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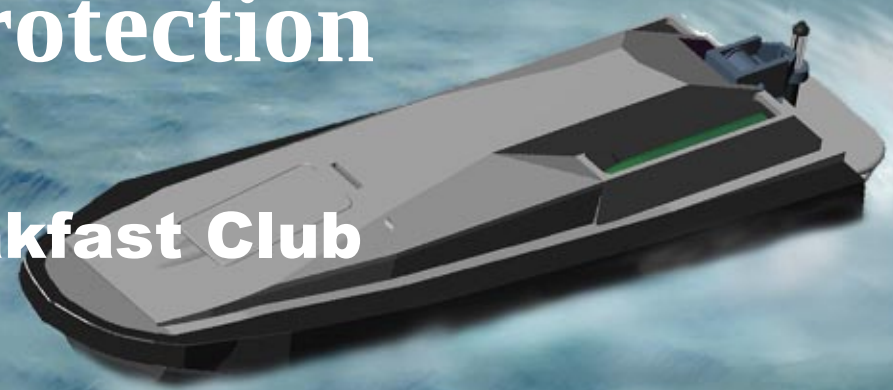
SPARTAN "SCOUT"

FY02 ACTD Candidate

Unmanned Surface Vehicle (USV) for Battlespace Dominance and Force Protection



Presented To

ACTD Breakfast Club

Presented By

DR. VIC RICCI

Strategic Planning & Development Office, Code 31B

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NAVAL UNDERSEA WARFARE CENTER DIVISION, NEWPORT, RI

"We Don't Want to Get Shot in the Face When We Go into the Littorals!"

OPNAV N763
Surface Warfare Division

Captain Craig T. Knouse
31 May 2001

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SPARTAN SCOUT
Warfighting Need

FY02 ACTD Candidate

ARMY

- *RSTA/ISR*
- *Force Protection/Harbor Security*
- *Precision Strike*
- *Anti-Access*
- *Bottom-Mapping & Bathymetry*

NAVY

- *Force Protection*
- *ISR*
- *Precision Strike*
- *Shallow Water ASW*
- *Amphibious Operations*
- *Coastal Surveillance*
- *ISMA and MIW*

SPECIAL WARFARE

- *Special Reconnaissance*
- *Hydrographic Reconnaissance*
- *VSM Mine Countermeasures*
- *Deception Operations*

MARINE CORPS

- *Amphibious Warfare*
- *Force Protection*
- *Expeditionary Logistics*
- *Sustainment and Resupply*
- *VSW MIW*

COALITION FORCES

NAVY REPUBLIC OF SINGAPORE

- *Shallow Water ASW*
- *Force Protection*
- *Coastal Patrol Anti-Piracy*
- *Shallow Water MIW*

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SPARTAN SCOUT
Overall ACTD Objective

FY02 ACTD Candidate

- **OBJECTIVE: Demonstrate the Military Utility of USVs for *Assured Access* and *Force Protection* in the Littorals**
  - *Prepare the battlespace for **Amphibious and Sealift Ops***
  - *Increase Battlespace Awareness - Networked ISR*
    - » Perform ***"SCOUT"*** missions
  - *Demonstrate benefit of **extended intelligence gathering** unmanned ISR, Precision Strike, and USW capabilities provided by USVs*
- **Demonstrate USVs as a primary *Force Leveler* and *Force Multiplier* against asymmetric threats**
- ***Minimize or eliminate unnecessary risk* to Personnel and Capital Assets**

> **". . . the movement of sensors becomes as important as the movement of shooters within the battlespace."**
>
> **- VADM Cebrowski, NWC**

SPARTAN SCOUT

Levels the Battlespace by Distributing the Combat System

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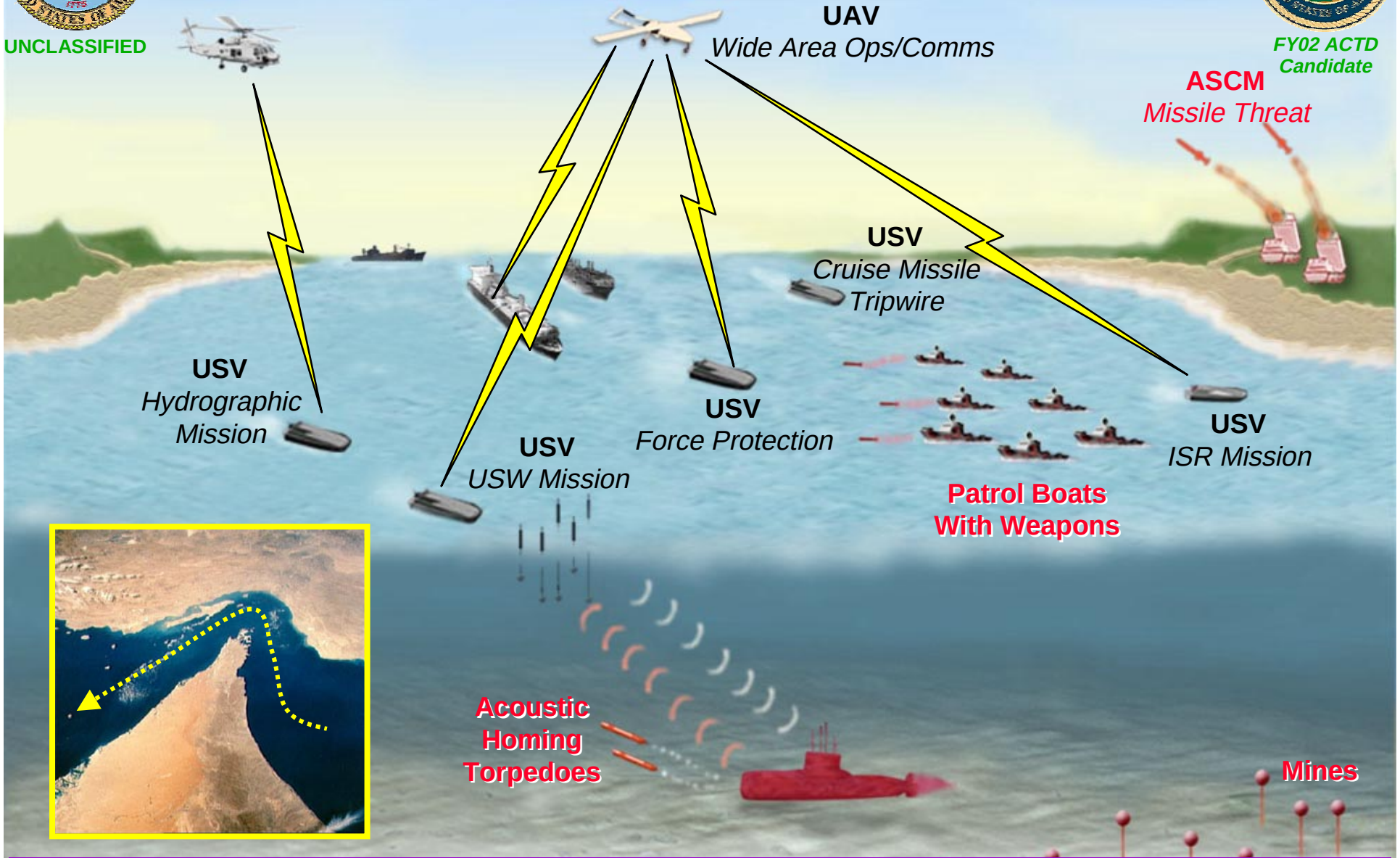

