Special Operations Forces Industry Conference

SOF Future Vertical Lift

COL Doug Rombough

PEO Rotary Wing

May 2011

Rotary Wing

Agenda

- Mission
- SOF Acquisition Team
- SOF Rotary Wing Programs
- Transformation of SOF VL
- Contact Info
- Way Ahead

Mission

Provide program oversight for Rotary Wing Systems in USSOCOM. Support all stakeholders in Rotary Wing Acquisition process to provide cutting edge capabilities to the SOF Community

SOF Acquisition Team

- Equip the soldiers of the 160th SOAR(A) with the most capable rotary wing aircraft in the world.
- Equip the airmen of the 6th SOS with NSWRA.

ARSOAC / AFSOC
(Capability Manager)

PEO RW (USSOCOM)
(Program Oversight)

160th SOAR (A) - SIMO / 6th SOS
(Users)

PM TAPO / PM NSRWA / PM STS
(Materiel Developer)

ROTARY WING

Current SOF RW Capabilities

UNCLASSIFIED

* Configuration Dependant

A/MH-6M MELB
Mission Equipped Little Bird (MELB)
Light Attack/Assault
* 6 Combat Equipped Troops (Assault)
* Cruise Speed: 90 knots
* Max Gross Weight: 4,700 lbs
Rapidly Deployable
Shipboard Operations
Surgical Point Insertion
Aerial Reconnaissance
Close Air Support
Reconfigurable Armament (Attack)

Mi-8/17
Medium Assault
* 32 Combat Equipped Troops
* Cruise Speed: 130 knots
* Max Gross Weight: 28,600 lbs
* Ext Loads: 10K lbs
Troop Movement
Resupply

MH-60M Blackhawk
Medium Assault
* 9 Combat Equipped Troops
* Cruise Speed: 140 knots
* Max Gross Weight: 24,500 lbs
* Ext Loads 9,000 lbs
Aerial Refuel Capable
Suppressive Fire Capability
Resupply
Advanced Aircraft Survivability Equipment
Defensive Armed Penetrator (DAP)
Reconfigurable Armament
Armed Escort & Close Air Support

MH-47G Chinook
Heavy Assault
* 44 Combat Equipped Troops
* Cruise Speed: 120 knots
* Max Gross Weight: 54,000 lbs
* Ext Loads:
25K lbs tandem & 26K lbs center hook
Aerial Refuel Capable
Suppressive Fire Capability
Resupply
Advanced Aircraft Survivability Equip

YMQ-18A Hummingbird
Unmanned Aerial System
Multi-role Missions (ISR/Re-Supply)
* Gross Weight : 5500 lbs
* Payload: 2500 lbs
* Range: 2250 NM
* Endurance: 18.7 hrs w/300 lbs
12.1 hrs w/532 lbs
8.1 hrs w/1000 lbs
* Speed: 142 kts
* Ceiling : 20000 ft

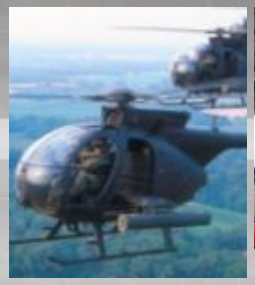
UNCLASSIFIED

Combat Mission Simulators

MH-47E CMS


"SimAuthor"
Flight Data Analysis & Visualization

A/MH-6M Little Bird




MH-47G CMS


Battle Staff Training System

"SOF TEAMS"

"CAAS" Desktop Trainers

MH-60K CMS


MH-60L/M CMS


Direct Support Maintenance

Aquatics Training Facility (Dunker)

SOF RW Transformation

~~MH-6C~~
~~AH-6J~~
~~MH-6J~~

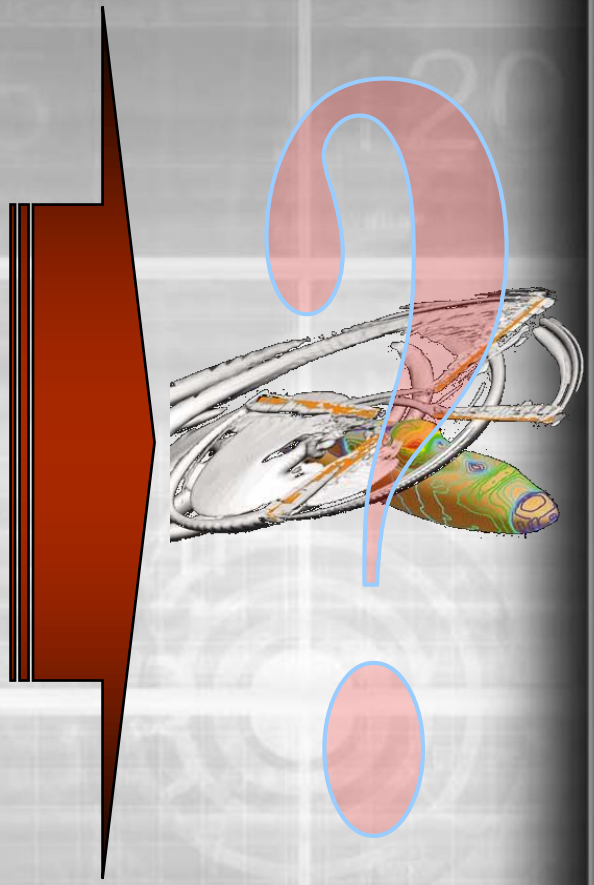
MH-6M (51)

