



United States Air Force Fuze Science & Technology

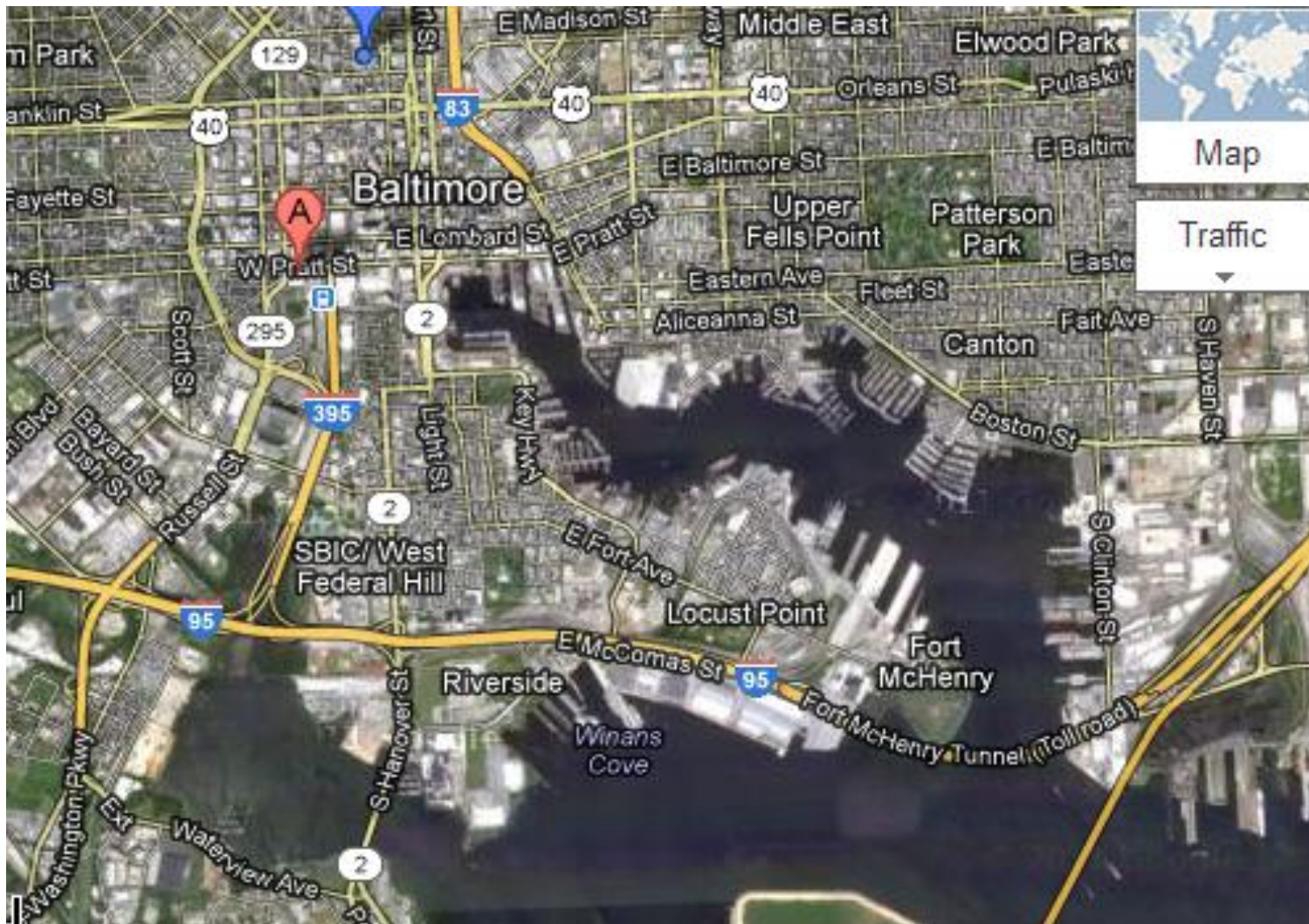
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Integrity ★ Service ★ Excellence