GROWING ASYMMETRIC THREAT IN THE LITTORALS REQUIRES SYMMETRIC RESPONSE

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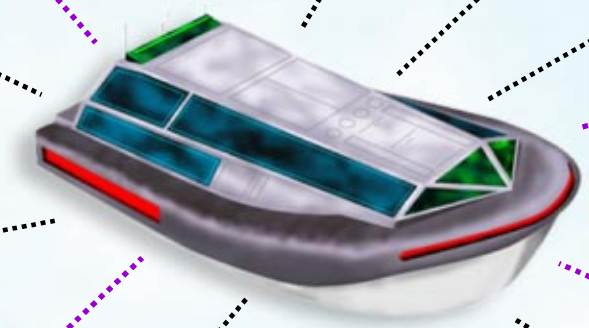
SPARTAN SCOUT
Mission Demonstrations



Precision Strike

- AMPHIBIOUS WARFARE SUPPORT
- CRUISE MISSILE TRIP WIRE
- BROWN WATER SURVEILLANCE
- TACOCEAN

Shallow Water USW

- TD

ISR/RSTA/ BDA

- UAV SUPPORT
- DECOY
- RAPID RESPONSE ESTABLISH NAVAL PRESENCE
- COUNTER SOF

Force Protection Harbor/Port Security

- ISMA
- SHORE FIRE SUPPORT
- ACOMMS/ COMMS RELAY

RECONFIGURABLE USVS ENHANCE BATTLEFORCE EFFECTIVENESS AND FLEXIB ILITY

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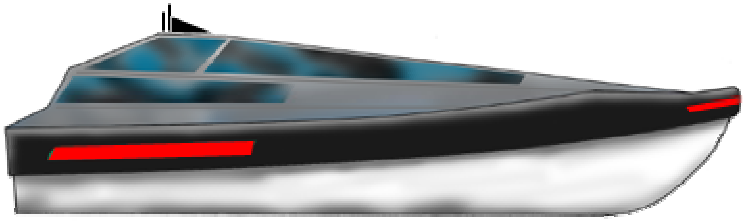
SPARTAN SCOUT
Capabilities With Existing Technology

FY02 ACTD Candidate

- **High Endurance, Long Range w/ Loiter Capability**
  - *Time: up to 48 hours (continuous)* ***[8 hrs]***
  - *Range: up to 1000 nmi* ***[150 nmi]***
- **Transit Speeds > 50 kts (in SS3) [28kts]**
- **Large Payload: up to 5,000 lbs [2,600 lbs]**
- ***EXTEND* the Operational Environment**
  - *Chemical/Biological*
  - *Inclement weather*
    - » Higher Sea States than Manned Operations
  - *Night operations*
- **Multi-Mission, Rapidly Reconfigurable**
- **Multiple Methods for Deployment**
  - *Surface ship deployed*
  - *Launched from land (forward deployed)*
  - *Air dropped*



11-meter USV
[7-meter]

SPARTAN:
"... ANYTIME, ANYWHERE"

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SPARTAN SCOUT

Plug 'n Play Modularity Increases Capability

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USV Core System + { **ISR-FP Module** / **Precision Strike Module** / **USW Module** } = { **Assured Access** / **Expanded Battlespace Dominance** / **Enhanced Net-centric Capability** / **USW Threat Neutralization** }

CORE SYSTEM

+

RECONFIGURABLE "PLUG 'N PLAY" MISSION MODULE

=

WARFIGHTING CAPABILITY

MODULAR PLATFORM ENABLES ADAPTABILITY TO MEET NUMEROUS WARFIGHTING NEEDS WITH ONE CORE SYSTEM

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SPARTAN SCOUT
Core System

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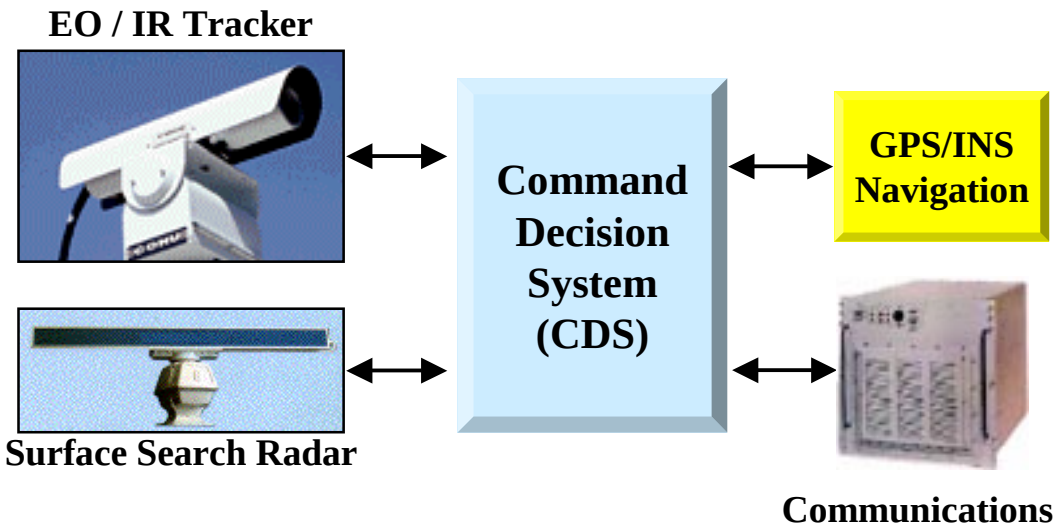
Existing Navy Standard RHIB & Davit



