STUAS/Tier II VTUAV Systems

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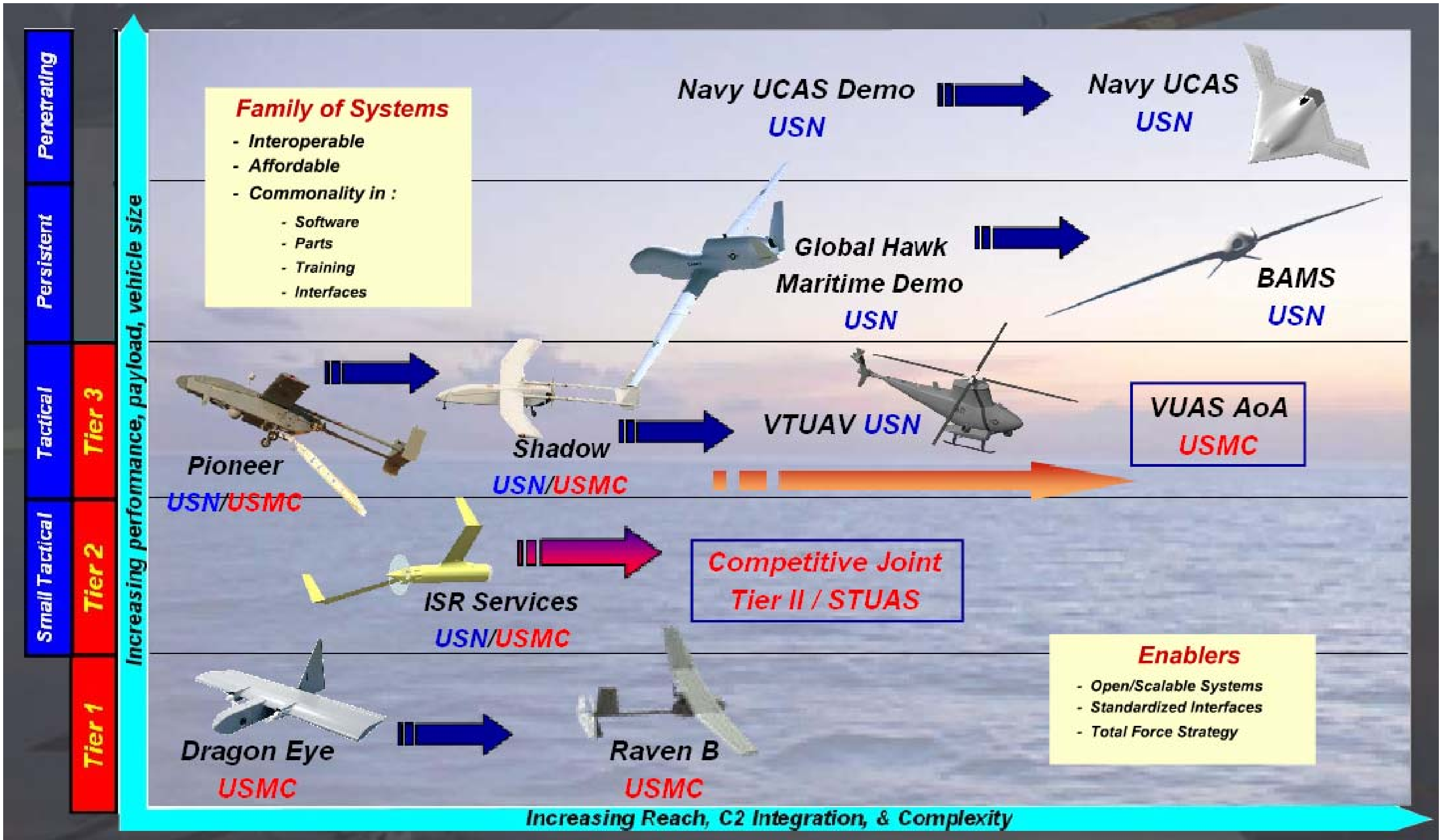
Agenda

- **Family of Systems Overview**
- **STUAS/Tier II**
  - System Description
  - Requirements Overview
  - Acquisition Strategy
- **VTUAV**
  - System Overview
  - System Description
  - Air Vehicle Performance
  - Payload Spiral Integration
  - Initial Weapon Selection Criteria

Naval UAS Family of Systems



System Description

- Small, organic, high duration UAS that operates runway independent for ground and maritime ISR missions. (10 hours+)
- 1 system = 1 ground control station, 3 airframes, 3 payloads and ground support equipment.
- Current payload set = EO/IR, comm relay, selected INT payloads.
- Ground control station integrated with Navy and USMC C2 systems in later spirals.
- Remote terminal included for “disadvantaged user”. Interoperable w/ ROVER III/OSRVT and others in later spirals.