MH-60L
MH-60L DAP
MH-60L C2
MH-60K

MH-60M (72)

~~MH-47D~~
~~MH-47E~~

MH-47G (69)



Rotary Wing Lift Transformation

Lighter & Faster

Increase Payloads

Increase Lethality

Increase Survivability

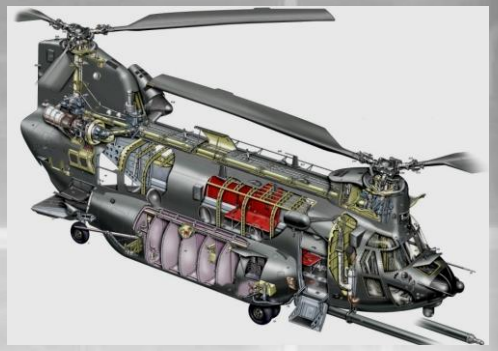
Increase Situational Awareness

Reduce Crewmember Workload

Seamless & Quick Aircraft Integration

ROTARY WING

Incremental Improvement MH-47



MH-47G

MH-47G New Build

MH-47D/E

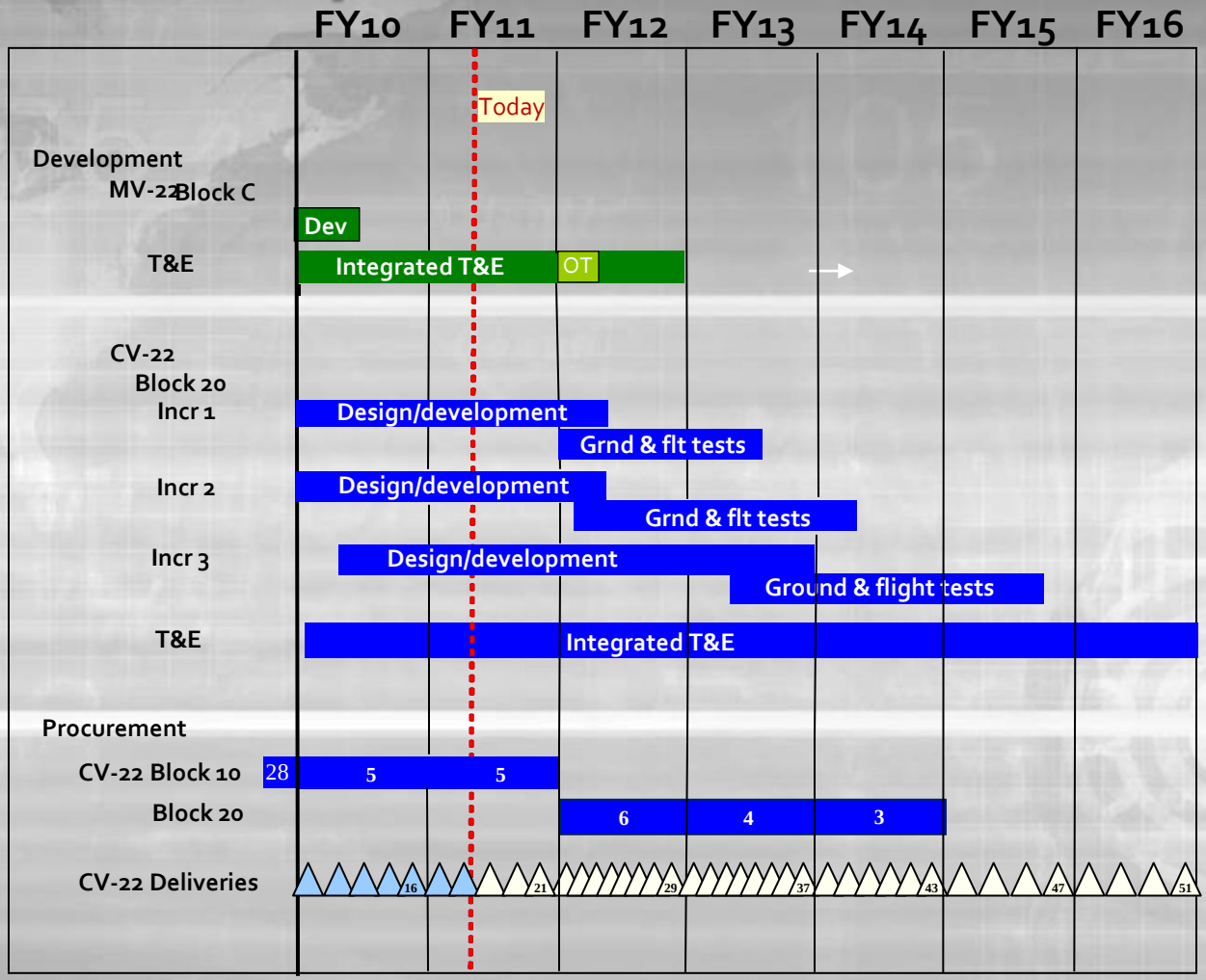
CH-47 A/B/C

BGAD 1 BGAD 1.1 BGAD 2.0 BGAD 2.1 BGAD 2.2 BGAD 2.3

1960's 1980's 2000 2010 2025

ROTARY WING

Incremental Improvement CV-22



ROTARY WING

Bottom Line

The current fleet of DOD rotorcraft cannot continue to be incrementally improved to meet future operational requirements. Significant increases in range, speed, payload, survivability, reliability, and reduced logistical footprint are all required and can only be met through the application of new technologies, which are best developed through a Joint Multi-role/commonality approach.