Baltimore on Google Map 2012





Fort McHenry







The Defense of Fort McHenry



FRANCIS SCOTT KEY

The Defense of Fort McHenry

*Oh, say can you see by the dawn's early light
What so proudly we hail'd at the twilight's last gleaming?
Whose broad stripes and bright stars thru the perilous fight,
O'er the ramparts we watch'd were so gallantly streaming?
And the rocket's red glare, the bombs bursting in air,
Gave proof through the night that our flag was still there.
Oh, say does that star-spangled banner yet wave
O'er the land of the free and the home of the brave?*



United States National Anthem Star Spangled Banner



Francis Scott Key





United States National Anthem Star Spangled Banner



**“And the rockets' red glare,
the bombs bursting in air,
Gave proof through the night
that our flag was still there”**



AFRL Munitions Directorate (RW)

An aerial photograph of a military base, likely a research and development facility, with several fighter jets flying overhead. The jets are in various positions, some banking and others flying straight. The base below features a mix of green fields, roads, and buildings. The sky is blue with scattered white clouds.

Vision:

Global leader in advancing weapons science and technology

Mission:

Lead the discovery, development, integration, and transition of affordable weapons technology, enabling the warfighter to win across all domains



A Requirement to Innovate

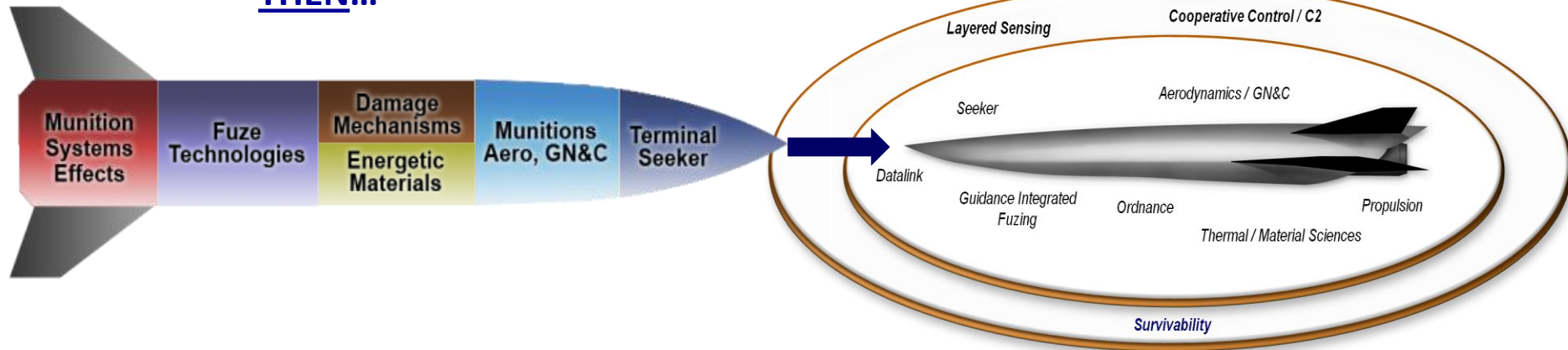


- Emerging Anti-Access Area Denial(A2AD) strategies & systems represent a disruptive innovation
 - “A2/AD environment that increasingly challenges U.S. military access to and freedom of action within potentially contested areas. <http://www.marines.mil/unit/hqmc/Pages/TheAir-SeaBattleconceptsummary.aspx>

NOW ...

Example: Conceptual 250lb Class Internal Carriage –
... a much more dynamic, sophisticated capability

THEN...



All AFRL Technology Directorates INVOLVED
M&S and Systems Engineering Underpins the Enterprise





AFRL Weapons S&T Enterprise Approach – “OneAFRL” Initiative



- **Integrated Strategic Planning and S&T Formulation**
- **AFRL Multiple Tech Directorate Investment via Strategic Weapons S&T Approach**
- **Integrated with AFRL XP(Plans) led Customer Engagement**
- **Cooperative Projects with DoD services, DTRA & DARPA**
- **Yields Deliberate Deliverables via AFRL Capability Concepts for Operational Capability Areas**



