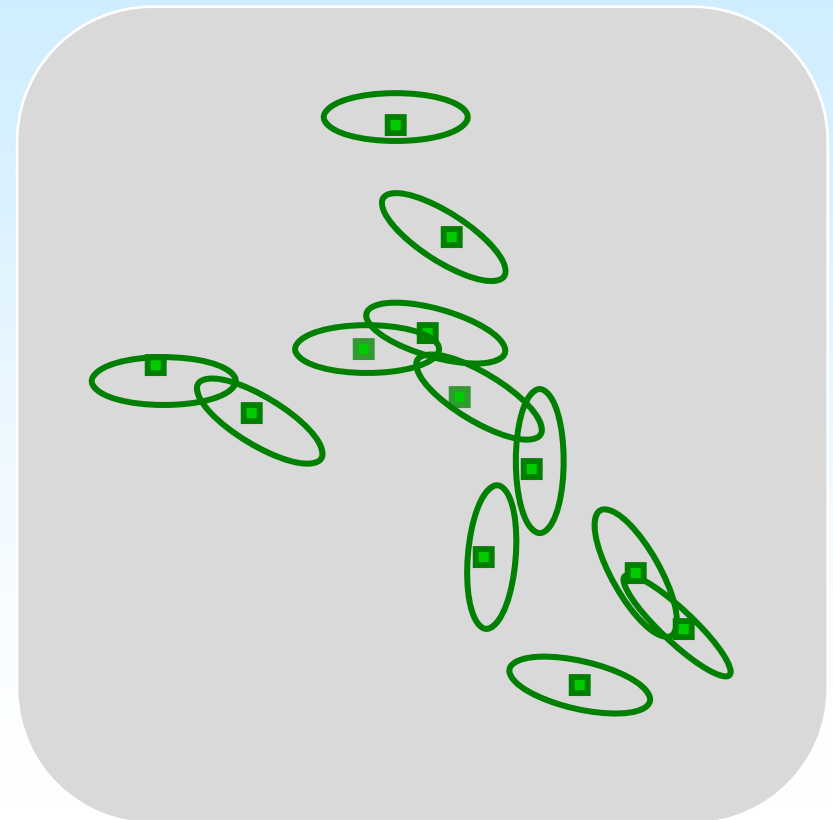
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The Importance of CONOPs: *132 UAVs Supporting 4 Divisions*

Remote Split-Ops Concept
= 34 CAPs



Organic Concept
= 12 CAPs



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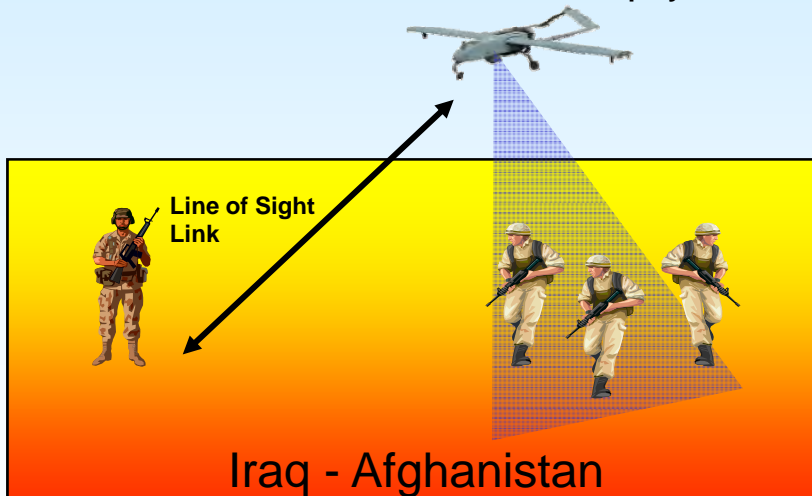


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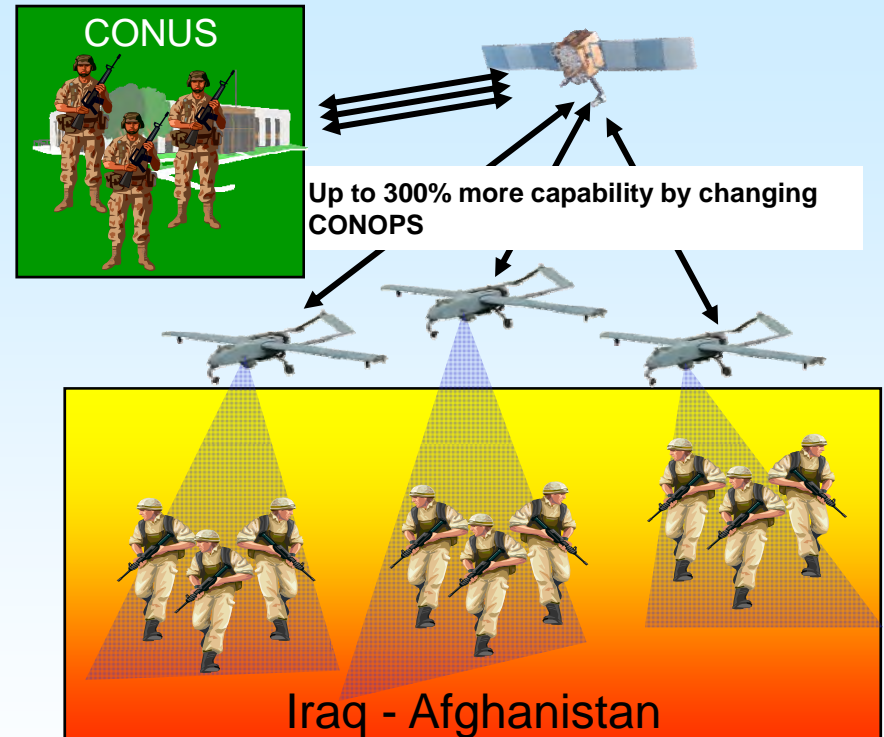
Shadow RSO Demonstration

Organic Assignment

30-40% of available Shadows employed...



