ASW Capability Sponsor Navy DEVELOP

Cdr John 'JC' Conlin RN

Defence Nuclear Organisation

ROYAL NAVY

Strategic Command

[dstl]

ATLANTIS 2040

UNDERWATER BATTLESPACE

V1.0 (SEP 21)

Anti-Submarine Warfare Capability Roadmap [Redacted]

Improving our Operational Advantage in the Underwater Battlespace

Combined Naval Event 2023

THE IMPORTANCE OF ANTI-SUBMARINE WARFARE

Protecting our Strategic National Interests - The Underwater Battlespace (UWB) **is a domain of strategic national importance**, the home to our strategic nuclear deterrent and determines our ability to control **21st Century sea lanes of communications**, including the sub-sea cables and energy pipelines upon which our economy depend. Given their military virtues (reach, sensor range, denial of access, stealth and impunity), our **peer adversaries have invested heavily in their submarine forces in recent years.**

Anti-Submarine Warfare Force Level Outputs

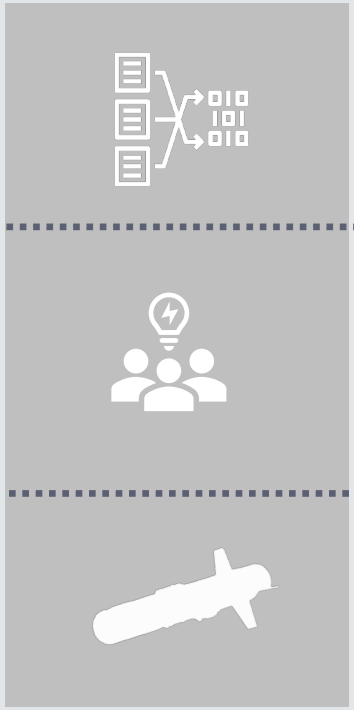
Operational Advantage in the North Atlantic
Protection of the nuclear deterrent and critical national infrastructure.

Persistent Engagement
Expeditionary ASW capability operating globally with strategic partners.

Carrier Strike
Deployed as part of a Maritime Task Group providing access, protection and resilience.

Littoral Strike
Support to theatre entry with persistent ASW capabilities in the littoral.

Anti-Submarine Warfare Overarching Tasks



Sense
A networked suite of fixed, mobile and deployable surveillance capabilities.

Decide
Process, Exploit and Disseminate data to facilitate timely tactical and operational ASW decisions.

Effect
Provide the operational commander with a full range of lethal and non-lethal effectors.

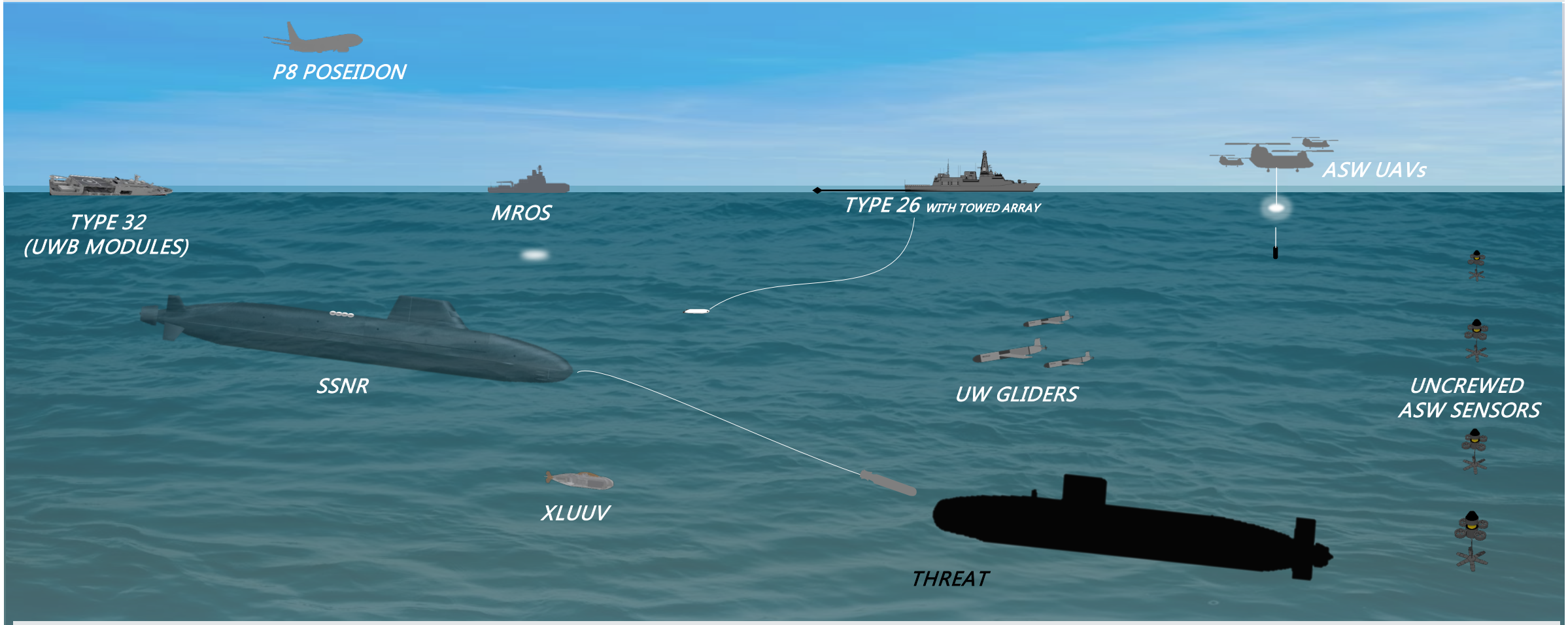
Our historic operational advantage is being eroded and we need to reverse the trend by leveraging technological advances

