RDA CHSENG
MISSION ENGINEERING USE CASE
UNMANNED SYSTEMS

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ASN (RD&A) CHSENG INTEREST

- Development of Unmanned Systems (UxS) to support Navy warfighting needs is still in its infancy
  - Unified management of requirements and acquisition has not happened for the **UxS**
- Since 2006, ASN(RDA) CHSENG has provided implementation guidance for Systems Engineering within a "System of Systems" architectural perspective. ASN(RDA) CHSENG has stressed the importance of applying Systems Engineering processes to the mission area system of systems.

- Unmanned Systems provide an opportunity for the application of Mission Area Systems Engineering principles and processes to define their operational effectiveness in Navy acquisition.

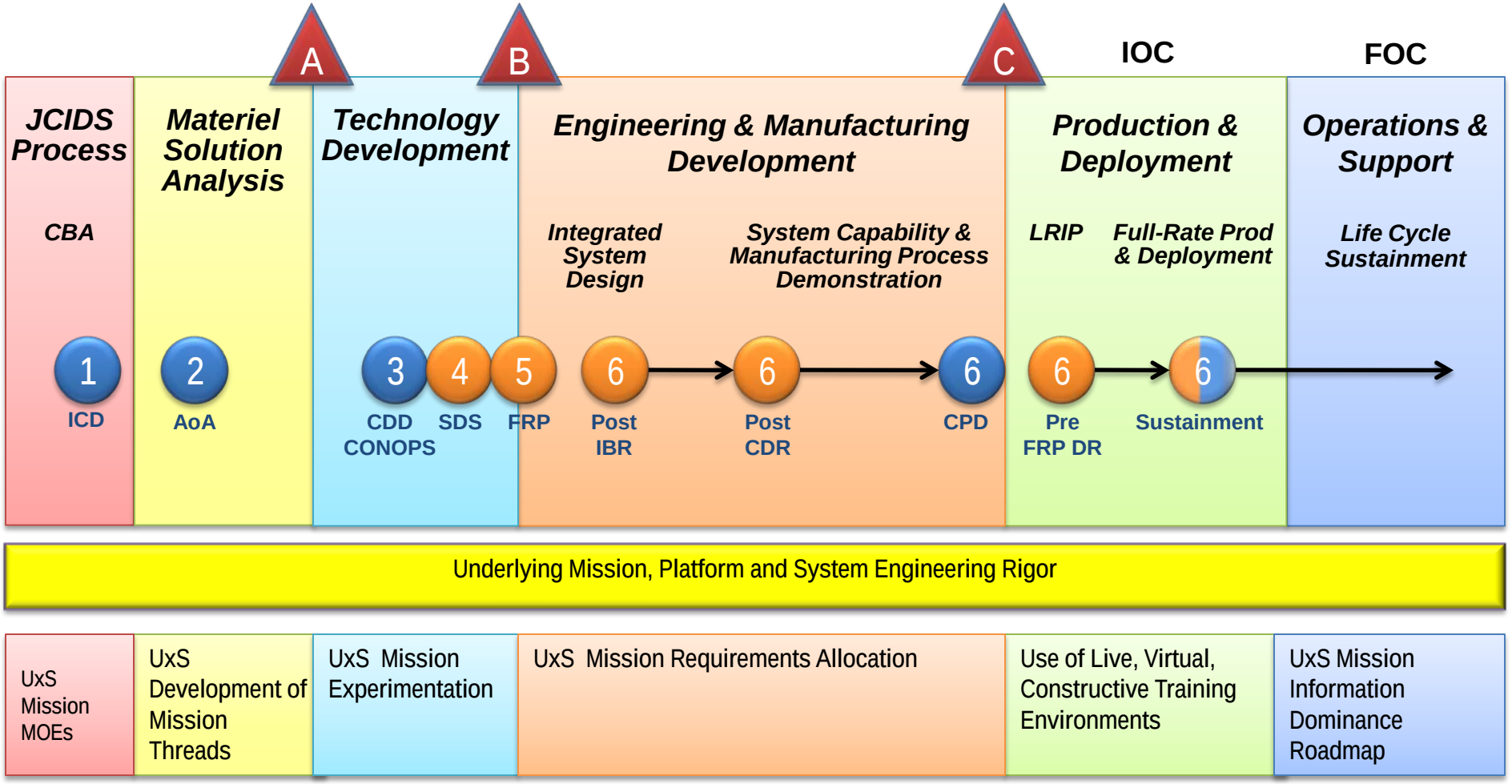
A DEMAND SIGNAL CREATES OPPORTUNITY

Demand Signal-

- **CNO Direction**
  - **Move Boldly:**