DOD Initiative (2009 FVL Begins)

- The genesis of this initiative was a letter from the Congressional Rotorcraft Caucus, signed by co-chairs Congressman Sestak and Congresswoman Granger, to the Secretary of Defense and Chairman of the Joint Chiefs of Staff requesting they conduct and provide the results of an Assessment of future DOD Vertical Lift aircraft capabilities. Secretary of Defense Gates directed the Office of the Secretary of Defense (OSD) Acquisition, Technology and Logistics (AT&L) to:

"Lead the development of an Assessment that will outline a Joint approach to the future development of vertical lift aircraft for all the Military Services."

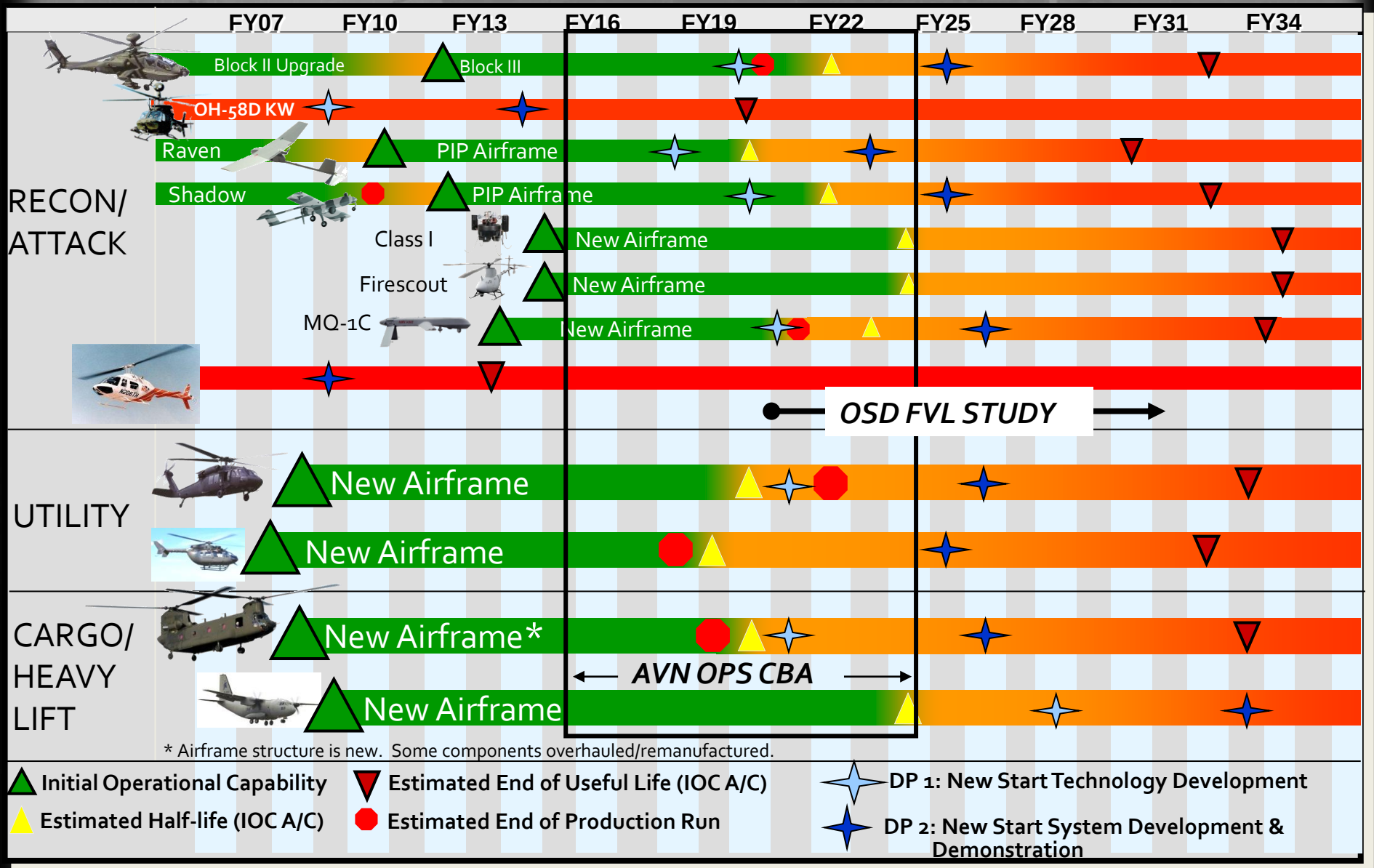
DOD Initiative (Cont)

- Subsequent to Secretary Gates' response, the 2009 Duncan Hunter National Defense Authorization Act was signed into law and included Section 255, which had similar language directing:

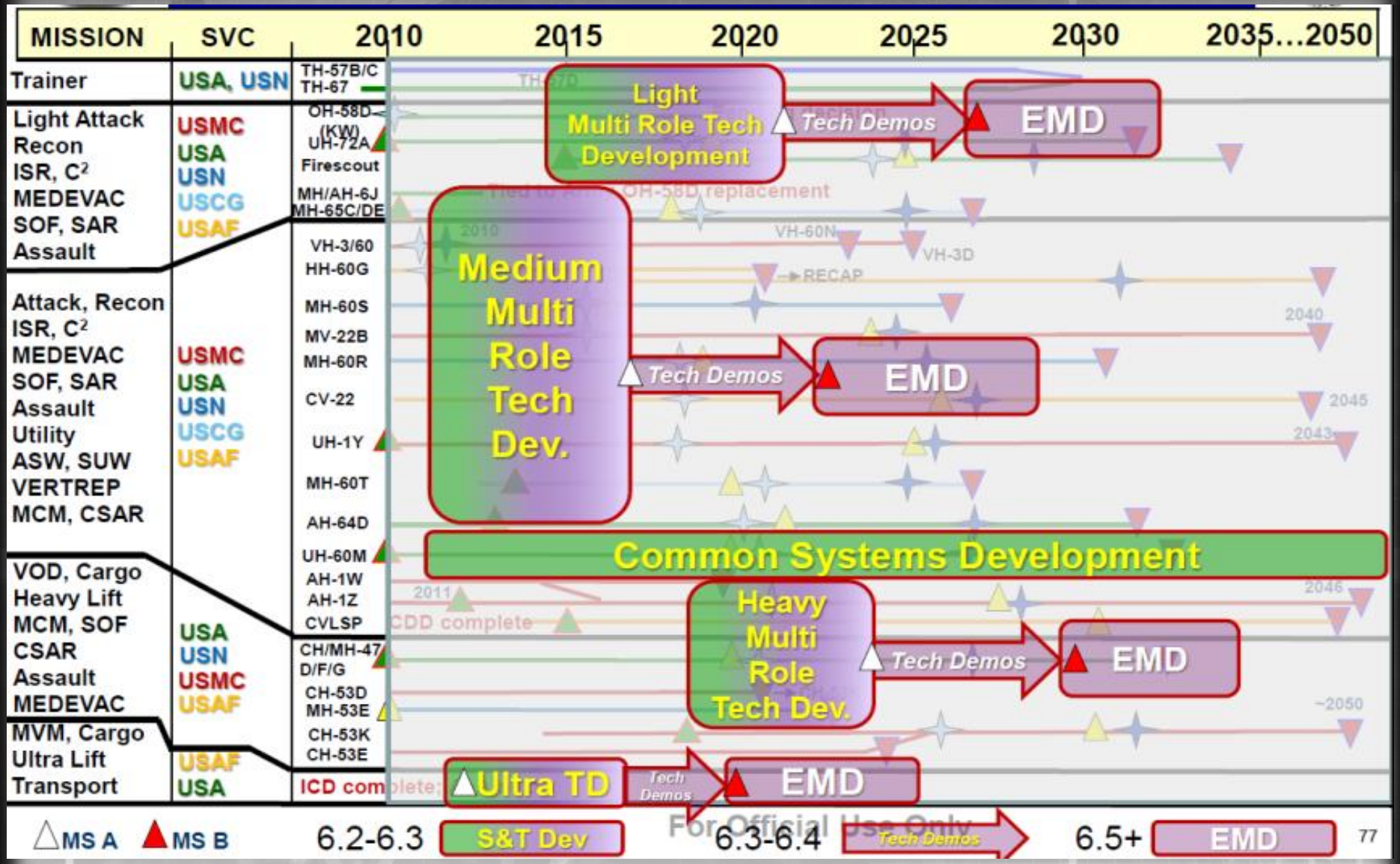
  "The Secretary of Defense and the Chairman of the Joint Chiefs of Staff shall carry out a capabilities-based assessment that outlines a joint approach to the future development of vertical lift aircraft and rotorcraft for all of the Armed Forces."

- The OSD (AT&L) Director, Land Warfare and Munitions (LW&M) and the Deputy Director, Resources and Acquisition, J-8, Joint Staff, co-chaired the Future Vertical Lift (FVL) Executive Steering Group (ESG) to provide guidance and oversight to the capabilities based assessment team.

Platform Assessment



Baseline Aircraft by Class



JMR Emerging Attributes

JMR Study Performance Ranges				
	Light	Medium	Heavy	Ultra
Speed	>170-300+ kts	>170-300+ kts	>170-300+ kts	300+ kts
Combat Radius	~424 km	~424 km	~424 km	~462 km
Payload (Int)	~2k - 4.5k lbs	~6k - 20k lbs	~20-30k lbs	~40-72k lbs
Payload (Ext)	~2k - 4.5k lbs	~10k - 20k lbs	~16-30k lbs	~40-72k lbs
Passengers*	~4-6	~11-24	~33-44	~100-120