Remote Split Ops (RSO)



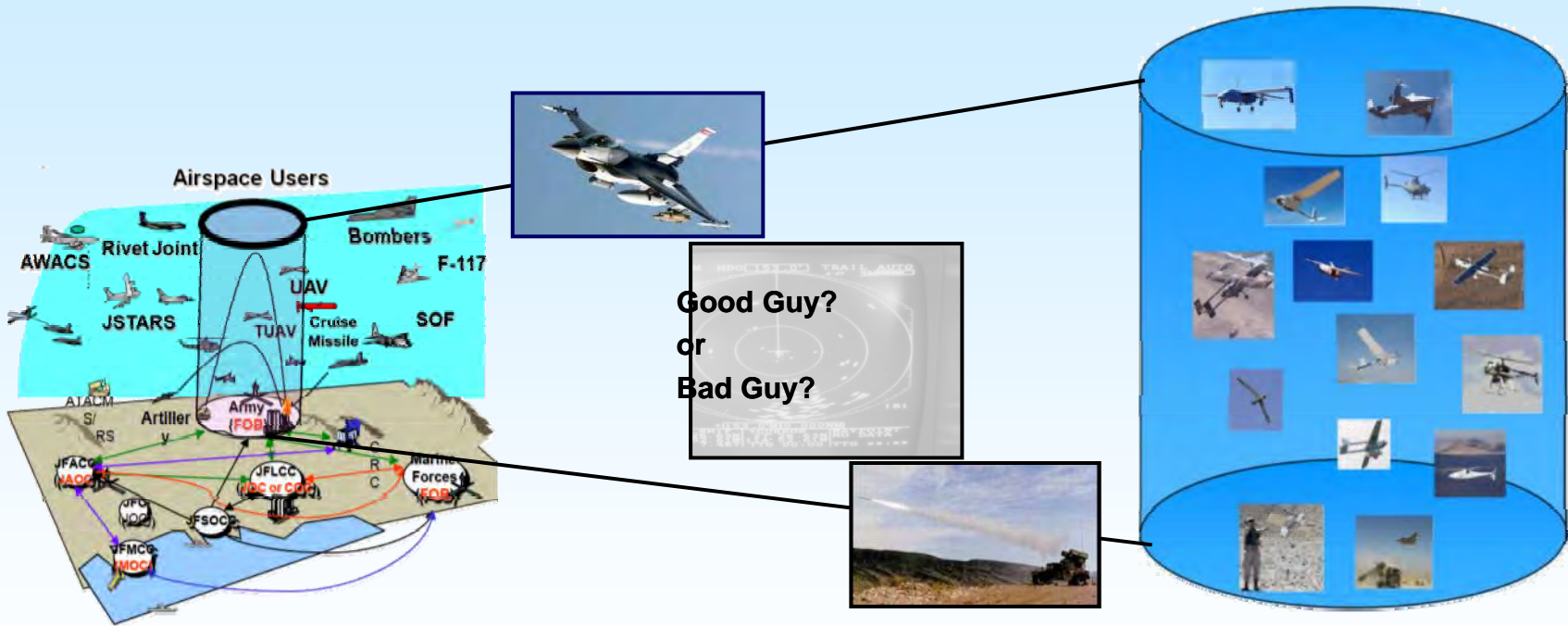
- Air Force funded joint Army/ AF demo for RSO Shadow ops conducted on 26 June 2008
- Shadow launched from China Lake, CA....controlled from Ft. Belvoir, VA...2500NM away
- Potential for RSO applied by Army to enable significant increase of FMV capability with fewer troops in the AOR



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USAF UAS Vision: Joint Airspace Control and Defense

Inability to rapidly ID & provide airspace clearance will result in failure to engage enemy forces...or fratricide



“So far we have been fortunate. What I worry about is the day I have a C-130 with a cargo load of soldiers, and a UAV comes right through the cockpit windshield.”
USCENTCOM CFACC



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USAF UAS Vision: Standardization & Single Acquisition Authority

Standardization Delivers:

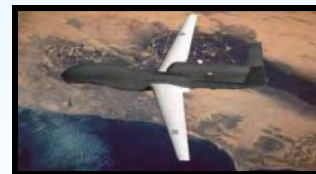
- Integrated capability
- Joint training & certification standards
- Shared information
- Common architectures
- Elimination of equipment seams
- Uniform DoD requirement to industry, interagency, and allies



**Air Force
Predator**



**Army
Warrior**



**Air Force
Global Hawk**



**Navy
BAMS***

Single Acquisition Authority:

- Reduces duplication
- Ensures commonality of investment
- Agile response to urgent needs
- Improved logistics & life cycle
- Fields systems faster

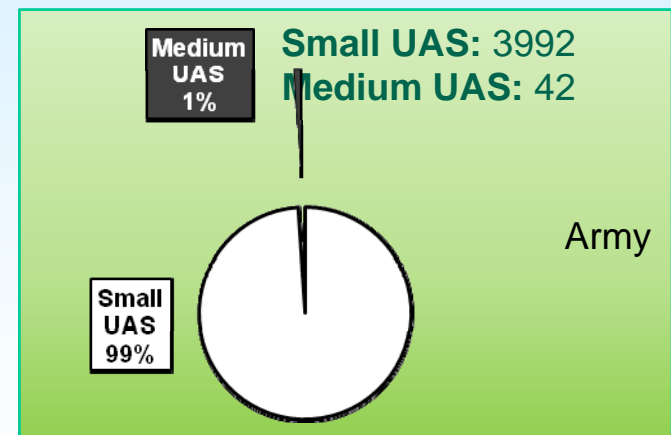
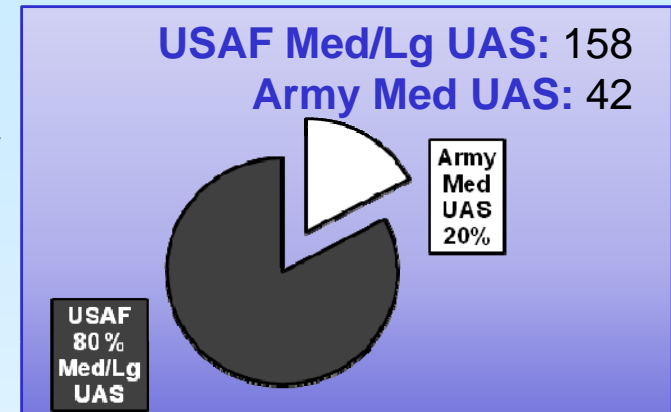
We can't afford multiple UAS program offices, independent training, logistics and maintenance operations, plus multiple support facilities and procurement contracts



Perspectives on UAS Operators

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- Exploring alternatives to operate UAS to meet: increased UAS demand; rated management challenges; and appropriate levels of responsibility
 - Current Beta Test for UAS Operators:
 - Flight screening at Pueblo
 - Instrument training at Randolph
 - UAS fundamentals at Randolph
 - Joint firepower course at Nellis
 - FTU at Creech
 - 100 SUPT grads / yr
- FAA, ICAO, and DOD, regulatory and safety requirements same for UAVs as manned aircraft
- Level of responsibility should dictate level of qualification in combat