Weapons S&T Enterprise

Integration Spectrum





Integrate across the Enterprise to enable 5th/6th Gen Weapons

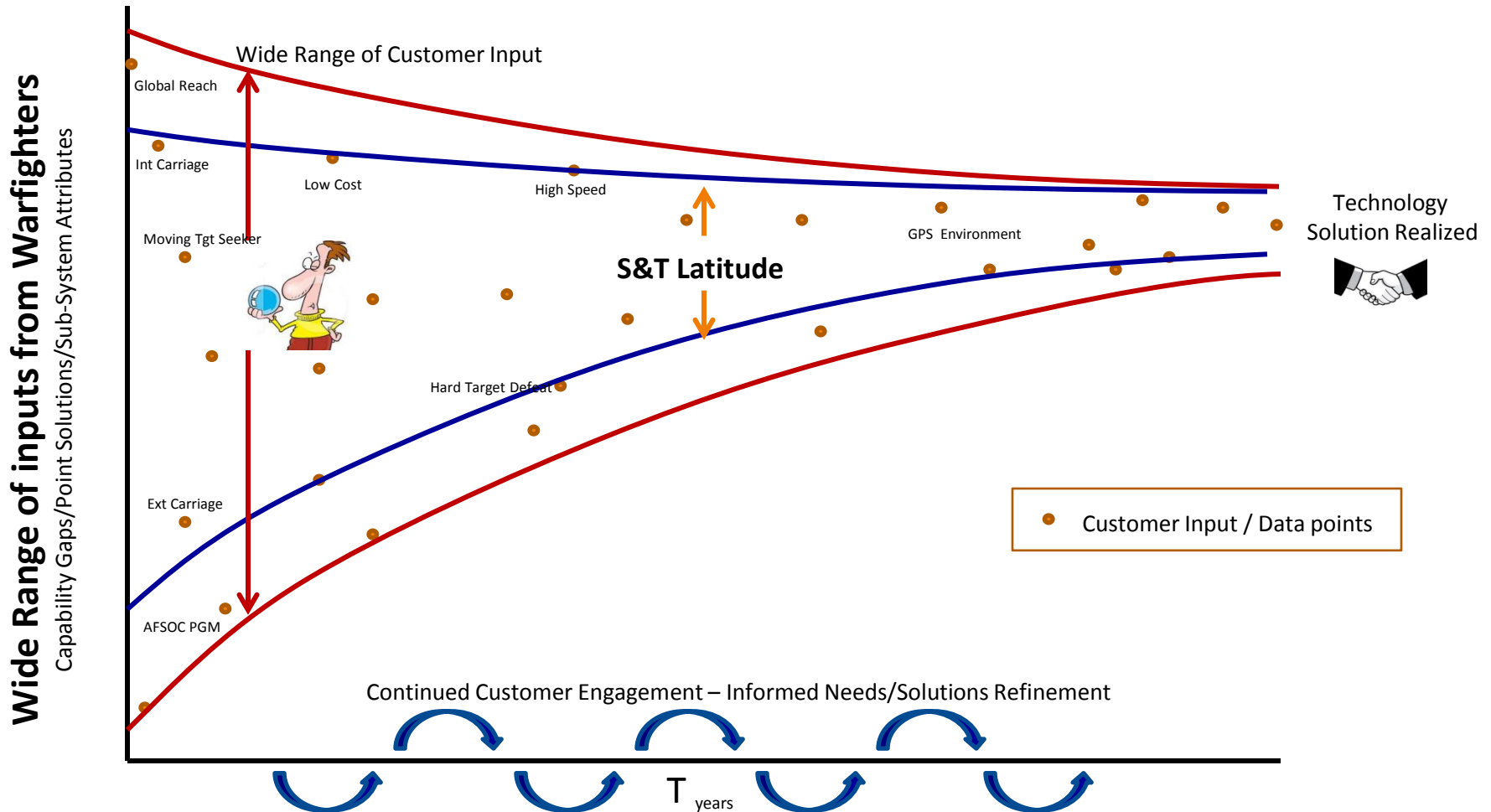


- **Propulsion (RQ)**
 - High-speed / Hyper-Sonic
 - Solids
 - Low Speed / Propeller
- **Aeronautics (RQ)**
 - Morphing Structures/Control Surfaces
 - Aero Propulsion Integration
 - Ultra-High Agility Airframes
- **C2 / Cooperative Control / Target Updates (RI)**
 - Secure Datalinks
 - Network Integrity / Trust / Autonomy
 - Cooperative Ctrl / Engagement Algorithms
 - Remote Sensing
- **Sensors (RY)**
 - Target Characterization and Phenomenology
 - Radome / Aperture Materials
 - Integrated Multi-function devices
- **Materials / Structures (RX)**
 - High Temp resiliency
 - Thermal protection / Coatings
 - Energy Storage / Mgmt Devices MEMS
- **Weapon Survivability (RQ,RX,RI)**
 - Active / Passive techniques