*Combat troop weight 365lbs

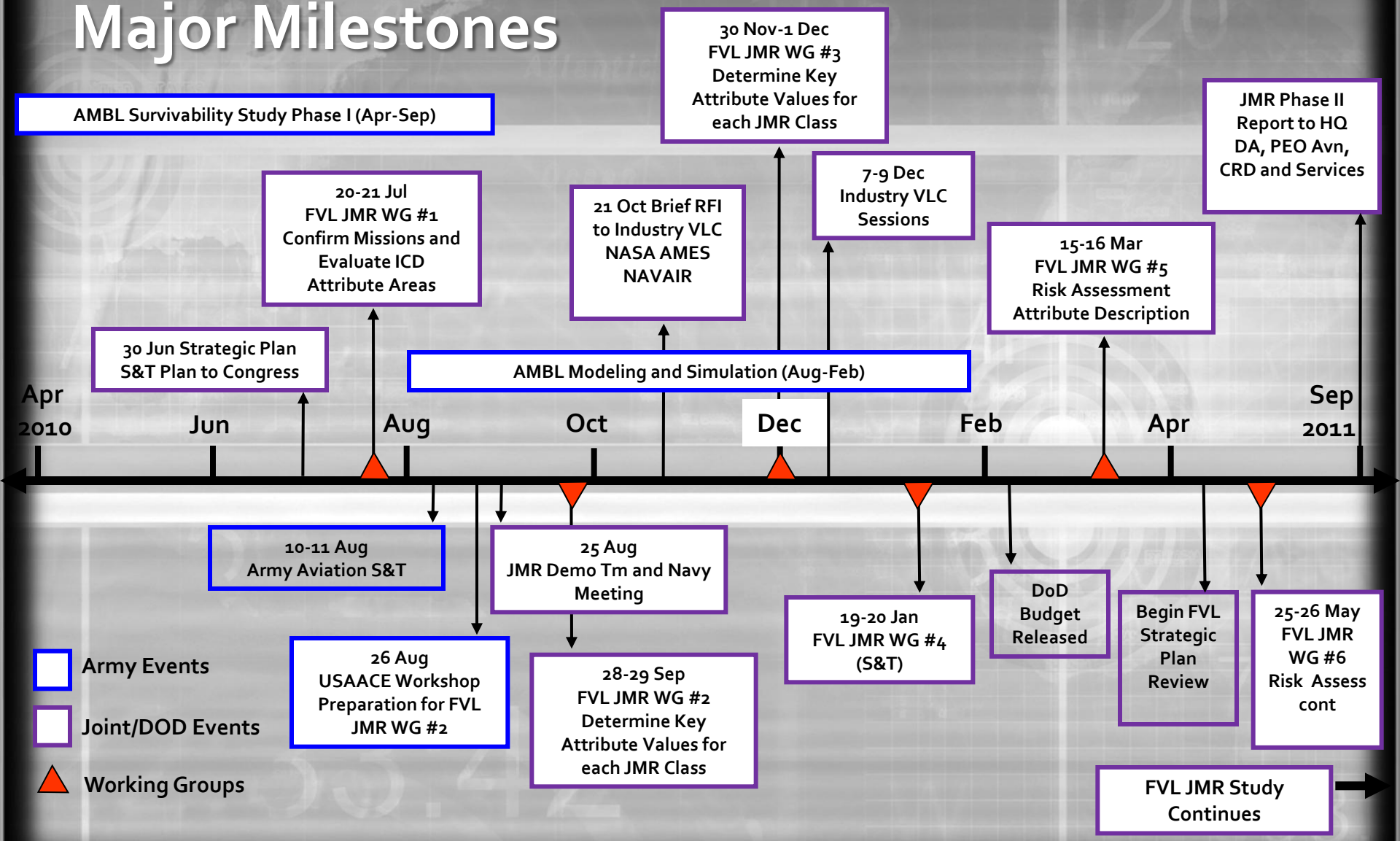
Identified range of Joint missions

Light	Medium	Heavy	Ultra
Recon	Recon	Recon	VOD
ISR	ISR	ISR	Cargo/Lift
MEDEVAC	MEDEVAC	SOF	Transport
SOF	SOF	Amphib Assault	MVM
SAR	SAR	CSAR	
Amphib Assault	Amphib Assault	VERTREP	
Attack	Attack	MCM	
ASW	CSAR	VOD	
ASUW	ASW	Cargo/Lift	
C2	ASUW	Transport	
Transport	VERTREP		
Security	MCM		
	C2		
	VOD		
	Cargo/Lift		
	Transport		
	Security		

*The **Ultra** category is being examined through the United States Air Force Aeronautical Systems Center (ASC) Capabilities Integration Directorate (ASC/XR) and is not included in this RFF.*

FVL JMR Study Timeline

Major Milestones



FVL Processes

	FY09	FY10	FY11	FY12	FY13	FY14	FY15	FY16	FY17	FY18	FY19	FY20
Strategic Plan	FVL CBA → FVL SP		POM-12 Build	FVL SP Update 1		FVL SP Update 2				FVL SP Update x		

Requirements Development

Army JMR Study — **Joint** FVL Study

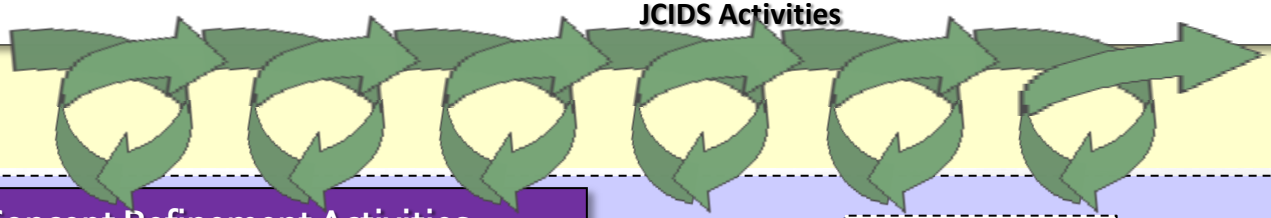
Ph I — **FVL JMR**

Multi-Role Concept Validated — Attribute Refinement

Analysis can support JCIDS and the JMR Demonstrator Program

***** No current intent to establish an ICD developmental plan beyond the framework depicted in the FVL Strategic Plan.***