REQUIRED CORE SYSTEMS

- ✓ *CDS with Remote/Autonomous Control*
- ✓ *Surface Radar*
- ✓ *CCD/IR Camera*
- ✓ *GPS Navigation*
- ✓ *High-Bandwidth Communications*

USE EXISTING LOGISTICS - INTEGRATED FIELDED SYSTEMS

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SPARTAN SCOUT

Command & Control of Multiple USV's

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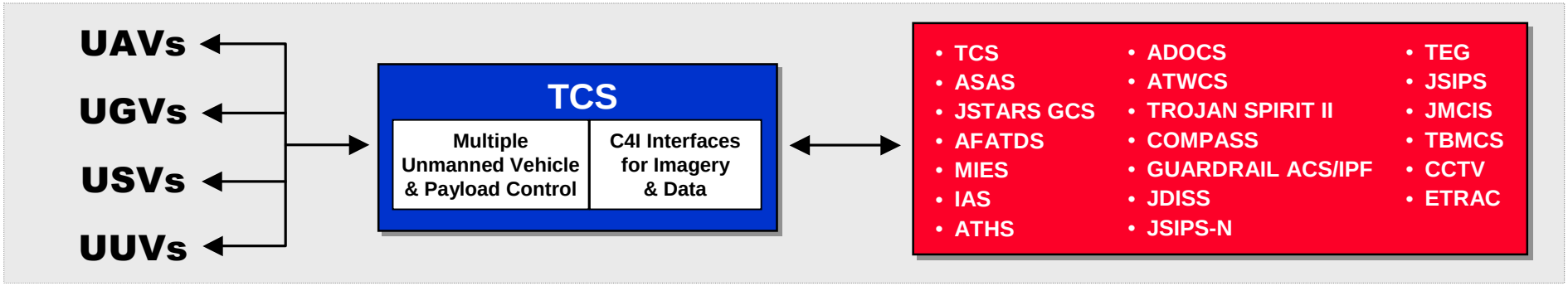
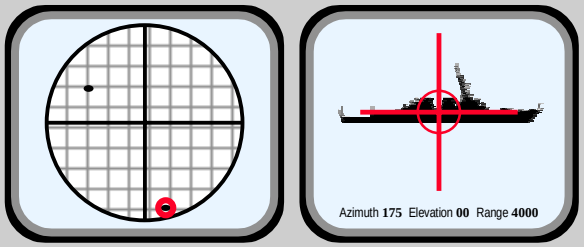


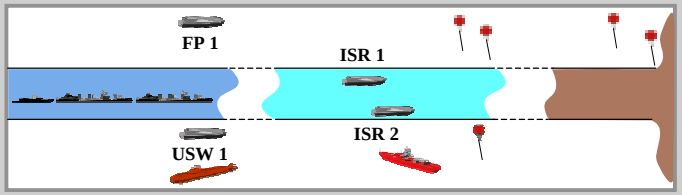
Proposed TCS Display

SENSOR CONTROL/ANALYSIS



	RADAR	FLIR	CAMERA	ALFS	AQS-20	TARGET
ISR 1	L	R				
ISR 2				ALERT		
FP 1						
USW 1						
Scan One Sensor	← →	↑ ↓	Scan One Platform	Scan All Platforms	Faster	Slower

4 USV CONTROL



	SPEED	HEADING	WP1	WP2	WP3	RELATIVE
HOST			←		→	ABSOLUTE
ISR 1						SPD/HDG
ISR 2						LOITER
FP 1						RETURN
USW 1						EVADE

INTEROPERABLE AND SCALEABLE COMMAND, CONTROL, COMMUNICATIONS, AND DATA DISSEMINATION SYSTEM

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SPARTAN SCOUT
Communications

FY02 ACTD Candidate

- **Line of Sight (LOS)**
  - *Tactical Common Data Link (TCDL)*
    - » anti-jamming, Ku-Band, 10.71 Mbps
      - – Asymmetric, bi-directional (200 Kbps up / 10.71 Mbps down)
      - – Directional and omni mode
    - » 13-18 nmi LOS range
  - *Tactical Control Station (TCS)*
- **Over-The-Horizon (OTH)**
  - *Helo/UAV/USV relay*
- **SPARTAN ACTD goal of LOS Communications**
  - *Preliminary demonstration of OTH with UAV in Final Demo*

SPARTAN UTILIZES EXISTING/UPCOMING COMMUNICATIONS SYSTEMS

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SPARTAN SCOUT
Demonstration

FY02 ACTD Candidate

- **DEMO 1:** *ISR/RSTA Force Protection with one SPARTAN*
- **DEMO 2:** *Undersea Warfare with two SPARTANS*
- **DEMO 3:** *Precision Strike with one SPARTAN*
- **FINAL DEMO:** *Control of Multiple (3 to 4) SPARTANS*