    - **Into Unmanned, machine autonomous technologies**
    - **Create a Fully-Integrated Intel, C2, Cyber & Networks Capability**
    - **Improve sea-based mid-range unmanned ISR capability**
    - **Sustain PR-11 increases in long-range persistent sea-based unmanned ISR and strike**
- **SECDEF Guidance for the Development of the Force**
  - **Ensure sea-based mid-range UAS in two locations in FY12, including sea-based ISR for the National Mission Force**
  - **NLT FY15, conduct CVN-based experiments with Navy-Unmanned Combat Air System**
  - **Assess the feasibility of accelerating Initial Operating Capability of CVN-based unmanned aircraft for strike and ISR missions**
- **Unmanned Vehicles are SECNAV's No. 2 Priority**

MISSION AREA ENGINEERING IN PROGRAM GOVERNANCE

RDA CHIEF SYSTEMS ENGINEER
ASN (RDA)



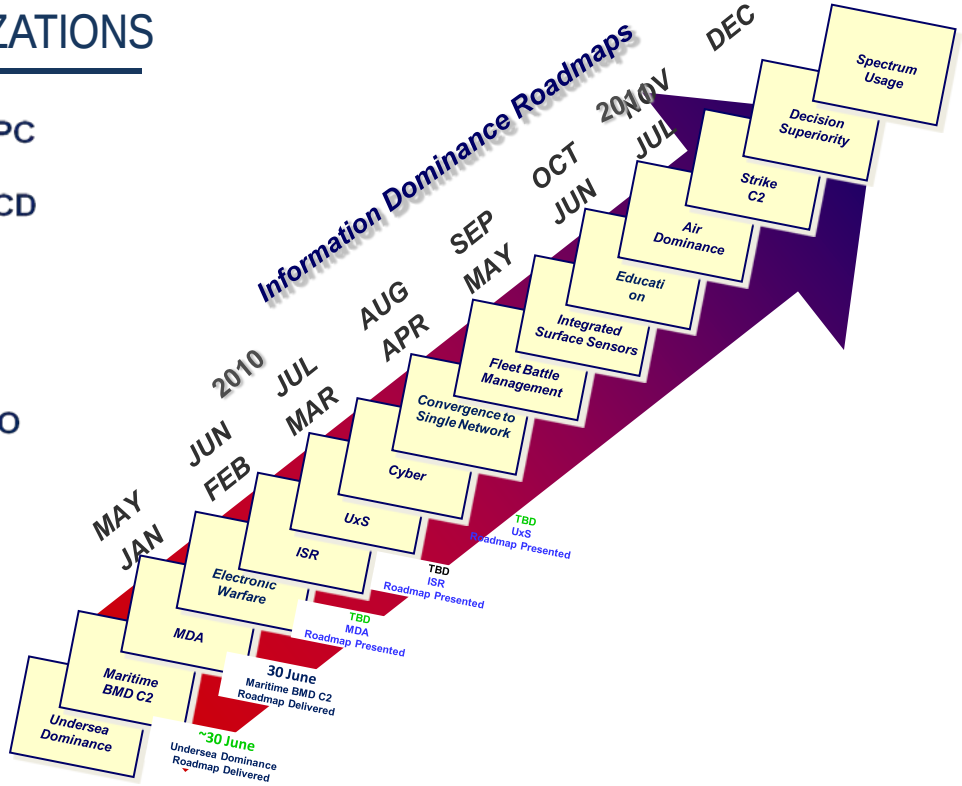
Alignment of Department's Engineering Efforts