JCIDS Activities



Concept Refinement & Technology Development

Concept Refinement Activities

Configuration Trades

S&T, User, & Industry

JMR Demo Program can support JCIDS

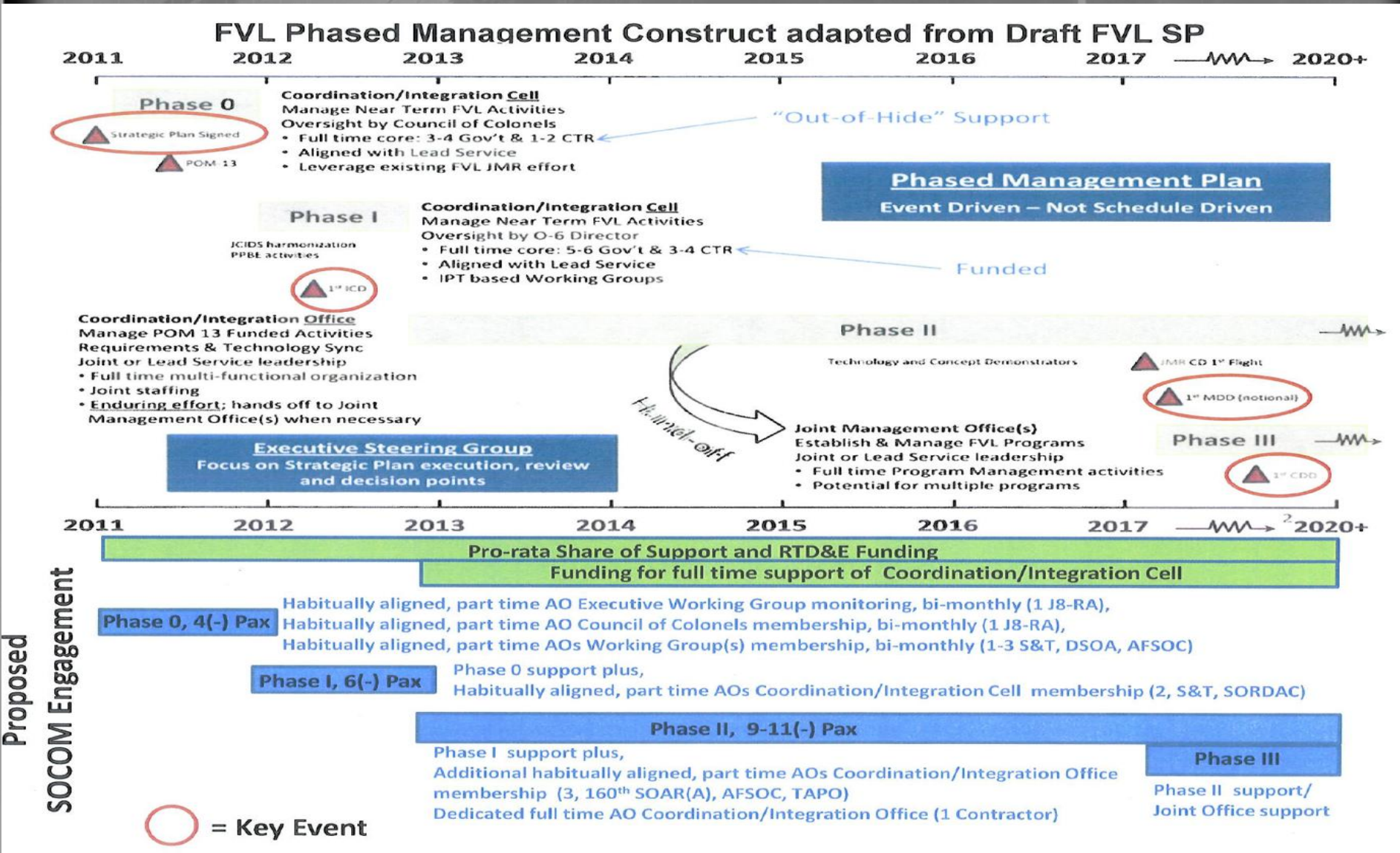
FVL S&T Plan

JMR Technology Demo

Design & Analysis Tool Dev/Refinement

S&T & User

SOCOM Involvement (Proposed)



X-49/X3/ X2 Demonstrators

Examples of today's VL technology

Low Vibration

Active Vibration Control

250 Kts Speed

Low Noise

Low Pilot Workload

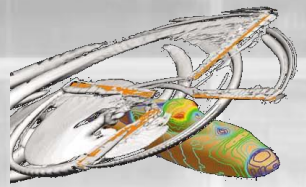
Exceeding Current Capability

Hover altitude	150% Increase
Mission Speed	100% Increase
Endurance	100% Increase
Payload	40% Increase
Acoustic Detection	50% Reduction
Size	15% Reduction
Turn Radius	50% Reduction

OH-58D

40% Coverage

???