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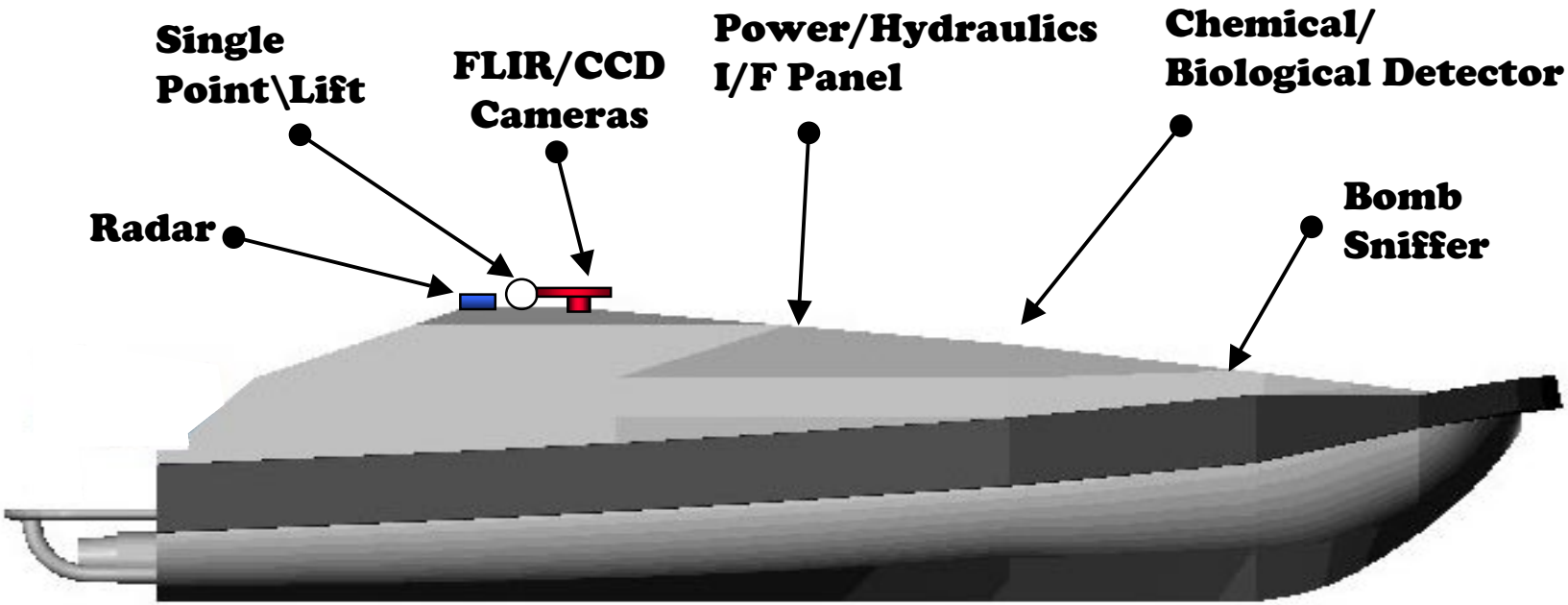
SPARTAN SCOUT
ISR-FP Module

FY02 ACTD Candidate



MODULE INCLUDES

- ✓ *Core USV ISR Package*
- ✓ *Chemical/Biological Detectors*
- ✓ *Bomb Sniffer*

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SPARTAN SCOUT
Demo 1: ISR Force Protection CONOPS
Threat Detection

FY02 ACTD Candidate

SPARTAN CAN INSPECT MARITIME SHIPPING AND PIER SIDE INSTALLATIONS

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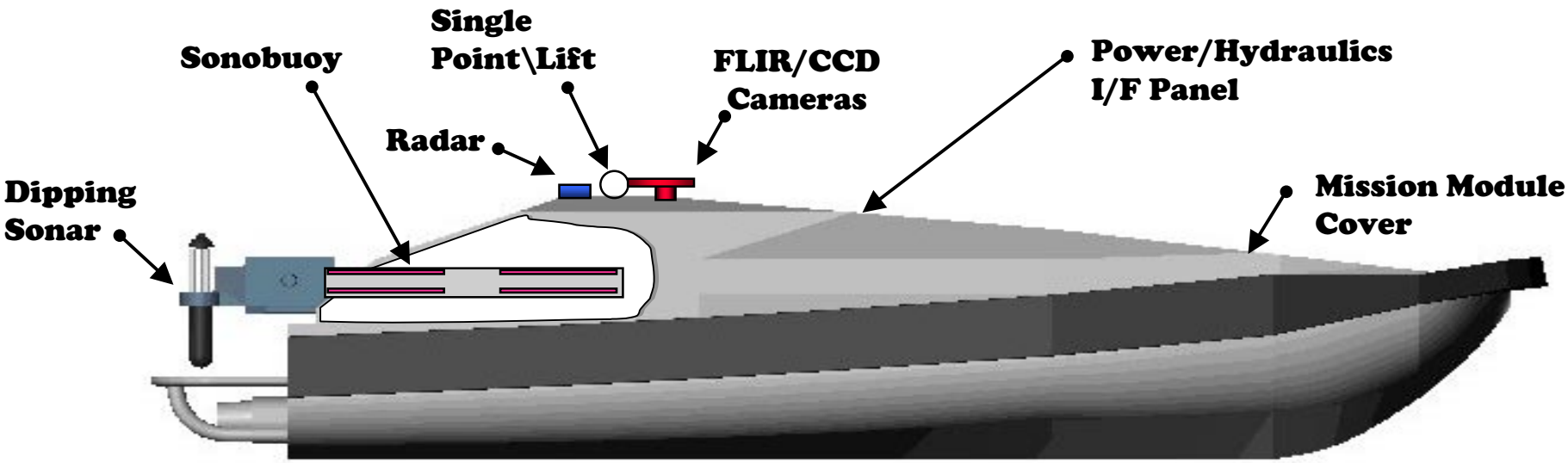
SPARTAN SCOUT
USW Module

FY02 ACTD Candidate



Airborne Low Frequency System (ALFS)

Sonar

Reeling Machine

Transmitter/Receiver

MODULE INCLUDES

- ✓ *2 Modular Horizontal Launcher Systems (MHLS)*
- ✓ *20 Sonobuoys (12" Diameter)*
- ✓ *ALFS*

