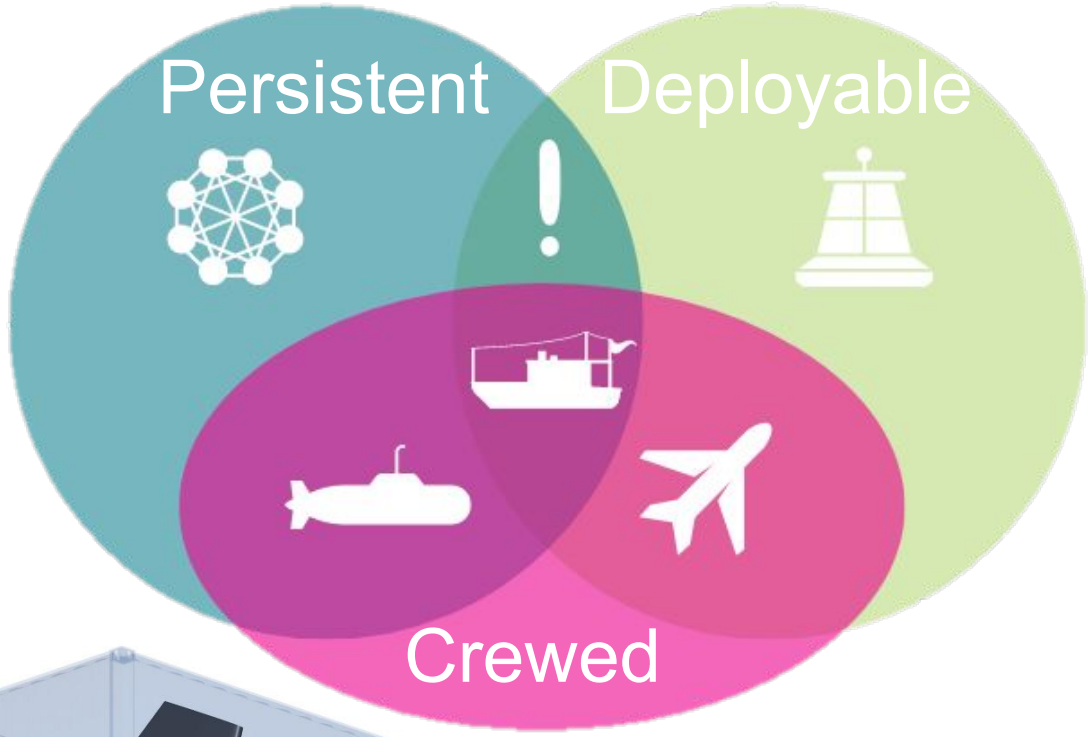
Submarine
Delivery Agency

Submarine Delivery Agency Autonomy Unit CNE Brief 2023

Gavin Tapsfield Deputy Team Lead

Structure

- Autonomy Unit overview
- Project CHARYBDIS overview & update
- Project CETUS overview & update