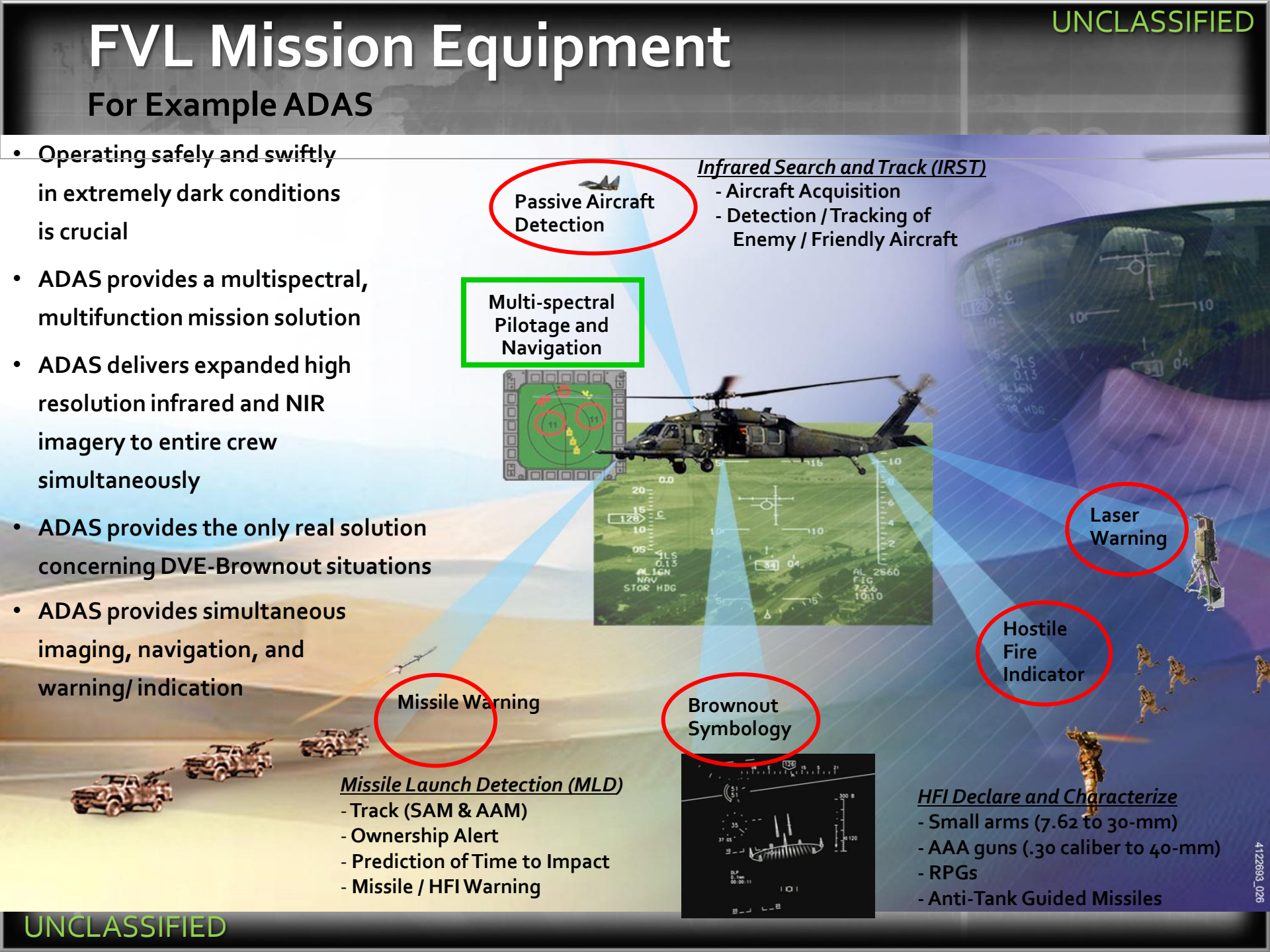
97% Coverage

ROTARY WING

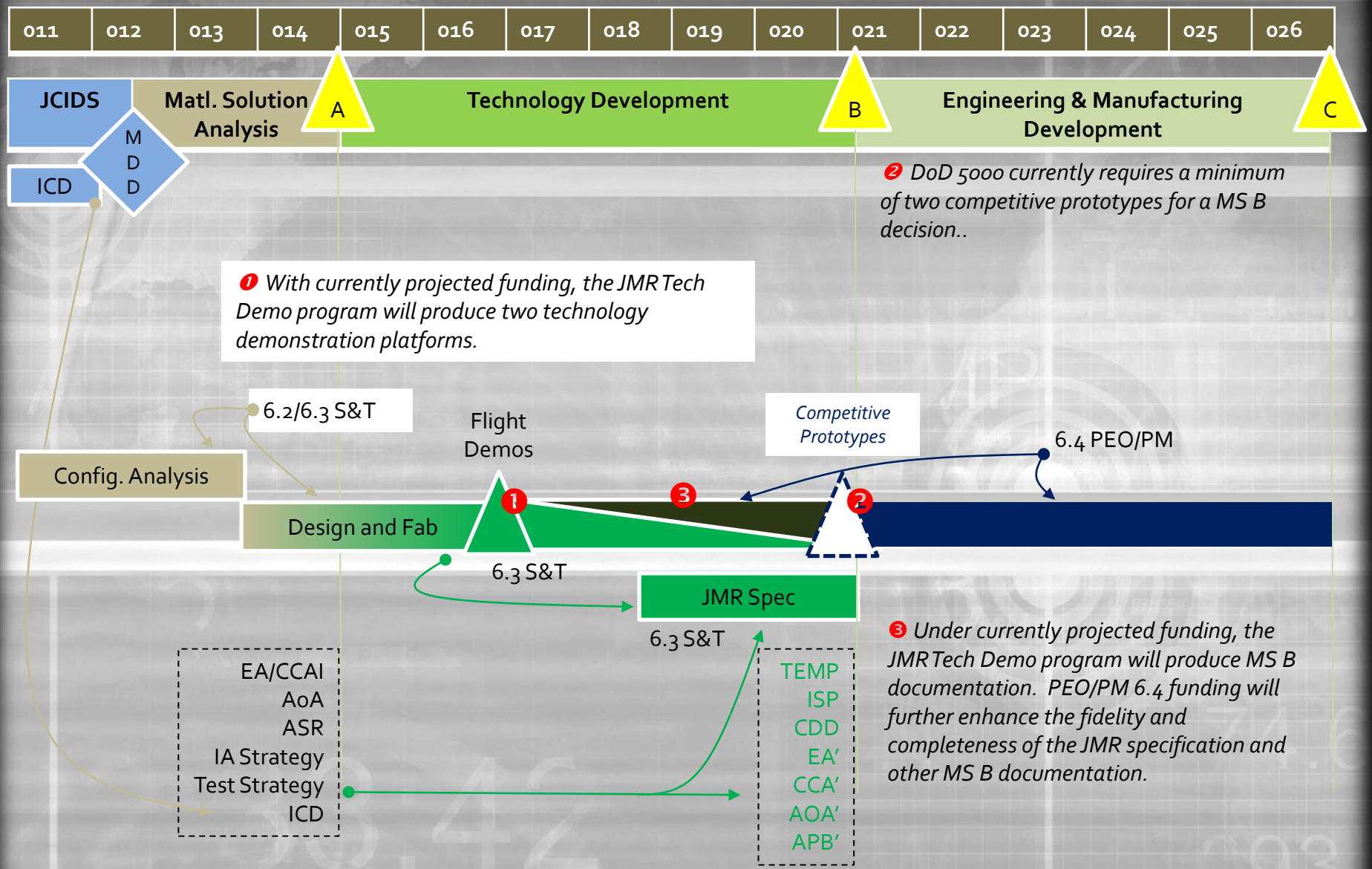
FVL Mission Equipment

For Example ADAS

- Operating safely and swiftly in extremely dark conditions is crucial
- ADAS provides a multispectral, multifunction mission solution
- ADAS delivers expanded high resolution infrared and NIR imagery to entire crew simultaneously
- ADAS provides the only real solution concerning DVE-Brownout situations
- ADAS provides simultaneous imaging, navigation, and warning/ indication



Typical Development Timeline



X-Plane Development Timeline

X-Plane vs "Normal" DoD Flight Program

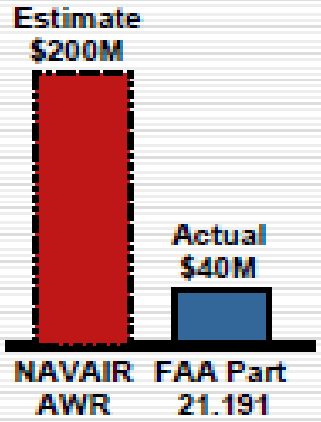
Allows Multiple Projects for Same Dollars

X-Plane Demo Program:

- Contractor with 30-50 personnel full time
- Government PM, DPM, and 5 Engineers full time
- Schedule 3-5 years, depending on scale and complexity of demo
- Cost $30M to $200M

"Normal" DoD Flight Development Program:

- Contractor 120 -200 personnel
- Government 48 – 80 FTE
- Schedule 6-8 years, depending on Phased breakdown
- Cost $300M to $1.5B

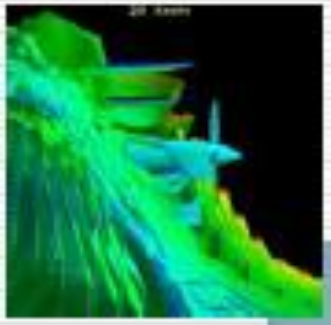


NAVAIR Decision to Transition to FAA Process Avoided 80% of Estimated X-49 Demo Cost

Contractor X Plane Methods Support Faster, Multiple Demonstrations

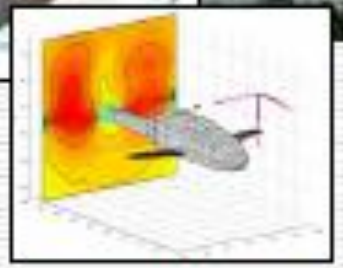
X Planes

X-Plane Development Validates Models