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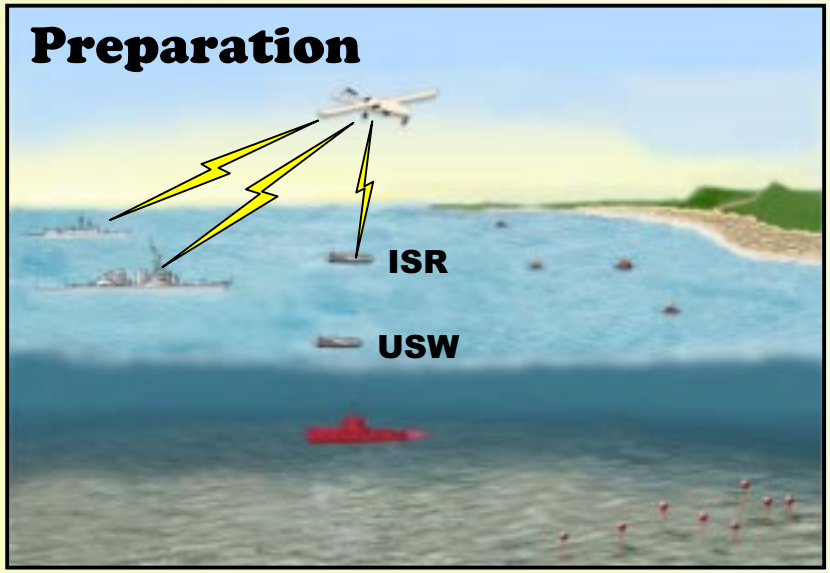
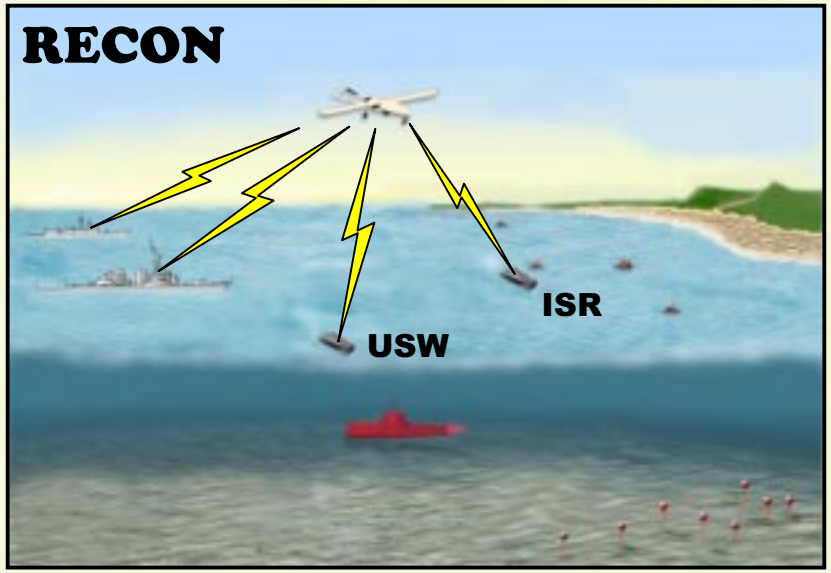
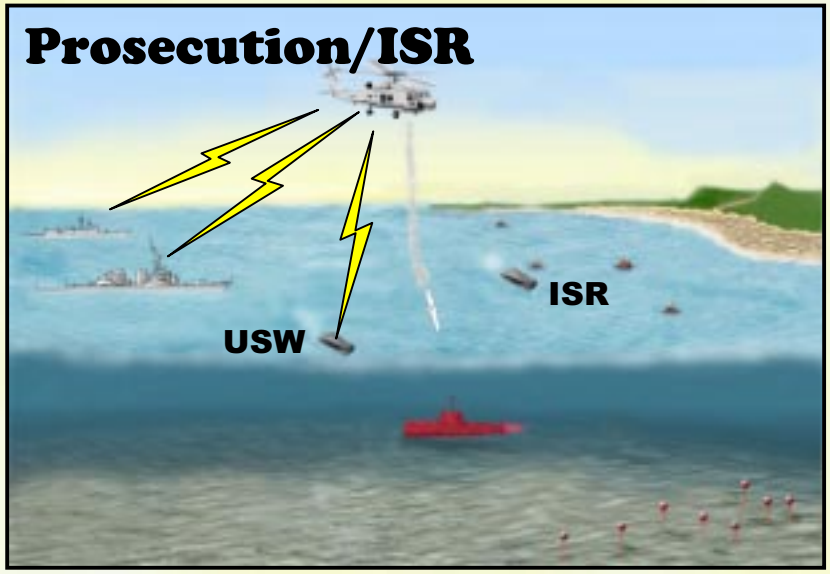
SPARTAN SCOUT
Demo 2: Littoral USW CONOPS
Amphibious Landing - STOM

FY02 ACTD Candidate







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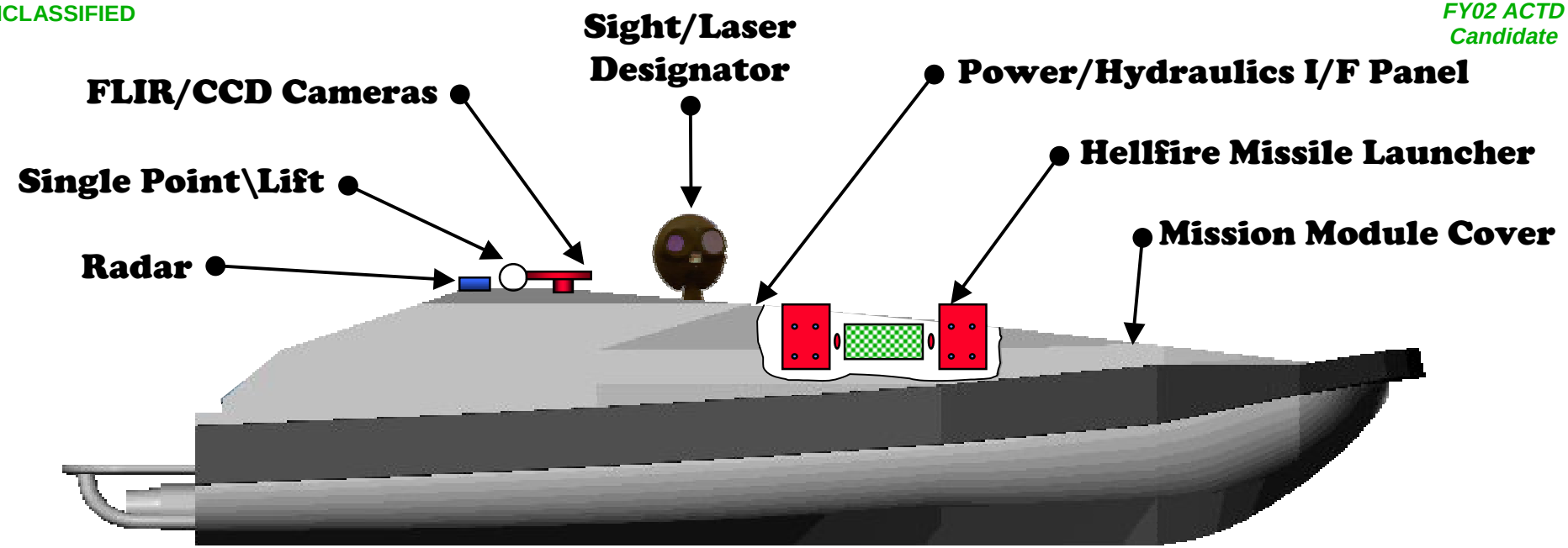
SPARTAN USV
Precision Strike Module