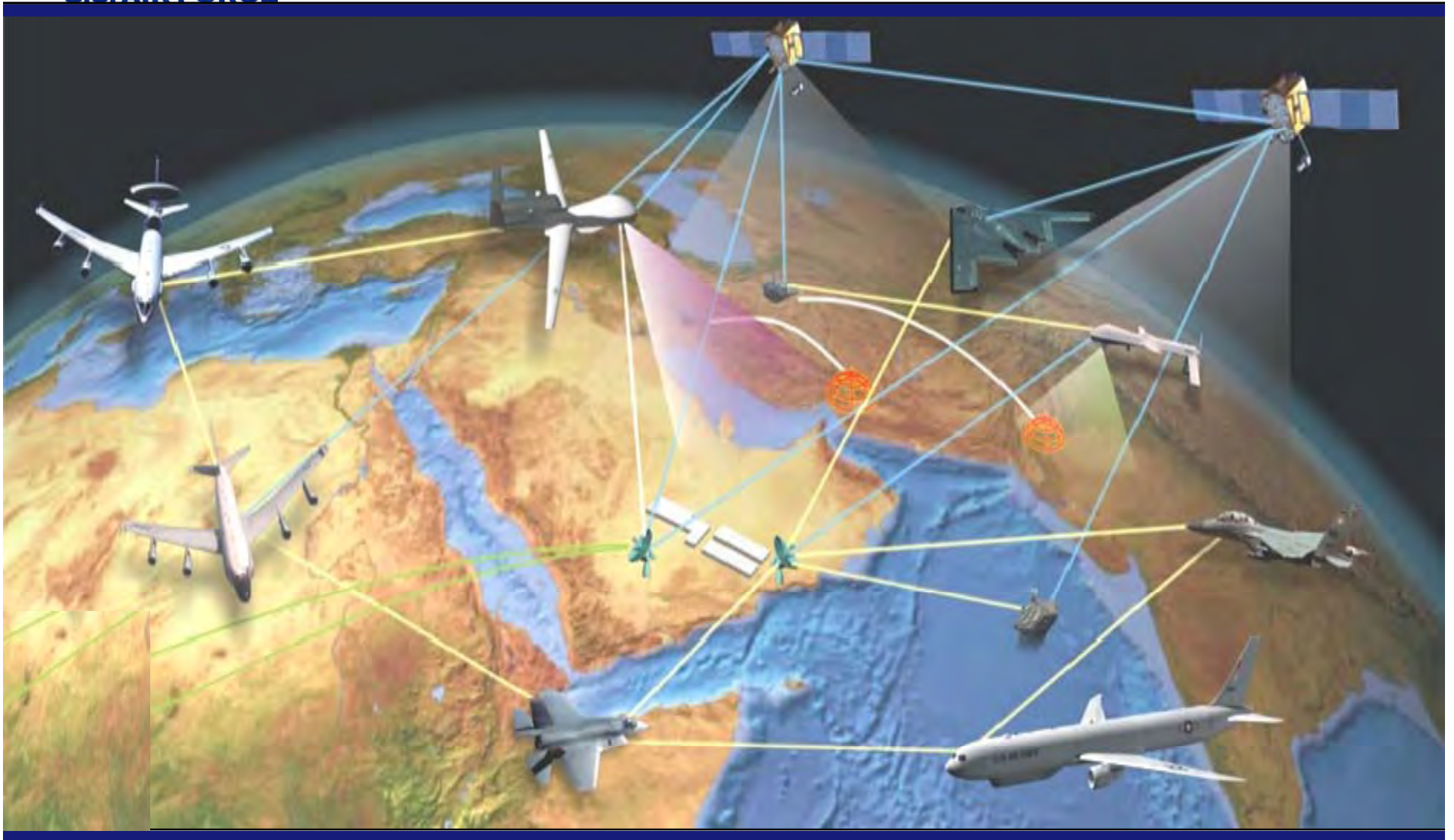


Increased Demand, Limited Rated Inventory, Current FAA/ICAO Regulations, and Training Commensurate With Implications of Employment—Require New Approach