CROSS FUNCTIONAL TEAM

- Unmanned Systems Cross Functional Team (CFT) established by OPNAV N2/N6 to support the development of the UxS Information Dominance Roadmap

PARTICIPATING TECHNICAL ORGANIZATIONS

- ASN RDA CHSENG
- NAVAIR 4.0
- SPAWAR 05
- NAVSEA 05
- MARCORSYSCOM
- NAWC WD
- NSWC DD
- NSWC DN
- NSWC PC
- NSWC CD
- NUWC
- ONR
- DON CIO
- NMSO



SYSTEM ENGINEERING CHALLENGES

- Current effort of CFT is an unfunded coalition of the "willing" – a Mission Engineering Consortium
  - RDA CHSENG is re-aligning existing tasking to begin work but will need to adapt and adjust resources to continue the work.
- Anticipated overhead budget cuts may jeopardize the coalition's strategic value:
  - Drives system and platform centric results as opposed to mission level perspective that can provide integrated alternative cost to capability options
  - Taxing programs to do this work creates unwanted bias
- Stakeholder organizations are hesitant to fully engage until Senior Leaders endorse way ahead and define resource priorities

Nevertheless, evolving mission capabilities to exploit UxS promises significant program savings at the Department level

PROPOSED CFT SCOPE WITH IPTS

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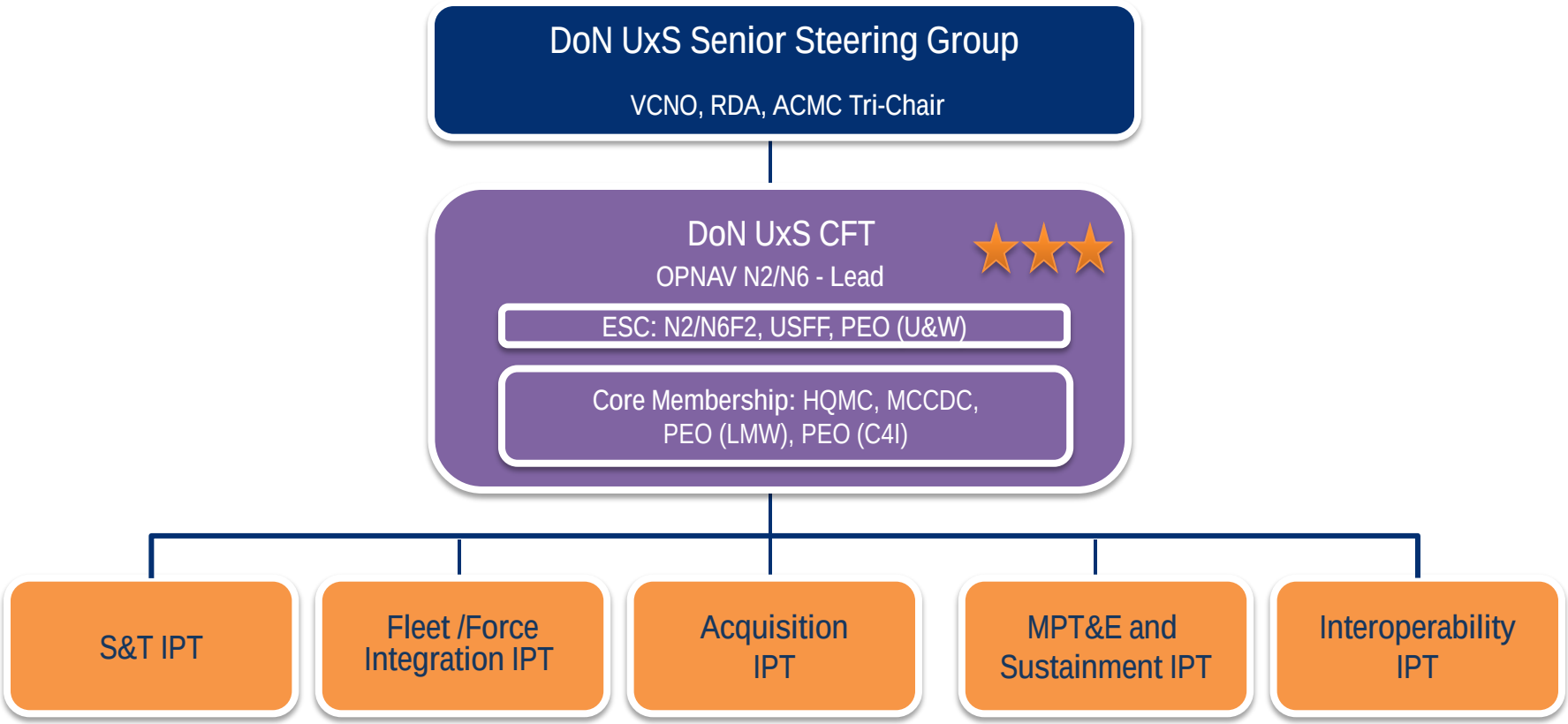