Autonomy Unit Purpose

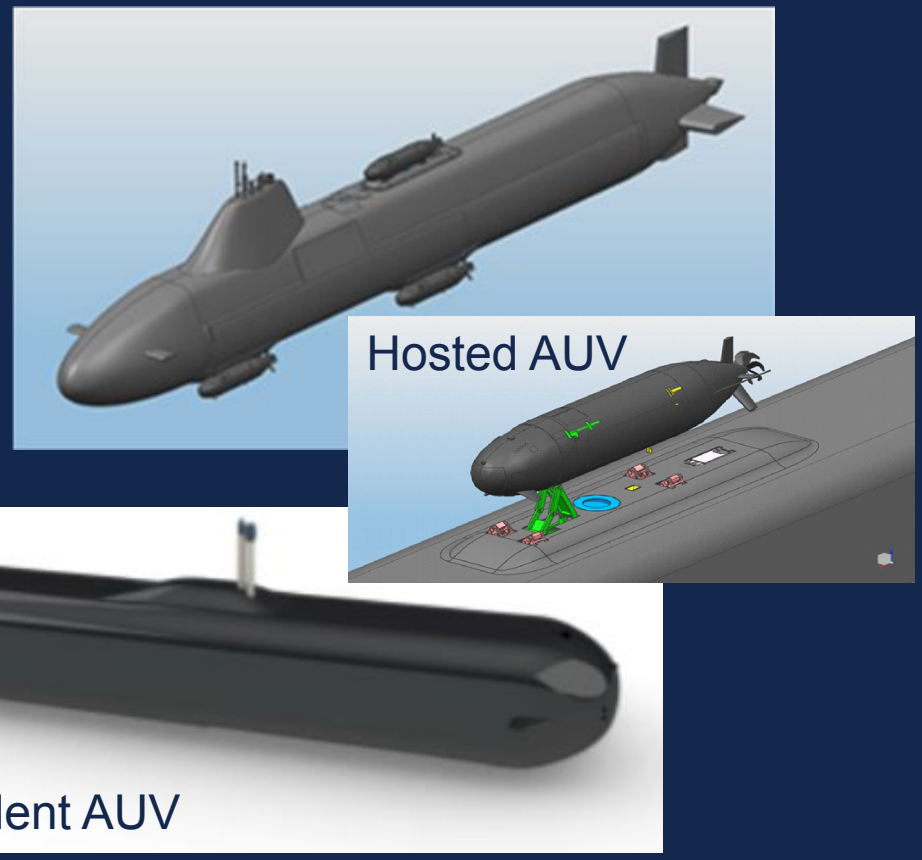
- **“Make SDA the "agent of choice" for the cost-effective and timely delivery and support of autonomous and semi-autonomous vehicles and systems to exploit the underwater battlespace"**

Mark Hyde

Head of SDA-AU

Autonomy Unit origins

- **MUFC Concept Studies** (Informing SSN(R)) found:
  - Significant Value of Autonomy to Complement SSN(R) across range of roles and scenarios
  - Large Numbers of AUV likely to be needed by ~2040
- **Urgent RN need for more Underwater Assets**
  - Increased activity underwater and on seabed
  - Need to augment limited SSN Numbers
    - More assets
    - Better use of crewed assets.
- **RN vision for Future Underwater Battlespace**



Autonomy Unit Programme

Core Work

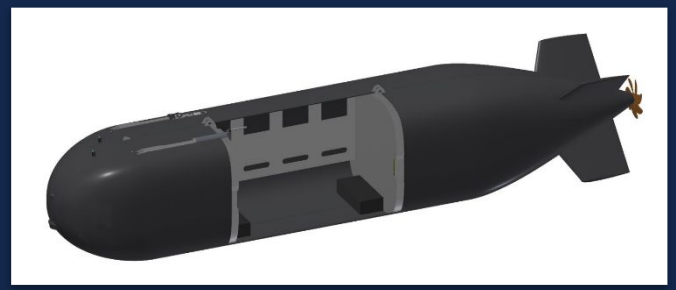
Advice and Studies

- AUVs for SSN(R) COEIA
- SSN AUV Hosting
- **S201 XLUUV Platform Auth**
- **Modular AUV Safety Case**

Current Specific Project Delivery including:

Project CETUS

Extra Large AUV Demonstrator system



Part of ASW Spearhead Annex H

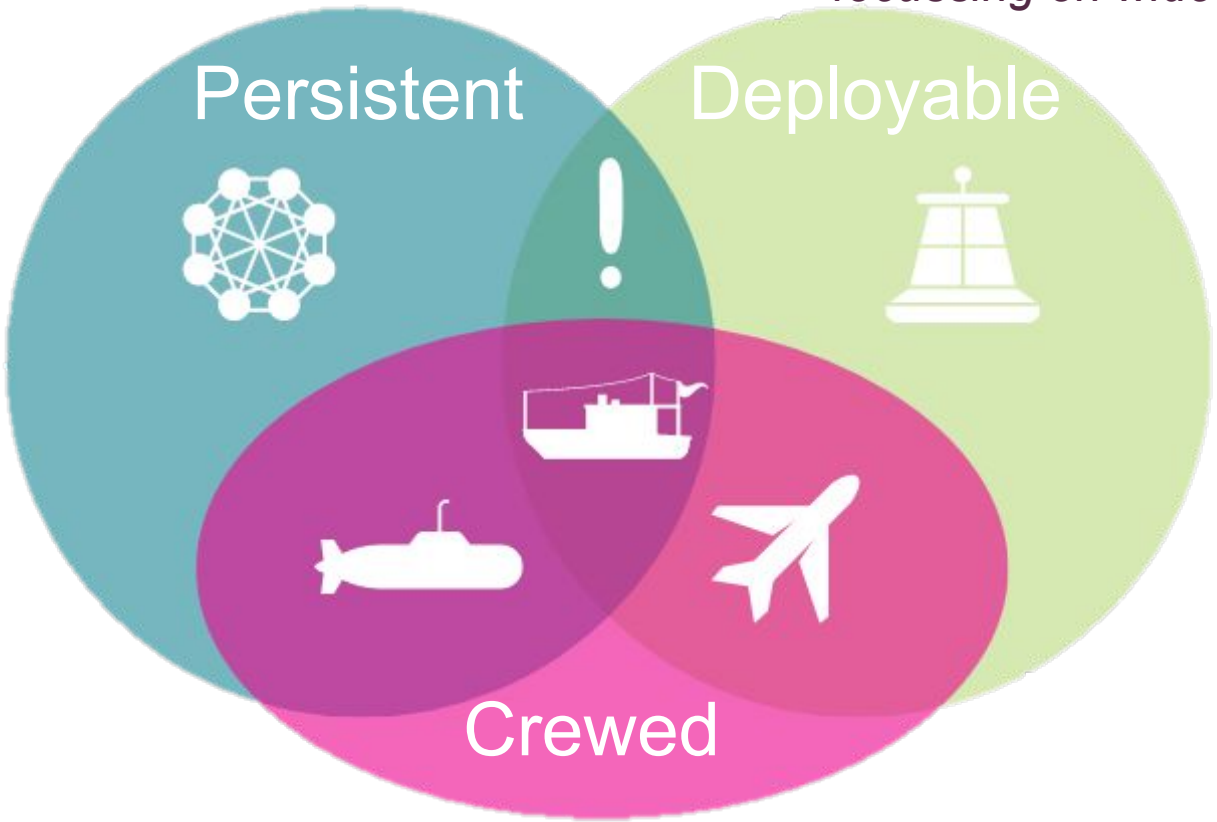
Project CHARYBDIS

Concept Exploration of Autonomous ASW

Part of ASW Spearhead Annex F

What is CHARYBDIS?

Capability: Persistent, Deployable, Uncrewed ASW Surveillance,
focussing on wide areas of Ocean.



- Deploy
- Detect
- Classify
- Localise
- Report

Project:

- Identifies technological opportunities e.g. Autonomous platforms.
- Prototypes & proves them, at full scale, in wide areas of ocean.
- Rapidly delivers them at scale.

Systems (of systems): The full range of system types/concepts & maturities

What will CHARYBDIS be?

Example solution types

- Covert / Overt
- Deployed / Self-deploys
- Recoverable / Disposable
- Exotic / Numerous

Example sensor types

- Active / Passive
- Acoustic / Non-acoustic

Example platform types

Could be propelled, drifting or anchored.

Air / Space

Surface

In-water

Seabed

Currently available — **Maturity** — ~5 years to Prototype

How are we delivering CHARYBDIS?

System Exploration

Submarine Delivery Agency

- Identical £50k contracts for concept studies
- At least two overall ASW systems from each supplier.
- ~25 suppliers chosen spanning all supplier types/sizes, and a range of expected solution types.