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Air Force ISR Surge

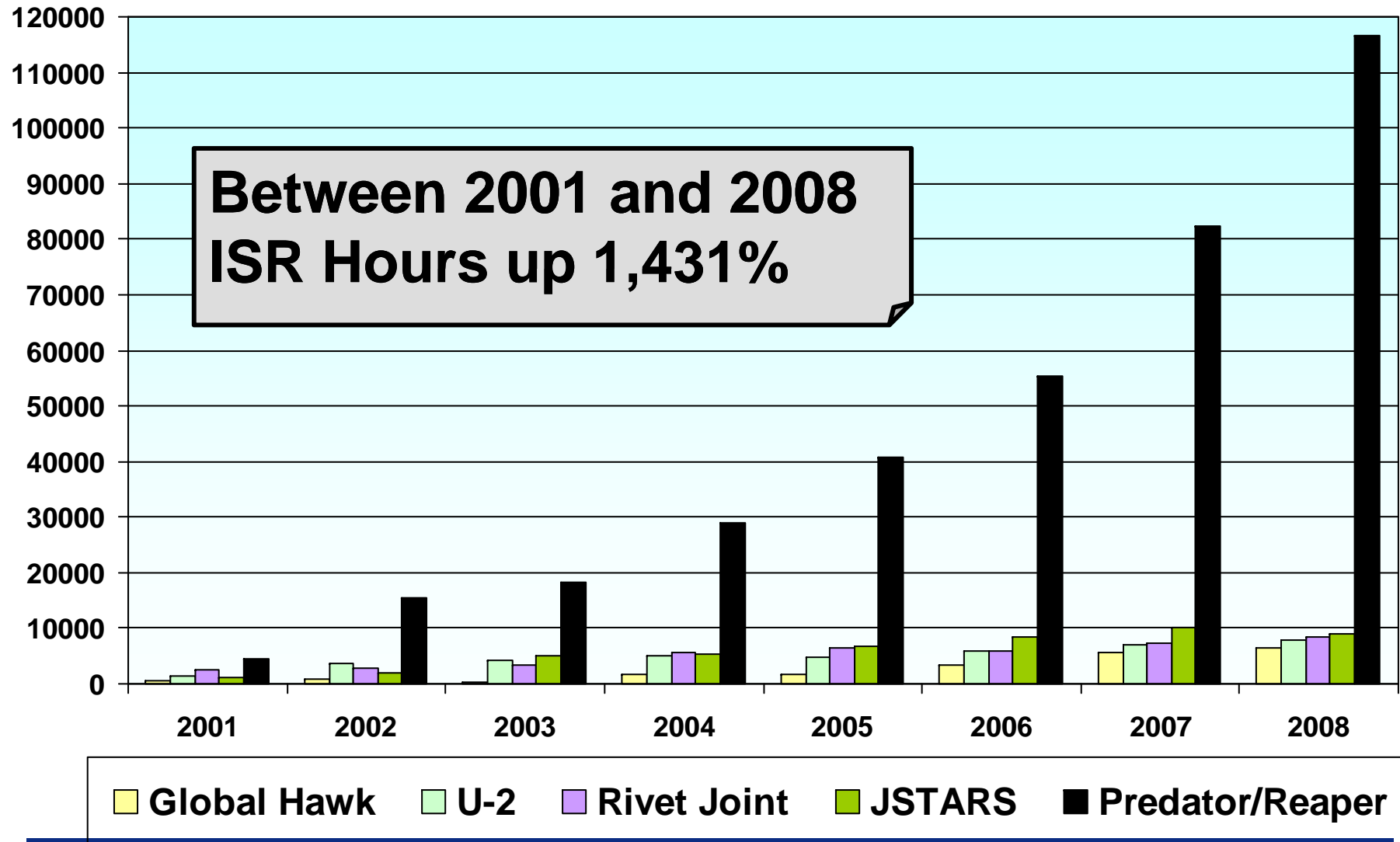


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CENTCOM ISR Coverage

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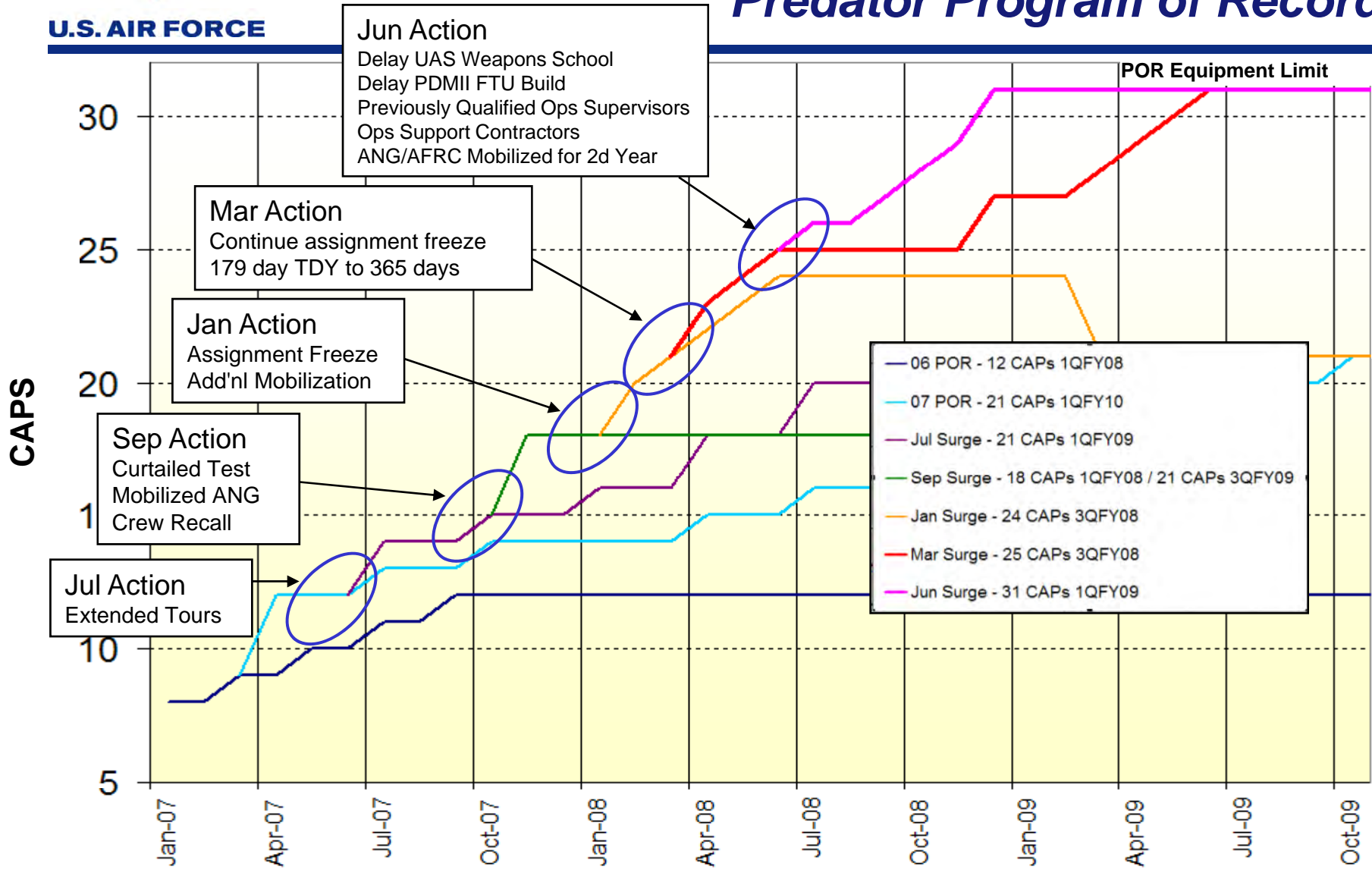


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AF ISR "Surge" Predator Program of Record