 - A/C → Weapon → Sub-munition Optimization
 - Countermeasures

AFRL & Industry S&T Vectors to meet requirements of Weapons Capability Concepts



Putting the “Desirements” vs. S&T Pursuits in Perspective



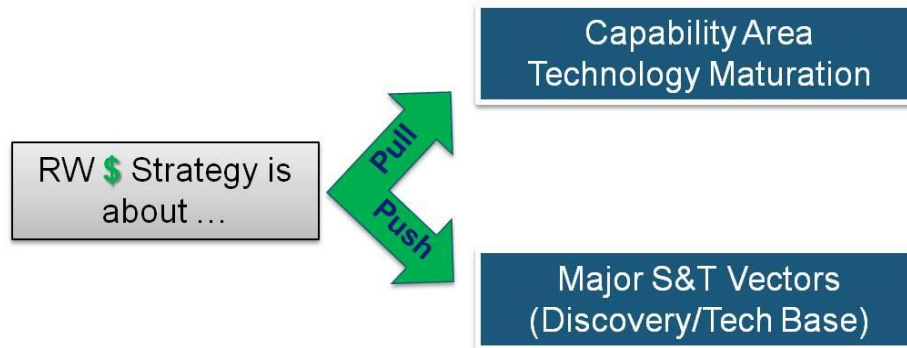
There are no exact Customer “Needs”
We need to make informed decisions & Guide our customers to optimal solutions.



Strategic Way Ahead



- **Investment Guide & Spring Review**
 - Designed to organize ALL S&T activities into manageable categories derived from Service Core Functions and AF Direction



- **Capability Pull** - Concept-driven technology development and demonstration will be organized around “Capability Areas”
- **Technology Push** - Discovery/Tech Base-driven research (will be organized around “Major S&T Vectors”)

Our challenge is to utilize all resources to solve both near and far-term capabilities challenges