Technology Exploration

Defence and Security Accelerator

- DASA market engagement conducted.
- Reports received.
- Largest industry response in DASA history.

External Project Exploration

- Workshops & data gathering to baseline UK and allied historic, ongoing and proposed projects.

Consolidate & Recommend

- System recommendations
- Technology recommendations
- Enabling recommendations

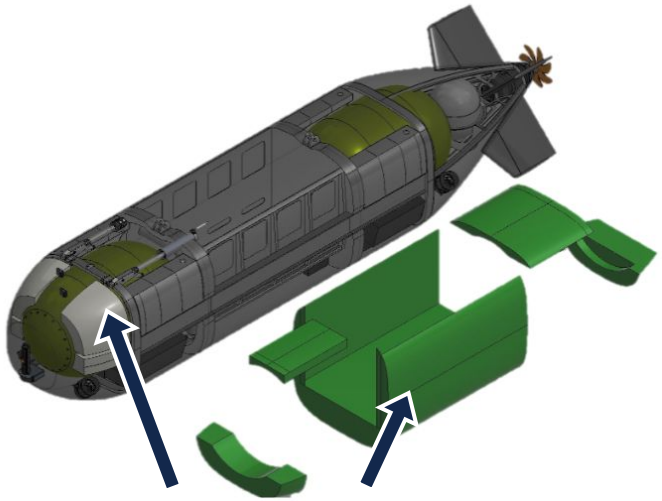
Verification & Validation

What is CETUS?

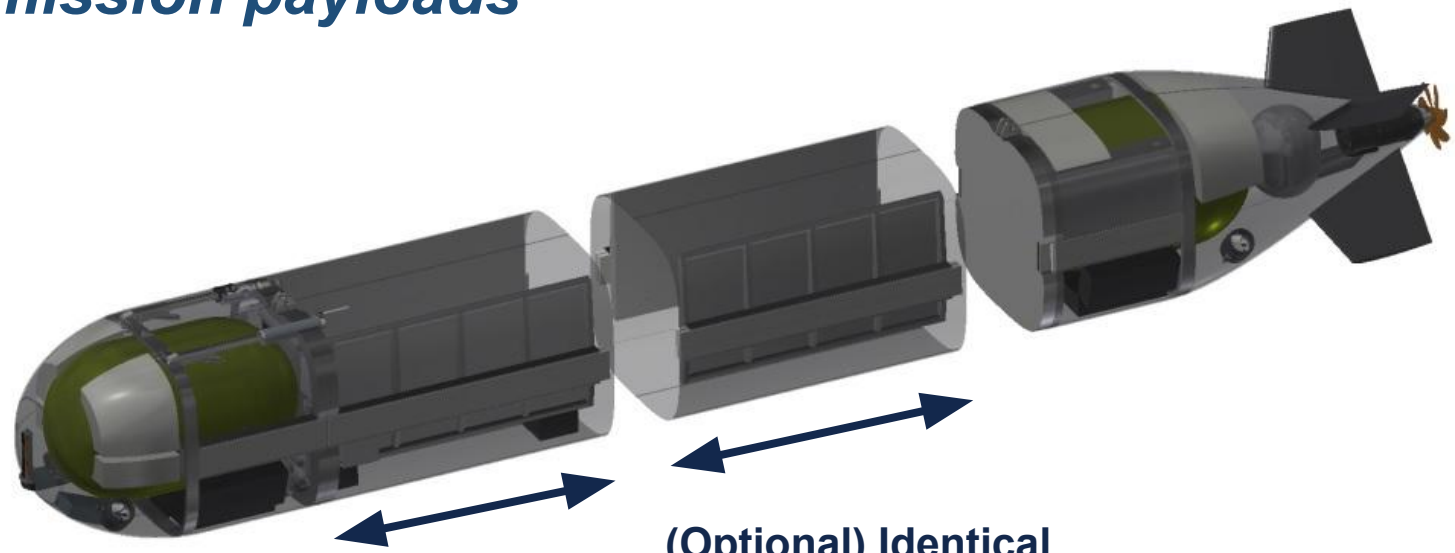
"A representative large scale AUV demonstrator to build trust in long endurance autonomous operations and be an adaptable testbed for demonstration of AUV mission payloads"