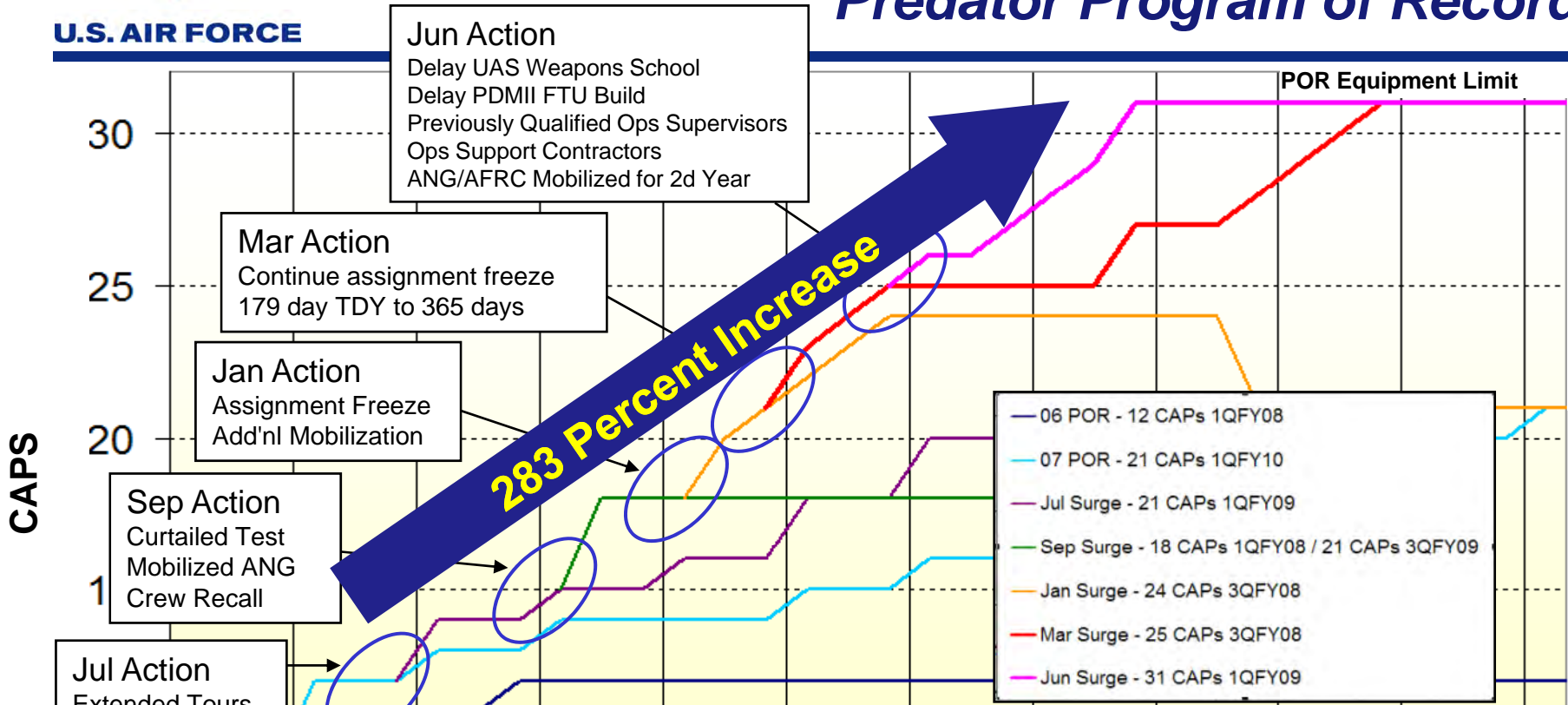
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AF ISR "Surge" Predator Program of Record



35 MQ-1/9 CAPs in-place 6 Months before planned 21 MQ-1 CAPs of DoD program of record...Over 280% growth in 18 months...

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Way Ahead to Meet Increasing Demand

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- **AF Shifting to all MQ-9 procurement:**
 - **600% more payload capability**
 - **250 knots vice 120 knots**
 - **Adjusted FY 08 and FY 09 Supplementals from MQ-1 to MQ-9**
 - **Will complete MQ-1 FY 08 and 09 procurement/shift to MQ-9 only in FY 10**
 - **Developing/fielding a new Wide Area Airborne Surveillance (WAAS) sensor**
 - **MQ-9 capable of carrying WAAS pod—MQ-1 not capable**
 - **Increases the effectiveness of individual CAPs by over 1,200% initially**
 - **Eventually increasing the effectiveness to over 6,000% from where we are today with the Predator MQ-1**

MQ-9, with nearly twice the performance of the MQ-1 and nearly 10 times the external payload—matched up with Wide Area Airborne Surveillance system, will deliver 13 to eventually 60 times more capability than MQ-1 series UAS

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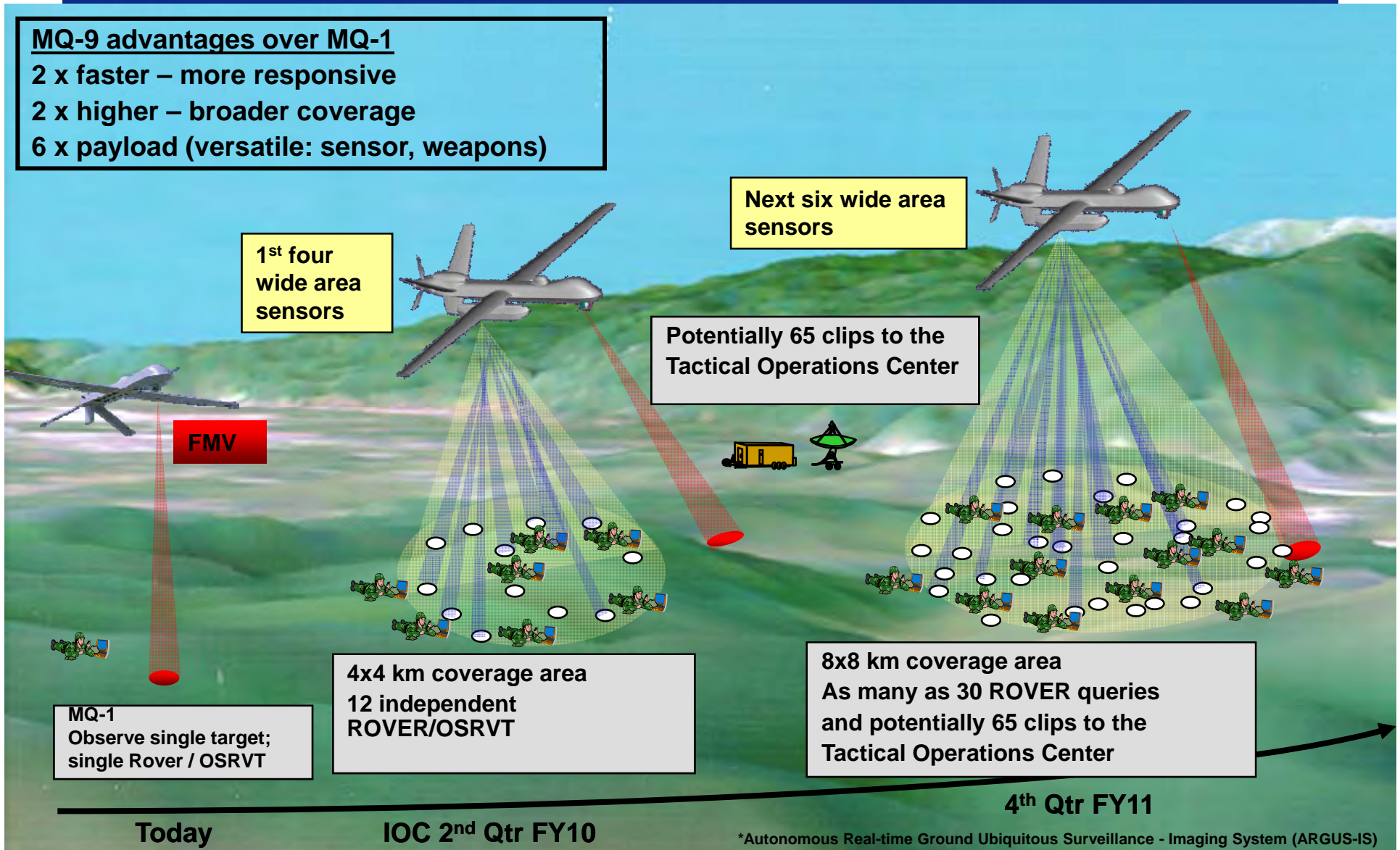