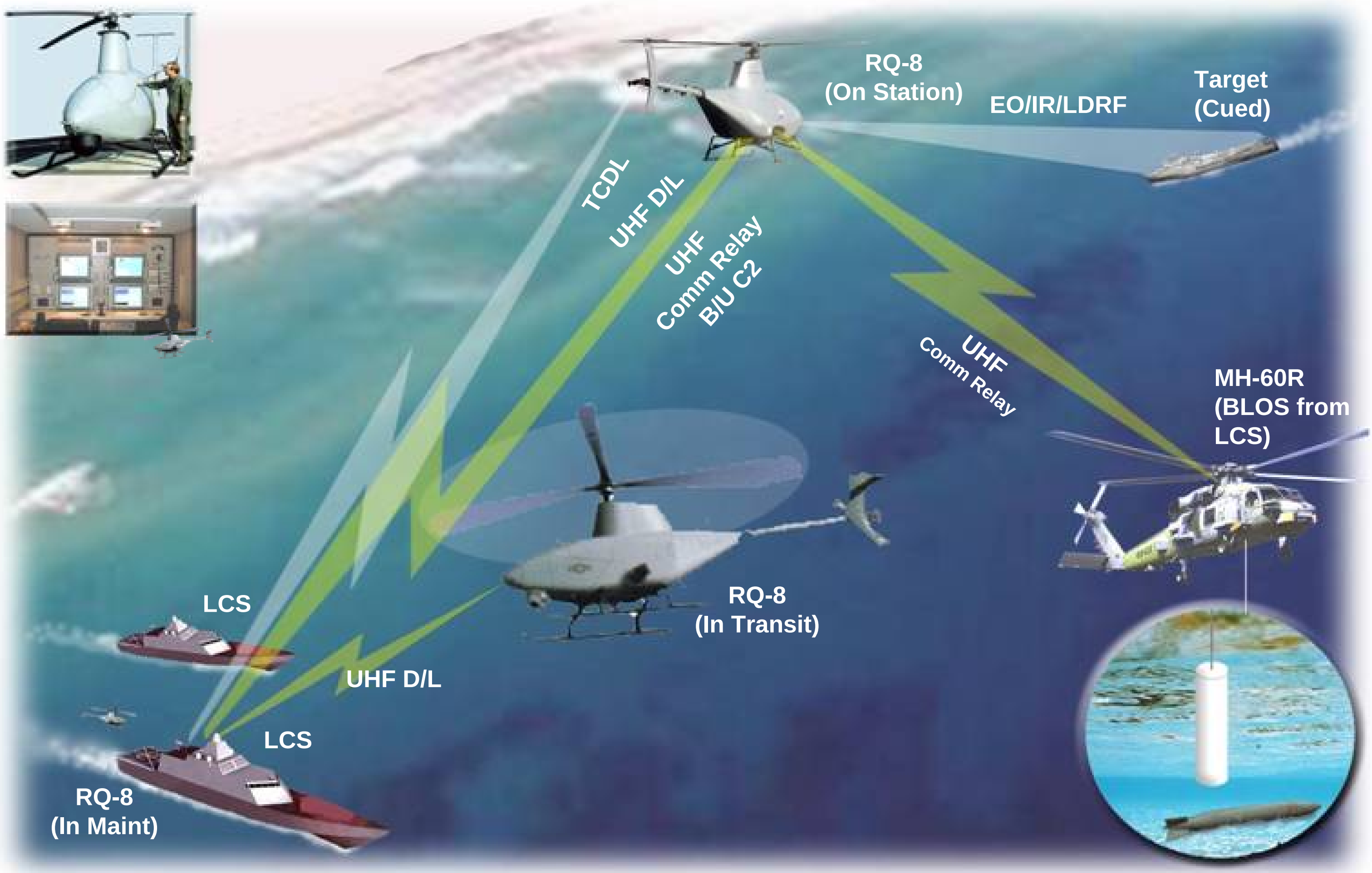
Requirements Overview

- **Proposed IOC FY 10**
- **ICD Approved Jan 2007; includes SOCOM, USAF, USMC, and USN Requirements**
- **AoA underway; estimated completion Aug 2007. USMC will maintain lead, PEO(W) & NAVAIR 4.10 will participate.**
- **CDD will establish capability requirements, including any needed incremental/spiral approach.**
  - Potential need for min development, OTS/NDI acquisition strategy to meet initial IOC requirement.
  - CDD planned completion Nov/Dec 2007.
- **Follow on system capabilities to be defined per spiral/incremental acquisition approach. Definition of follow-on spirals**
  - Increment 0 – off-the-shelf.
  - Increment 1 – C2 integration, comm relay, heavy fuel engine.
  - Increment 2 – payload enhancement.