Major S&T Goals

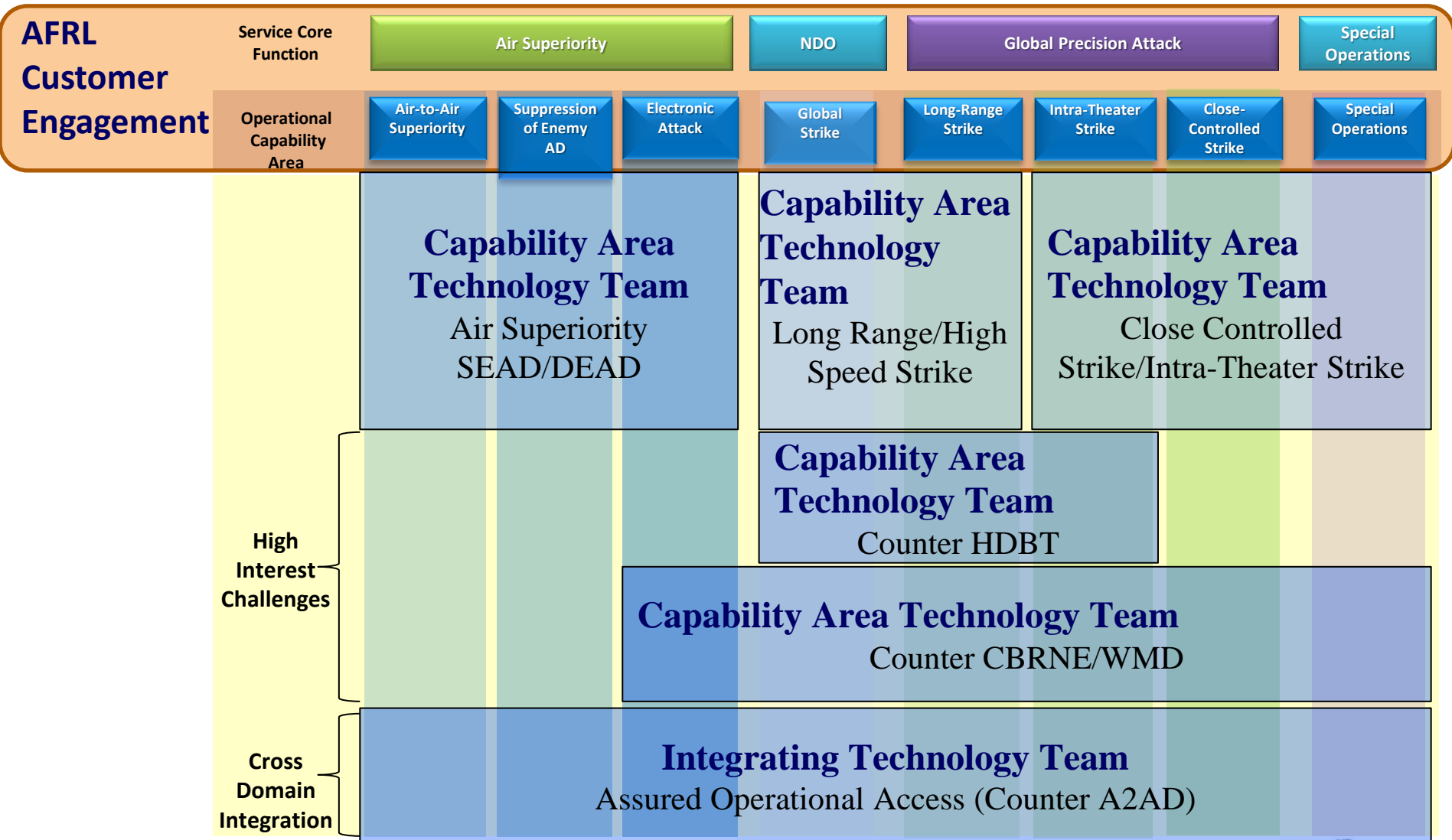
Customer Focused Vectors



- **Enable Joint Force Operation in Anti-Access Area Denial(A2AD) Environment / Counter Air (Highly Contested Airspace) (Air Sea Battle)**
- **Realize / Weaponize potential of 5th & 6th Gen Fighter & Bomber Platforms**
- **Hold Spectrum of High Value Targets at Risk**
- **Precise Effects in Combat Operations (MCO & Irregular)**
- **Integrated Cross Domain Operations (Air/Sea/Gnd/Space/Cyber)**
- **Other Game Changing / Leap Ahead Technologies**