Increasing Capabilities Wide Area Airborne Surveillance (WAAS)

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MQ-9 advantages over MQ-1

- 2 x faster – more responsive
- 2 x higher – broader coverage
- 6 x payload (versatile: sensor, weapons)

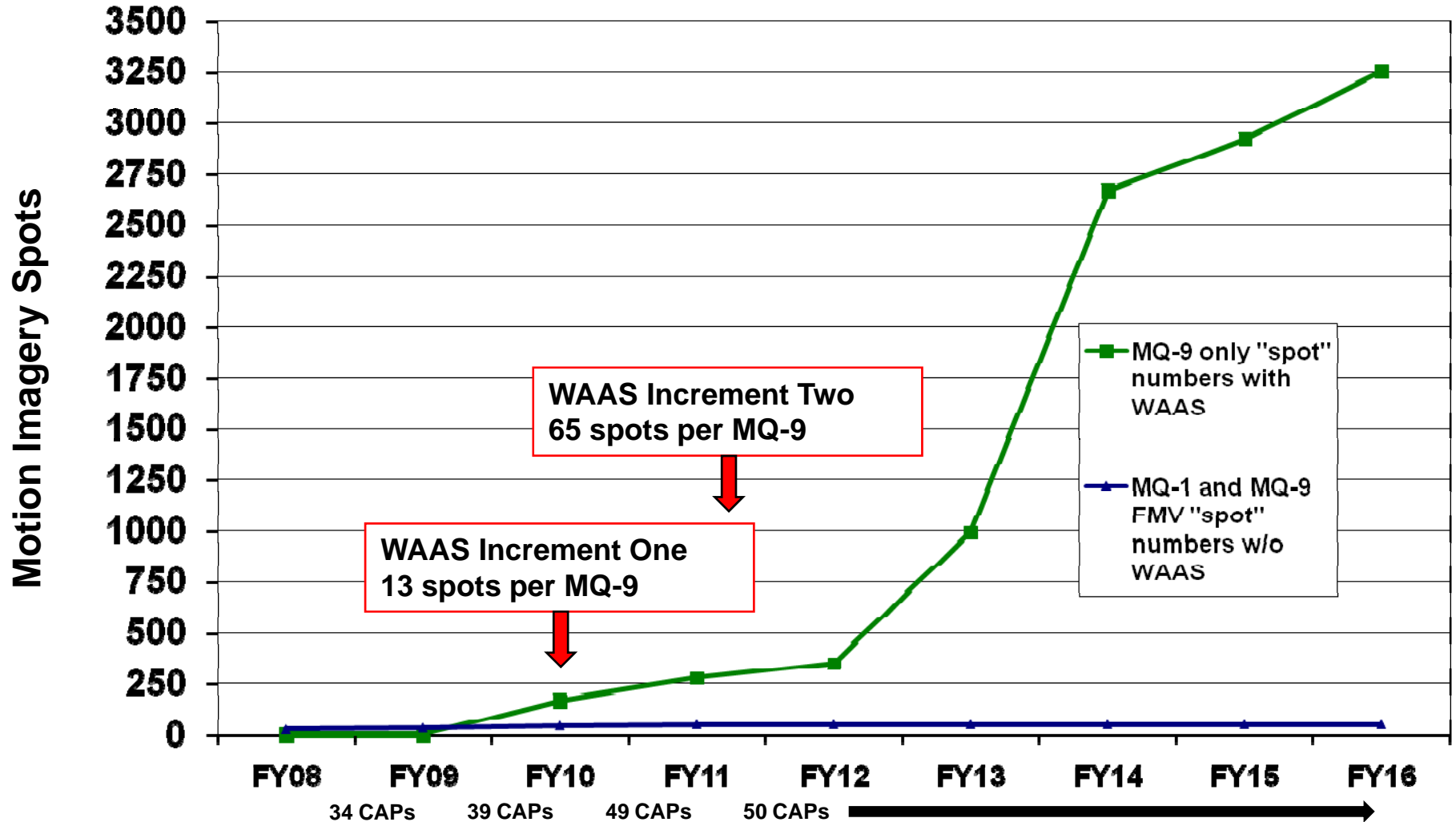




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Potential Growth of Video Effect

(Result of MQ-1 to MQ-9 Shift w/WAAS)



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USAF UAS Vision: Joint Employment

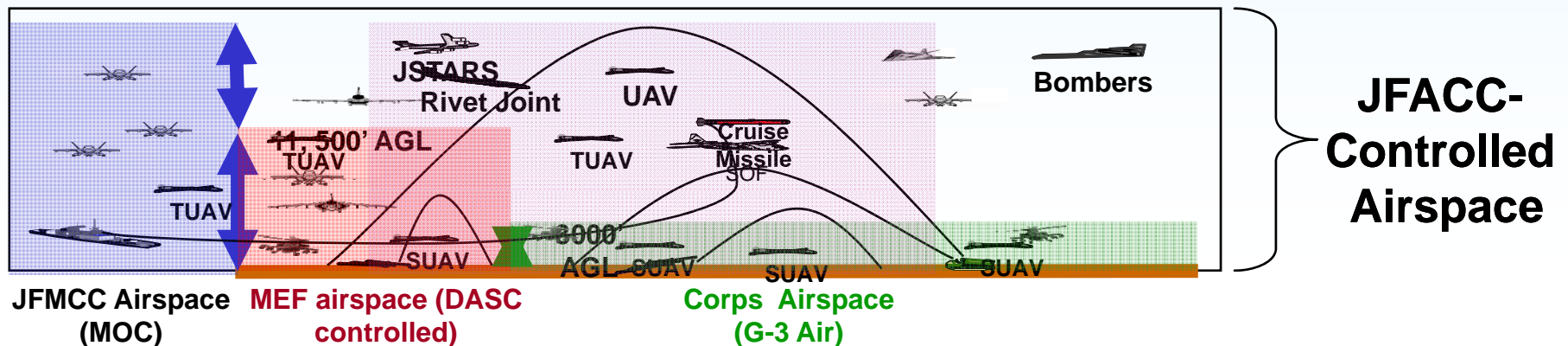
- Organizing air ops by individual service components creates seams
- So Joint Doctrine established a joint functional component for air operations: to integrate airspace, air defense, and effects from the air in accordance with the Joint Force Commander's priorities

TODAY:

“We are confusing the joint battlespace doctrine. Air Component Commanders should coordinate all UAVs based on Combatant Commander situational war-fighting directives.”