FY02 ACTD Candidate



HELLFIRE MISSILE

RAILS

MODULE INCLUDES

- ✓ *4 Hellfire Missiles*
- ✓ *Sight/Laser Designator*
- ✓ *Launcher Rails*

SPARTAN PROVIDES AN INTEGRATED SENSOR AND WEAPON SYSTEM

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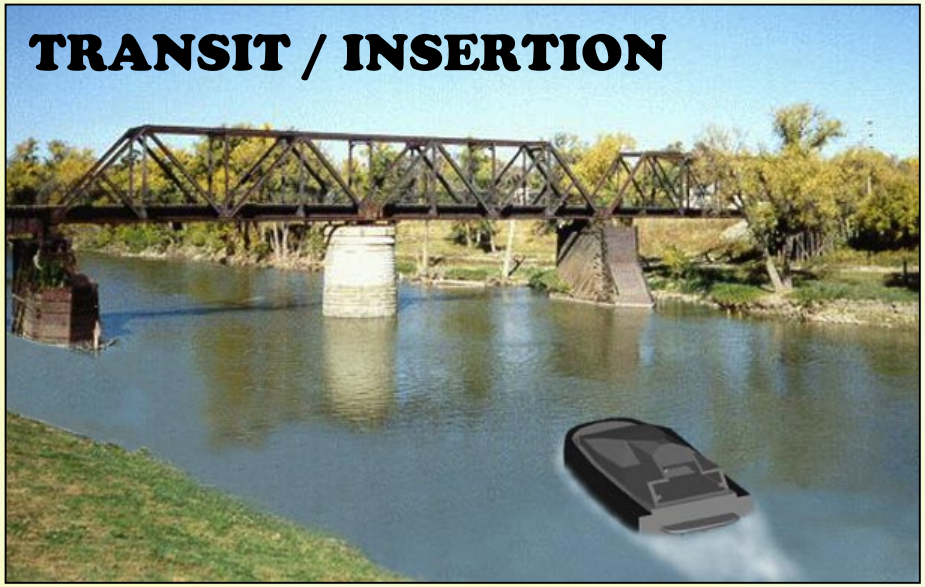
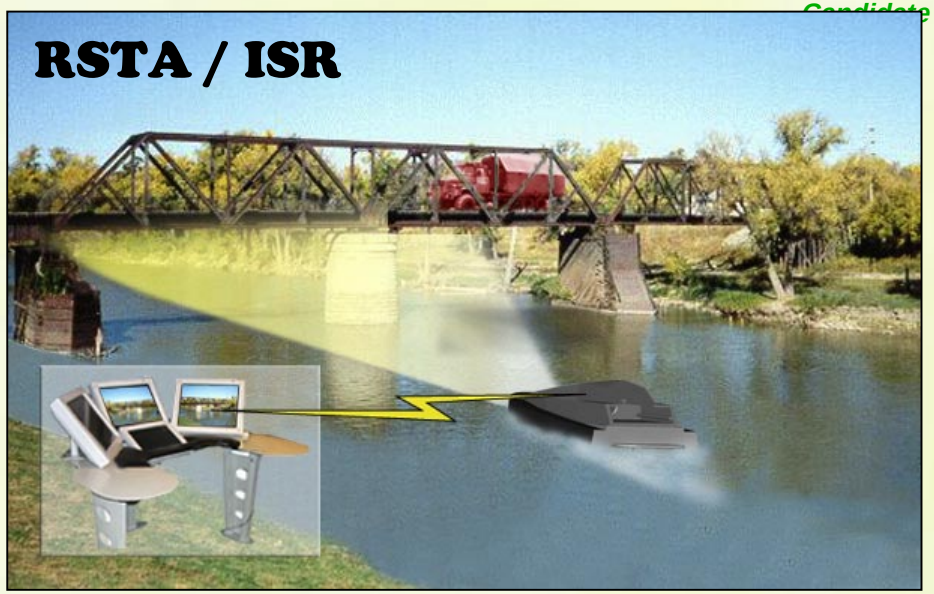
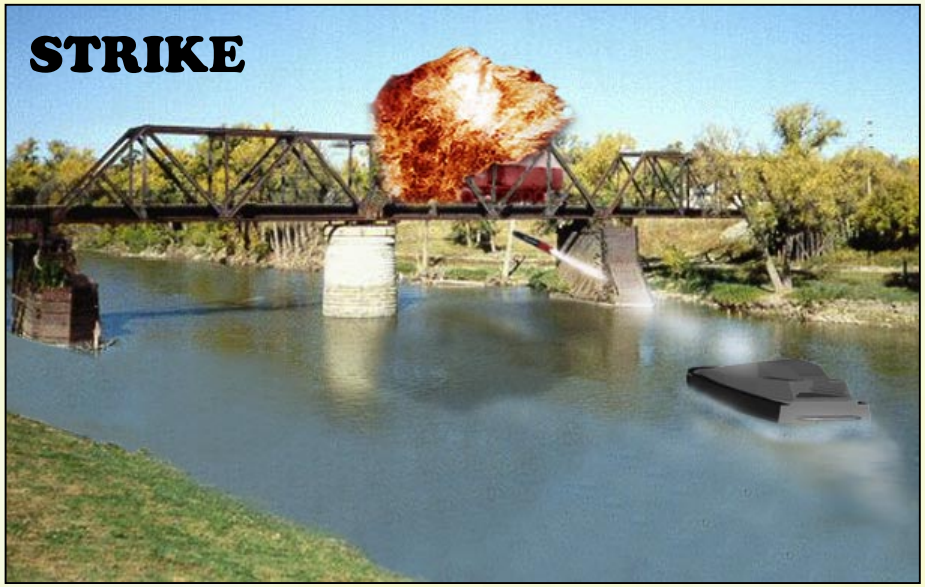
SPARTAN SCOUT
Demo 3: Precision Strike CONOPS
Real-Time Brown Water Operations