NAVAL UNMANNED SYSTEMS FUNCTIONAL CROSS WALK

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S&T IPT

GAP ANALYSIS

- Assess and prioritize Technology Gaps
- Develop a UxS S&T Roadmap to close technology gaps

FLEET/FORCE INTEGRATION IPT

SOLUTIONS ANALYSIS

- CONOPS development
- Develop Future Mission Threads and compare to "As Is" mission thread performance to better define the performance gap
- Develop a UxS Experimentation Campaign Plan integrated with USFF Sea Trial Campaign Plan. Evaluate UxS CONOPS and Future mission threads

INTEROPERABILITY IPT

PRODUCT IMPROVEMENT

- Develop "As IS" mission threads and assess performance gaps
- Develop / coordinate Interoperability standards (Joint, commercial)
- Develop Interoperability E2E testing process guide

MPT&E AND SUSTAINMENT IPT

ACQUISITION & PROGRAMMING

- Support the development of Non-materiel solutions
- Develop roadmaps for Training, Workforce Development and Sustainment

ACQUISITION IPT

- Transition technology provided by S&T IPT into rapid prototyping
- Take the outputs from the other IPTS and provide inputs to the POM process

ENGINEERING SUPPORT TO IPTs

- SYSCOM Field activity personnel offered as Deputy to IPT Leads
- Stakeholder organizations from the Mission Area Engineers and Technical Directors' Consortium offer dedicated participation for engineering and analysis support coordinated by the Deputy IPT Lead
- Technical breadth and depth of stakeholder team participants offers:
  - Solution recommendations thoroughly vetted to highlight mission impact vice bias towards platform protection or justification
  - Opportunities to leverage all of the varied communities prior investments
  - Mitigation of future interoperability stovepipes inherent in a collaborative engineering environment
  - Opportunities to limit future fiscal constraints from Contractor Furnished Equipment

NEXT STEPS

- Sufficient resources are on hand for initial pacing and phasing the standup of the IPTs. IPTs will be meeting in the next couple of months.

- Soliciting Navy sponsorship of a Limited Objective Experiment in late FY 11 to evaluate CONOPS for integrated manned and unmanned operations.

- The Mission Engineering Consortium is taking the opportunity to apply Department wide resources to SECNAV, CNO, and CMC priorities in Unmanned Systems

  - Apply Mission Engineering processes towards high priority tasking in Unmanned Systems (UxS) engineering
  - Aligns DON engineering competencies towards current efforts
    - UxS Cross Functional Teams
    - Information Dominance Roadmaps
    - PEO LMW and PEO U&W Programs
    - Warfare Center Technical Authorities

Provides Mission Level System Engineering and Analytical Rigor