“Primary control of these assets should be exercised by centralized Joint Air Component command and control.”

General Barry R. McCaffrey, USA (Ret)



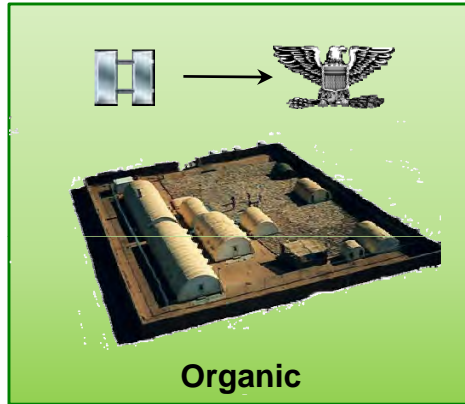


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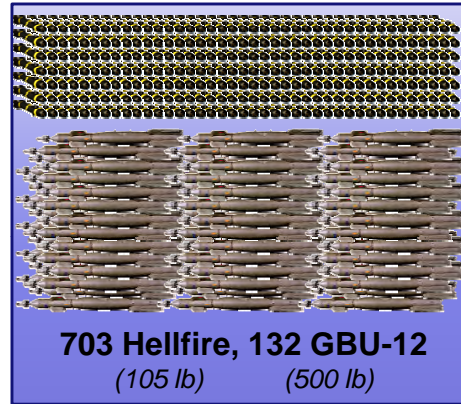
Service Distinctions

Air Force: blue/left Army: green/right

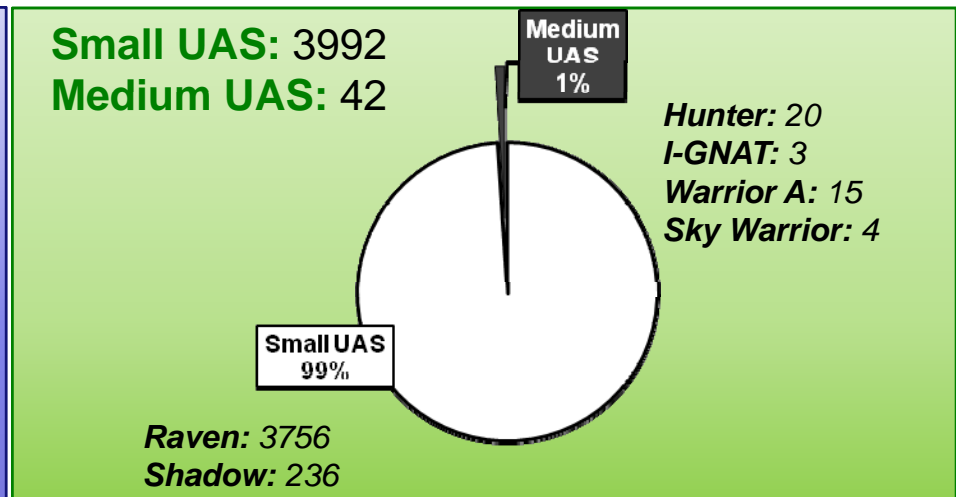
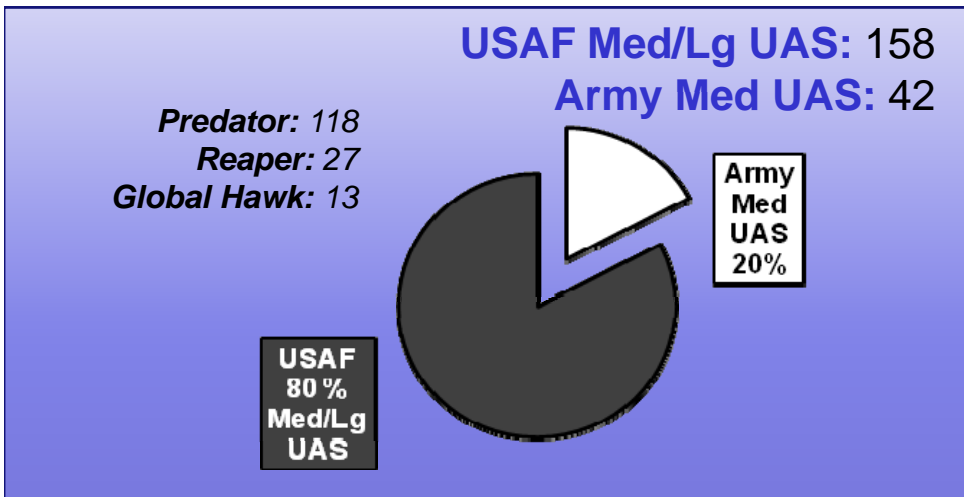
C2 / Employment