Key requirements

- Sized to fit 40' Shipping Container (12m long, 2.1m wide, 27 tonnes)
- Slow Top Speed (max = 10 knots)
- 100 hour (4 day) Battery Endurance (500kWh Lithium Polymer battery)
- 500m Deep Diving Depth



Additional Payload Spaces



Hull Module with (Primary) MPS

(Optional) Identical Hull Module with Second MPS

How are we delivering CETUS?

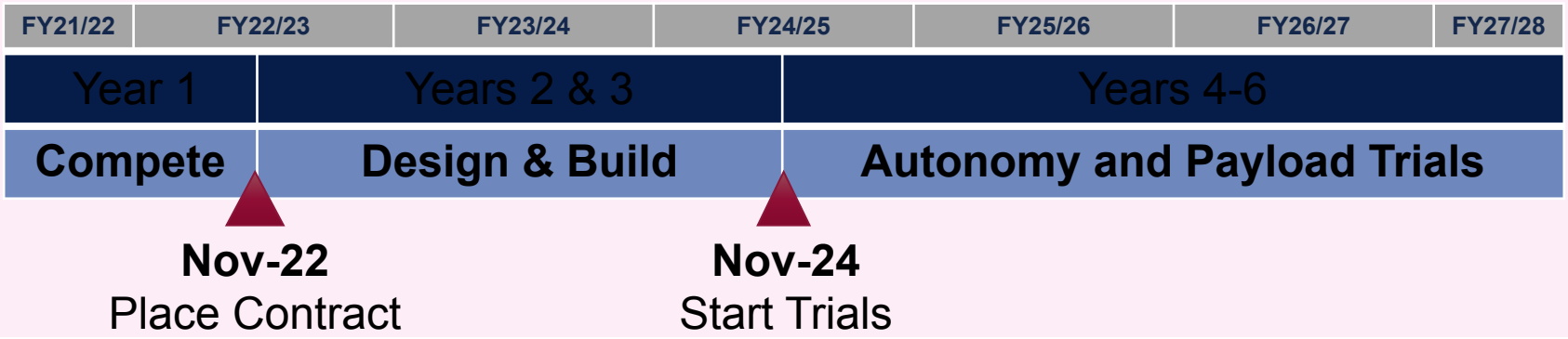
Scope:

- 6 year, £23m project, sponsored by Navy Develop (Underwater)
- Funded by Defence Innovation Unit (DIU) as part of “ASW Spearhead”

Strategy:

- Competitively let Design & Build Contract against Cardinal Point Specification
  - Won by MSubs Ltd
- RN owned and operated
- Contractor supported (under tasking)

Plan:



What will CETUS do?

- **Approach – RN Operated and Maintained – Contractor Supported**
- **De-Risk Autonomy**
  - **Underwater** - ***Move towards Full Autonomy***
  - **Surfaced** - ***Move towards "Regulatory approved" Supervision / Control at Distance***
- **Testbed AUV Mission Payloads**
  - Details dependant on Specific Payload Developments
  - Intend to explore 3 different use cases with major reconfiguration between each

Questions from chair

Q1. What are the current blockers to large scale exploitation of Maritime Uncrewed Systems (MUS) by Defence?

- Disproportionate process
- Priority vs Confidence

Q2. What can Defence do to accelerate the operational exploitation of MUS?

- Explore novel commercial routes
- Establish tools for coherence

Q3. What can Industry do to increase the operational maturity MUS?

- Accept open interfaces
- Innovate with realism

Questions?