FY02 ACTD Candidate







SPARTAN SCOUT
Final Demo: Control of Multiple USV's

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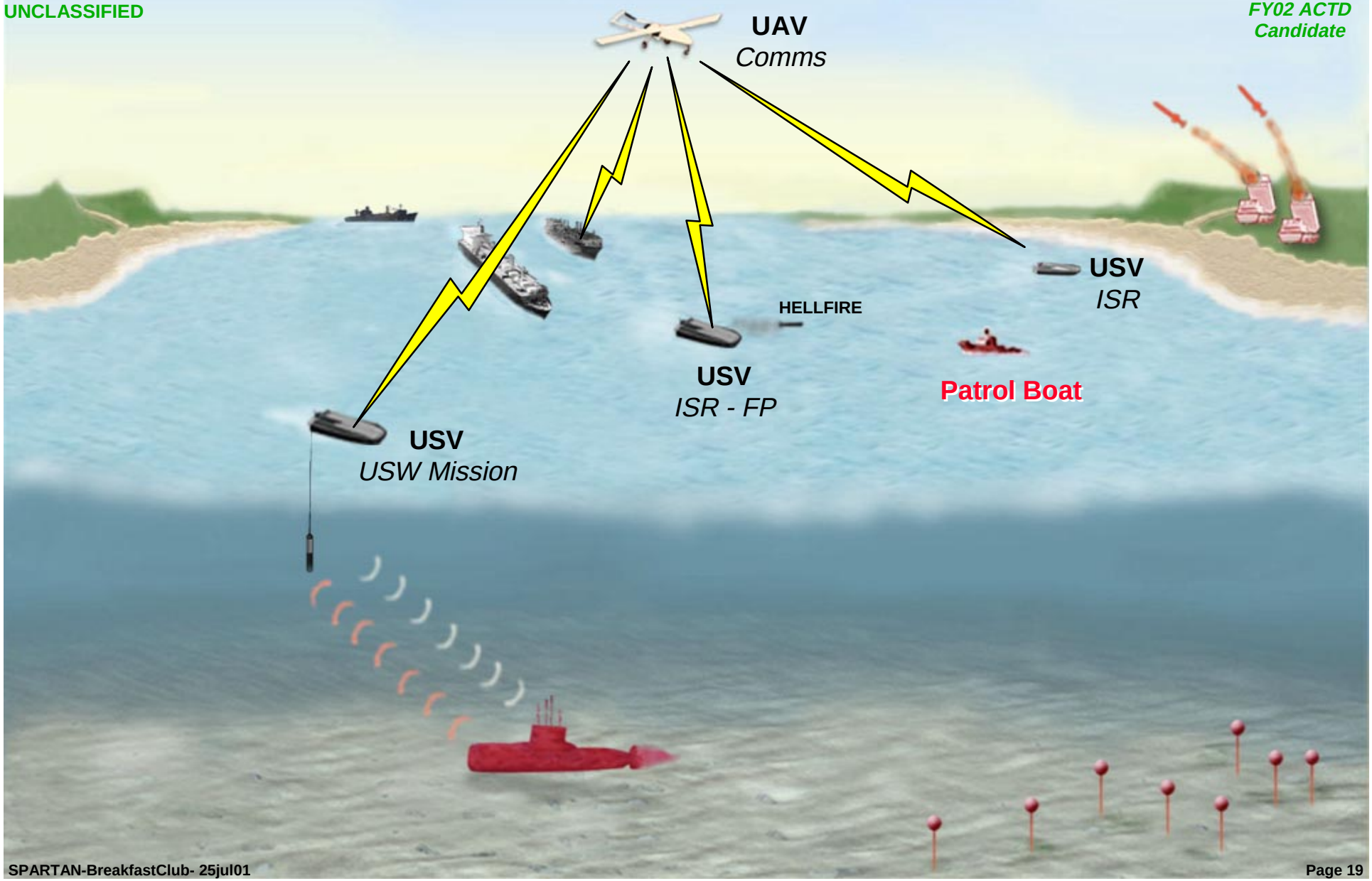