Acquisition Approach

- **Combined single acquisition program for USN and USMC requirement**
- **N86: USN resource sponsor, Command Element: USMC resource sponsor**
- **ACAT III Program**
  - PEO(W) is the MDA.
- **PMA 263 – Program Lead**
  - MarCorSysCom personnel assisting with MAGTF C2 integration.
- **Full and Open competition for Baseline System for minimum development OTS/NDI system. Grow capability at planned increments after initial fielding.**
- **MS B targeted for FY 08**
- **IOC – FY 10**
  - Desire to phase out current USMC and USN ISR services contracts.

VTUAV System Overview



VTUAV System Description

Fully Autonomous Air Vehicle

- Fully Digital, Dual Redundant Control System
- Based on Schweizer 333 Commercial Helicopter

Brite Star II EO/IR Laser Designation/ Range Finder Payload

- Collect imagery
- Relative range and LOS to target for precision target coordinates
- Laser designate target on command

VTUAV System Description
Ancillary Equipment

Fully Encrypted, Digital Data Links


Tactical Common Data Link

- **Tactical Common Data Link (TCDL)**
  - Air Vehicle Command and Control
  - Imagery and data downlink
- **3 ARC-210 UHF/VHF Radios integrated on Air Vehicle provide control and Communications Relay Capability**

Designed for both Land and Sea Based Operations


UCARS-V2 for Ship Launch/Recovery

NATO-standard Pressure Refueling (JP-5, 8)


Harpoon and Grid Ship Deck Restraint

Interoperable Ground Control Station with Tactical Control System (TCS) software integrated

- **GCCS-M, JDISS, AFATDS, CCTV & JSIPS-N**
- **NATO STANAG 4586 Compliant**
- **Multi-Vehicle control**
- **Open Architecture**

MQ-8B Air Vehicle Performance

- **Service Ceiling – 20,000’**
- **Airspeed - >80 knots**
  - Currently 107 knots
- **Combat Radius – 110nm with 5 hour loiter**
- **All Weather Day/Night capable**
  - Certified lighting system
  - Ambient air temperatures ranging from –29C to +50C
  - Operate in precipitation measuring 1.5 inch per hour for one hour
  - Capable of detecting and transiting through light icing conditions
  - Protected from and resistant to degrading effects of sand, dust and salt laden air
- **Electromagnetic Environmental Effects Qualified**
  - MIL-STD-464A and Guidelines in MIL-HDBK-273C
  - Shipboard and land based environments

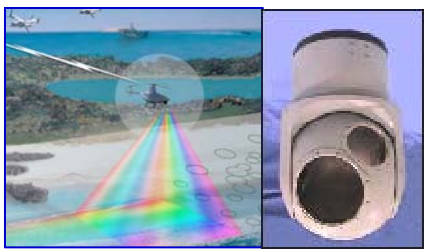
VTUAV Payload Spiral Integration

Current FY-07/08

BRITE Star II

EO/IR/LDRF

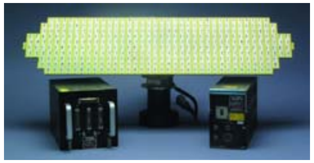
COBRA



Coastal Battlefield Reconnaissance and Analysis Block I, II & III

Block I

RADAR



Maritime Multi-Mode Radar

AIS

Ship Based IFF

Weapons

Precision Weapons

JTF WARNET

Data Relay

Future

CVLWT

Compact Very Light Weight Torpedo

Specialty Payloads

- •Chem/Bio/Nuclear Detect
- •Homeland Security
- •EW/SIGINT

Modular Payload Architecture

- • Swap Payloads between missions (Load & Go)
- •System recognizes payload and automatically loads software module
- • Easily accommodate new payloads via defined interface specifications and open architecture
- •Minor control changes to HW/SW on Air Vehicle and GCS for new payloads

Initial Weapons Selection Criteria

- **Weapon Weight < 250lbs**
  - Weight of weapon is a tradeoff with usable fuel which equates to range/time on station
  - Low cost/sufficiently lethal weapons typically lightweight
- **Precision Guidance or Projectiles**
- **Warhead applicable to Fast Attack Craft threat**
- **In Production or Final Stage Development**
- **Qualitative assessment between the types of weapons to select the "best" candidate for integration.**
  - Integration Complexity (launcher, software control, Operator/Mission Control)
  - Stable Flight Dynamics of Air Vehicle
  - Standoff Range/Off-axis Shot / Fire Scout Survivability
  - Shipboard Considerations (build-up, storage, certification)

Questions?