Sea Air Space Symposium

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USV Systems Vision
Enhanced, Efficient Capabilities

Key Enablers
- Endurance
- Autonomy & Precision Navigation
- Command, Control, & Communications
- Payloads & Sensors
- Platform Integration (L&R, etc.)

USV Systems Vision
Enhanced, Efficient Capabilities

Very Small (Class 1)
- Armed Coastal Patrol
- GARC
- Optionally Manned
- Mine Sweeping
- Mine Hunting

Small (Class 2)
- MHU 1-4 w/ AN/AQS-24
- USV w/Sweep (UISS)
- USV w/ Sweep or AN/AQS-20
- Technology Maturation, CONOPs, & Payloads

Medium (Class 3)
- Autonomy
- ASW
- ACTUV / MDUSV
- Ghost Fleet
- Armed Escort
- ISR
- Electronic Warfare
- UUV Launch
- ASW Tracking and Engagement
- mining and/or MCM
- Counter-Swarm
- TBD Hull Form
- MCM USV
- Comms Relay
- TBD

Note: Systems with Yellow background not PMS 406

Efficient, Executable Progression of Capabilities onto Common USV Hull Forms

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UUV Systems Vision
Enhanced, Efficient Capabilities

**Key Enablers**
- Endurance
- Autonomy & Precision Navigation
- Command, Control, & Communications
- Payloads & Sensors
- Platform Integration (L&R, etc.)

**UUV Systems Vision**
Enhanced, Efficient Capabilities

**Small**
- (Man Portable)
- (Surface or Submarine Launch)
  - LBS-G
  - Mk18 Mod 1 (Swordfish)
  - Sandshark

**Medium**
- (Surface or Submarine Launch)
  - LBS-AUV
  - LBS-AUV(S)

**Large**
- (Surface or Submarine Launch)
  - Mk18 Mod 2 (Kingfish)
  - LBS-G

**Extra Large**
- (Pier Launch)
  - ONR Innovative Naval Prototype

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Efficient, Executable Progression of Capabilities through Various UUV Systems

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Examples of Systems

- Mine Hunting Units (MHU)
- Unmanned Influence Sweep System (UISS)
- Knifefish UUV
- Snakehead LDUUV

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Summary

- LCS is the first ship class designed and built from the keel up to support unmanned systems
  - Unmanned Systems key to success of LCS and its mission packages
  - Modularity allows inclusion of latest and greatest technology as systems evolve

- Unmanned systems are growing
  - Key enabler for both LCS & Undersea Enterprise
  - Expand the Navy’s warfighting capability by relieving the burden of existing mission tasks and introducing new possibilities

- Incremental approach to delivering capability
  - Leverage and improve enabling technologies

Unmanned Systems are Vital Part of Future Navy Force
Questions?
### Acronym List

- **ACTUV** | Autonomous Continuous Trail Unmanned Vehicle
- **ASW** | Anti-Submarine Warfare
- **ASuW** | Anti-Surface Warfare
- **EW** | Electronic Warfare
- **IPOE** | Initial Preparation of Operational Environment
- **ISR** | Intelligence, Surveillance, & Reconnaissance
- **LBS-G** | Littoral Battlespace - Glider
- **LBS-AUV** | Littoral Battlespace – Autonomous Underwater Vehicle
- **LBS-AUV(S)** | Littoral Battlespace – Autonomous Underwater Vehicle (Submarine)
- **MCM** | Mine Countermeasures
- **MDUSV** | Medium Displacement USV
- **MHU** | Mine Hunting Unit
- **MIW** | Mine Integration Warfare
- **MUSCL** | Modular Unmanned Surface Craft, Littoral
- **P3I** | Pre-Planned Product Improvement
- **USV** | Unmanned Surface Vehicle
- **UUV** | Unmanned Undersea Vehicle

**Unmanned Systems are Vital Part of Future Navy Force**