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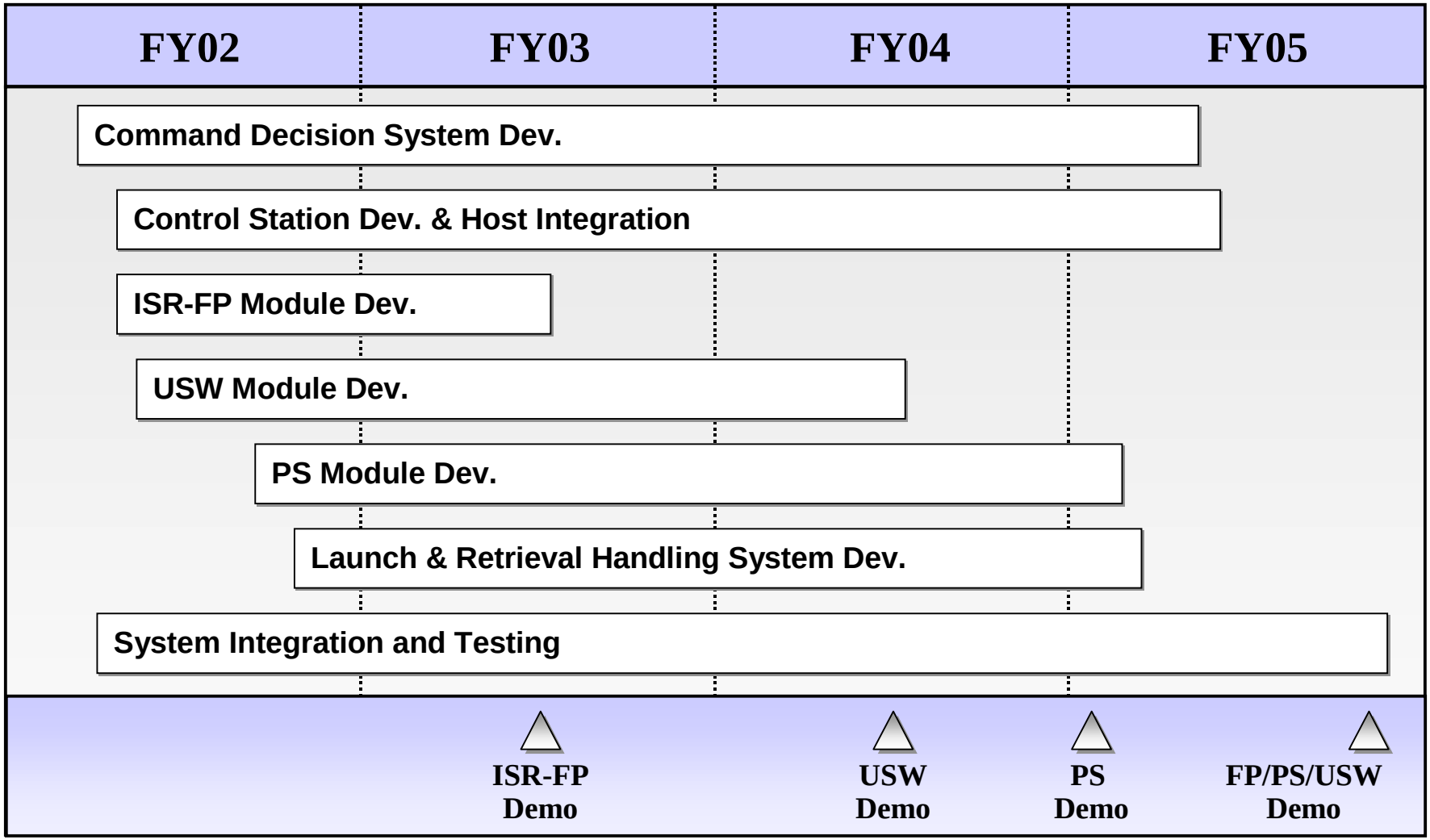
SPARTAN SCOUT
Schedule

FY02 ACTD Candidate

*SPARTAN SCOUT ACTD Plan of Action and Milestones**



** Final schedule TBD*

SPARTAN SCOUT
Participants

- **TECHNICAL**
  - ***Navy***: *NAVSEA (NUWC)*
  - ***Army***: *AMRDEC, TRADOC*
  - ***Singapore***: *RSN*
  - ***Industry***: *Raytheon, Northrop Grumman, TEAM ONE USA*
- **OPERATIONAL**
  - ***CINC Sponsor***: *PACOM*
  - ***Operational Manager (OM)***: *COMSEVENTHFLEET*
  - ***Users***: *7th Fleet, Army (FPBL), RSN, MARFORPAC - (TBD), COMNAVSPECWARCOM (TBD)*
- **SPONSORS**
  - *Navy (OPNAV N76), Army (AMRDEC), Republic of Singapore, DUSD (AS&C), ONR - TBD, SOCOM - TBD*

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SPARTAN SCOUT
ACTD Costs: *Spend Plan*

FY02 ACTD Candidate

Item	FY02	FY03	FY04	FY05	TOTAL
Core System ("The Truck")	4.0	6.4	5.7	4.4	**20.4**
L&R - Host Sys Integ	0.8	1.0	1.7	0.8	**4.3**
USW (Base) Module	0.5	1.0	1.0	0.7	**3.3**
Enhanced ISR-FP Module	0.8	1.3	1.3	1.0	**4.4**
PS Module (with Hellfire)	0.6	0.8	1.2	1.5	**4.1**
USW (ALFS) Module	1.0	3.9	2.1	1.3	**8.3**
TOTAL	**7.6**	**14.5**	**13.1**	**9.6**	**44.8**

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SPARTAN SCOUT
ACTD Costs: *Resource Plan*

FY02 ACTD Candidate

Sponsor	FY02	FY03	FY04	FY05	TOTAL
Navy (OPNAV N76)	0.5	2.5	6.0	5.0	**14.0**
Navy (OPNAV N76) (ALFS) - TBD	0.5	2.1	2.2	1.5	**6.3**
*Army - AMRDEC**	0.3	0.3	0.4	0.4	**1.4**
*Army - FPBL**	0.15	0.15	0.15	0.15	**0.6**
Singapore - TBD	1.5	1.8	1.7	1.0	**6.0**
DUSD (AS&C)	3.7	6.7	1.9	0.9	**13.2**
*Industry IRAD**	0.8	0.8	0.5	0.5	**2.6**
NUWC	0.2	0.2	0.2	0.1	**0.7**
TOTAL	**7.6**	**14.5**	**13.1**	**9.6**	**44.8**

*** Leveraged Effort**

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SPARTAN SCOUT
Residuals

FY02 ACTD Candidate

- **RESIDUALS**
  - ***Three USVs***
  - ***Three Modules***
    - » **ISR/RSTA Module** (Joint - Army, Navy, Singapore)
    - » **Precision Strike Module with Hellfire Missile** (Joint - Army, Navy)
    - » **Shallow Water USW Module** (Joint - Army, Navy, Singapore)
  - ***CONOPs and Utility Assessment Report***
- **TRANSITION**
  - *Complete USV Transition Plan to be developed during the 4 year ACTD*
  - *Some low-level engineering development is anticipated during the 2 years of in-fleet service*
    - » Incorporate lessons learned into acquisition phase

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SPARTAN SCOUT
Summary

FY02 ACTD Candidate

- **Warfighting Need**
  - *Enable* **assured access** *for* **force projection** *in the littorals*
- **Technology**
  - *Leverages Existing Systems*
  - *Flexible and Modular Platform: Multiple Payload Options*
    - » Sensors and weapons
    - » Remote control/semi-autonomous/autonomous **"truck"** on water
- **Demonstrations**
  - *ISR/RSTA*
  - *USW*
  - *Precision Strike*
  - *Control of multiple USVs*
- **Residuals**
  - *Three USVs and three modules*
  - *CONOPS and Utility Assessment Report*