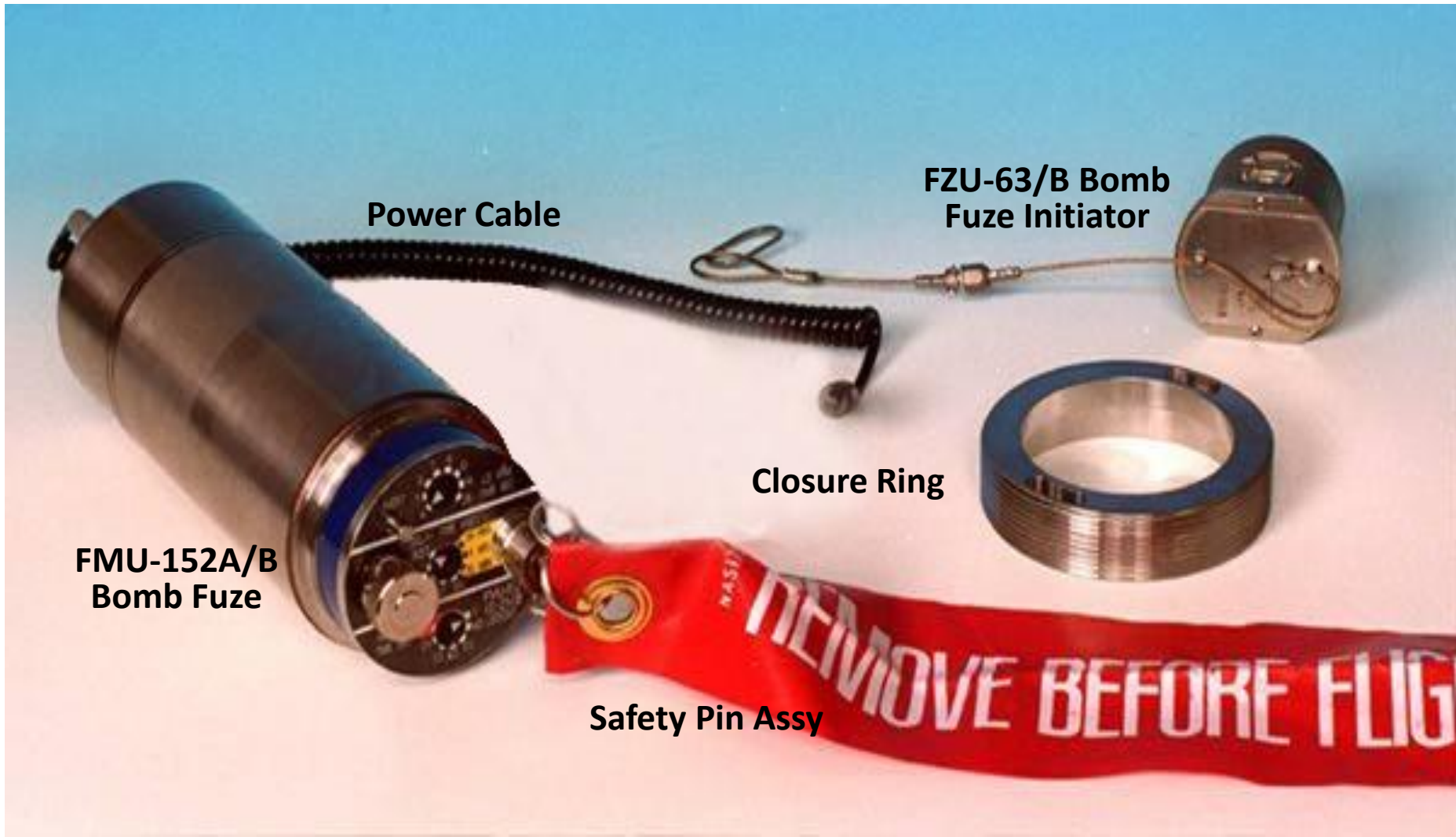


Conceptualize the Next Generation of Weapons





Joint Programmable Fuze FMU-152A/B



Power Cable

FZU-63/B Bomb Fuze Initiator

Closure Ring

FMU-152A/B Bomb Fuze

Safety Pin Assy

REMOVE BEFORE FLIGHT



JPF Schedule/Milestones



EVENTS	FY11	FY12	FY13	FY14	FY15	FY16
FMU-152A/B (JPF)						
<u>Production Contract</u>						
Lot 6 Deliveries	16,126					
Lot 7 Deliveries		12,048				
Lot 8 Deliveries	CA			19,648		
<u>Follow-on Contract</u>						
Lot 9 (includes FY12&13 funding)			CA	10,660		



HARD TARGET VOID SENSING FUZE FMU-167/B



The Hard Target Void Sensing Fuze (HTVSF):

Cockpit Programmable
Void Sensing Function

Multiple Arming Delay Times
Multiple Function Delay Times

3:20 Wednesday Closed Session
Hard Target Void Sensing Fuze (HTVSF) Update
ATK Elkton Operations



Air Force Fuze Summary



- **Munitions Directorate will lead a ‘new’ AFRL Weapons S&T Enterprise Approach**
- **Organizing S&T activities into manageable categories derived from Service Core Functions and AF Direction**
 - **Capability Pull - Concept-driven technology development and demonstration will be organized around “Capability Areas”**
 - **Technology Push - Discovery/Tech Base-driven research will be organized around “Major S&T Vectors”**
- **AF Fuze acquisition on track to deliver capabilities to warfighter**



Questions?