Today's tools can not predict multi-disciplinary optimization: aerodynamics, dynamics, loads, vibes, handling qualities

Iterative process of envelope expansion and tool development / calibration needed



Flight Test Data Critical for Validating High Fidelity Models

Building X Planes Refines Tools and Validates Them

Future Rotary Wing Concepts

Where We Want to Be

- OPV – Optional Piloted Vehicles with BLOS data links
- Perfect Compound Helicopter/Higher Speeds
- More Composites / Lighter Weight/Stiffer Construction/Higher Resonant Frequencies
- Low Observable/Low Acoustic "silent mode"
  - Low Acoustic Signature Gears and Transmissions
  - Active Acoustic Suppression "Bose Headphones"
- ADAS

Future Rotary Wing Concepts (Cont)

- Small Arms/RPG Shields
- Manned/Unmanned Teaming: Control UAV Helos From Manned Helo Teammate
- Dynamically Shapeable Rotor Blades- Change for Different Fight Conditions
- Color Changing Paint

Way Ahead

Planning for the next five years:

- MH-60M Modernization
- MH-47G Plus 8 New Build
- MH-47G 2.3 Block Upgrade
- A/MH-6M 3.0 Block Upgrade
- Hostile Fire Indicating System (HFIS)
- Aircraft Occupant Ballistic Protection System (AOBPS)
- Reduce Optical Signature Emission Solution (ROSES)
- Secure Real-Time Video (SRTV)
- Degraded Visual Environment (DVE) - brown out/white out conditions
- Lightweight Fire and Forget Weapon
- Upgrade Legacy Simulators

Questions