Weapons Used in Combat to Date



Composition of Inventory



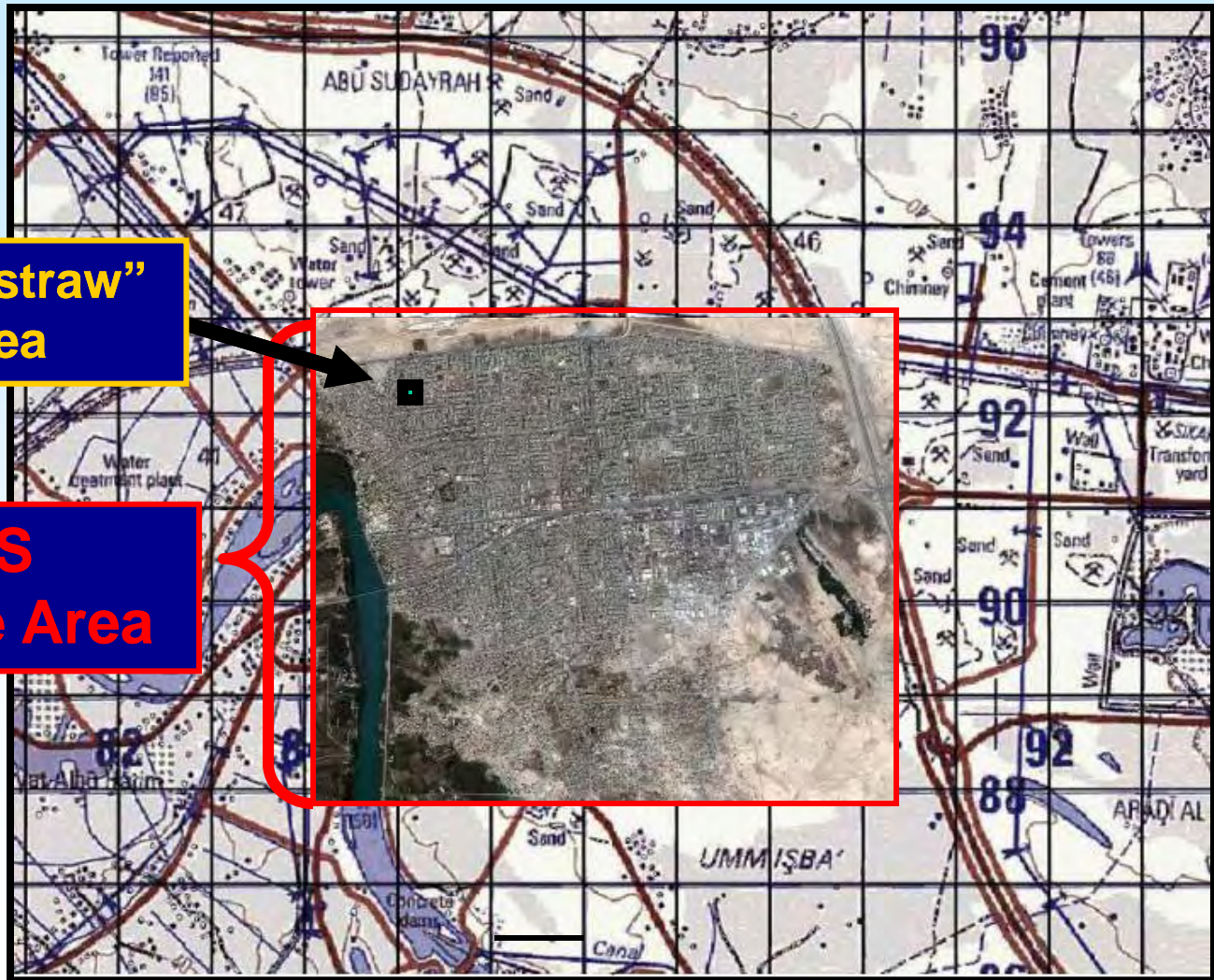


Wide Area vs. Standard Coverage

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**Predator "Soda straw"
coverage area**

**WAAS
Coverage Area**

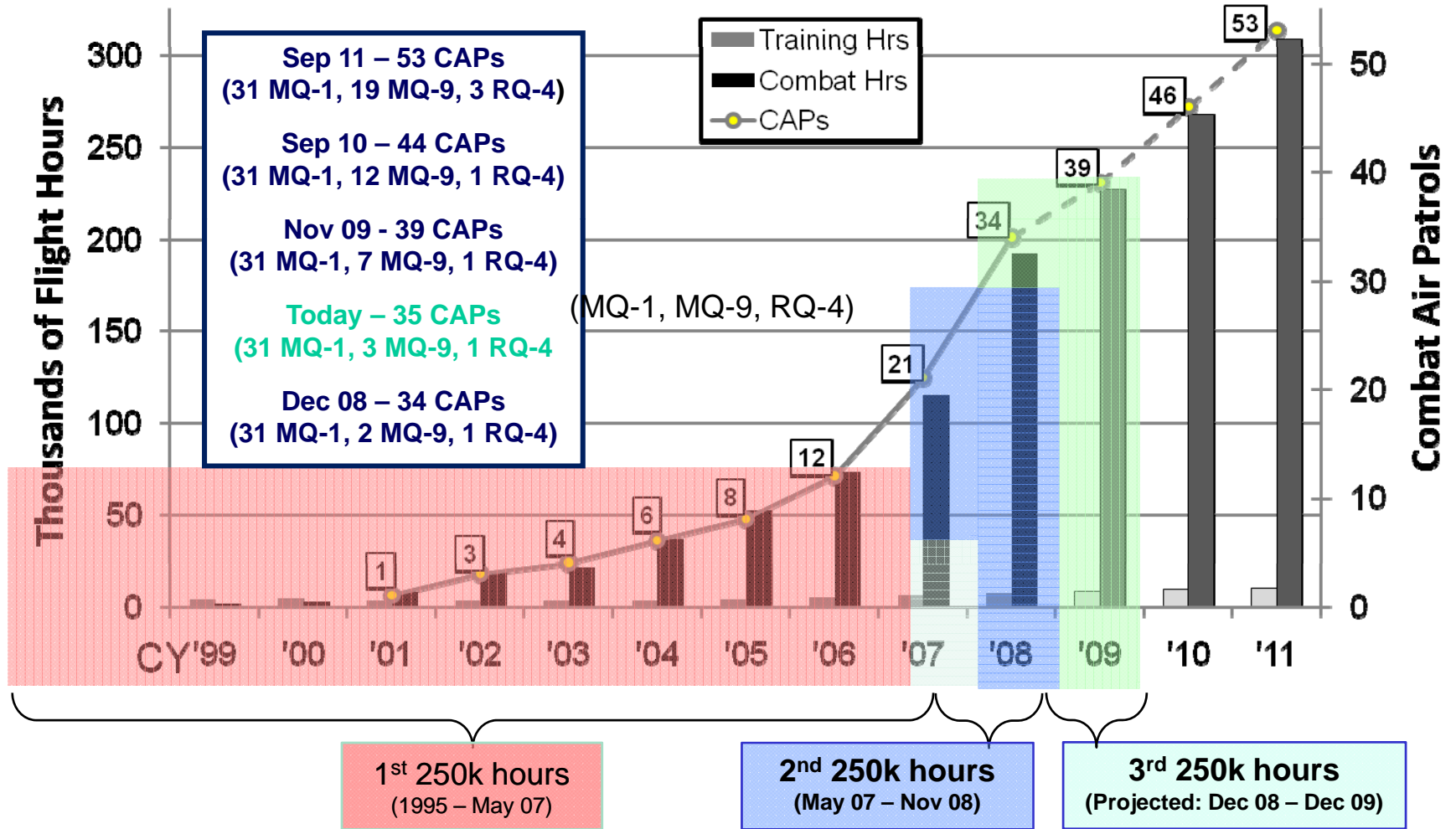


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USAF UAS Vision: Continued UAS CAP Growth



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Air, Space & Cyber Power are American Asymmetric Advantages



“Tanks And Armor Are Not a Big Deal...The Planes Are The Killers, I Can Handle Everything But The Jet Fighters”

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