- **Greater ASW mass** against an increasing number of High End Parity Submarines (HEPS):
  - **Complex Mobile platforms** (crewed) **required for high-end warfighting are expensive** – we need to augment with cheaper 'Deployables' - a portfolio of uncrewed and autonomous airborne/surface/subsurface and static 'nodes' for persistent wide area coverage.
  - Defence has prioritised North Atlantic over expeditionary capabilities – **how to introduce additional sense capabilities for expeditionary MTGs?**
- Interest in **new options for very shallow water ASW**.
- **Rebalancing lethality/survivability** over 'find' and 'fix':
  - Current offensive capabilities heavily reliant on **limited numbers of maritime aviation platforms**.
  - Task Group Lethality relies on a limited number of maritime aviation platforms, or SSNs – **do we need a quick-response, all-weather, Force-wide, stand-off ASW weapon for T26**?
  - Modern torpedoes and novel fusing methods need **new countermeasures**.

ASW CONCEPT FOR 2040

SENSE: A SYSTEM OF SYSTEMS APPROACH - capabilities grouped into 3 categories: Fixed, Mobile, and Deployable.

FIXED – [Redacted] Above classification of this brief.



MOBILE – crewed ASW platforms incl. high-end warfighting platforms (e.g. SSNs, FFTA, MPA).

DEPLOYABLES – a portfolio of uncrewed and autonomous airborne, surface and sub-surface nodes.

TECHNOLOGY TRENDS FOR DEPLOYABLES

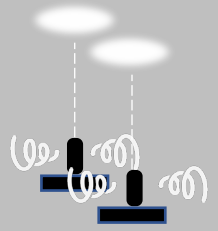
- **Trends:**
  - Uncrewed systems, 'Deployables', provide a remotely-operated or autonomous capability to conduct dull, dangerous, enduring and deep-water ASW missions.
  - As we develop/operationalise these capabilities, they will provide an increasing ability to respond to operating conditions, sensor cues and mission updates.
  - Increasing application of AI/ML techniques will assist human operators or autonomous systems process large volume of data.
  - Uncrewed systems could be employed to conduct long range, and possibly even, armed UxV missions.

- **Challenges:**
  - Energy management, environmental policy constraints, and sustainability.
  - Architecture to retrieve, store, and process data in real time. Archived data stored either onboard a platform or onshore (requiring secure wideband multi domain communication technologies).
  - Covert communications enabling secure data transfer at an extended range (provision of reliable, high data rate, long range through water communications is one of the greatest challenges).
  - Advances in autonomous countermeasures (adversary exploitation of our vehicles), including kinetic measures, will need to be addressed within secure-by-design.
  - Costs and complexity in this area are high and the personnel and organisational structures of MOD will need to evolve to support new operating models.
  - Current regulatory constraints will need to be overcome to operate autonomous systems globally.

ASW DEPLOYABLES

ANCHORED:

individual or interconnected nodes placed in permanent or semi permanent locations.

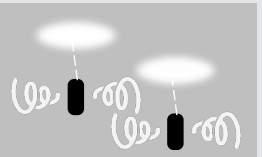


Considerations:

- C2 - secure comms air/water?
- Persistence - power generation/harvesting?
- Survivability - deployment covert/overt?
- Survivability - ease of detection/signature?
- Survivability - security of node and stored data?

DRIFTING:

individual or interconnected nodes designed to be recoverable and reusable.



Considerations:

- C2 - secure comms air/water?
- Persistence - greater than S'Buoy endurance?
- Persistence - recoverable to refurbish and re-use?
- Survivability - security of node and stored data?
- Survivability - ease of detection/signature?

PROPELLED:

individual assets or squads of capabilities working in concert, hosted or self-deployable.

Considerations:

- C2 - secure comms/level of autonomy? Edge processing or remote operations?
- Persistence - ease of deployment (covert/overt)? High endurance vs MTG pace of operations?
- Persistence - ease of recovery, hosted?
- Survivability - ease of detection/signature?

Persistent, deployable, reusable, uncrewed capability to detect, classify, localise and report underwater threat contacts in support of Theatre ASW or Maritime Task Groups.

ANTI SUBMARINE WARFARE PATHWAY TO SUCCESS

The UWB is **the last stealth military domain,** remains an area of UK excellence

Heavy investment by our peer competitors is **eroding the historic advantage** we've enjoyed and could see it reversed

Our headmark is to be **the foremost Navy in Europe by 2030**

To protect our strategic interests we must **restore our historic operational advantage** by **leveraging technological advances** to **increase our ASW force mass** and **enhance our lethality**.

Exploit Autonomy

A wise pivot to a disaggregated force; UxVs offer the opportunity to augment to increase Mass. Opportunities are pursued to fast track programmes with a view to establishing core capability as part of IR25

Return to Warfighting

A system-of-systems approach to maximise mass is required to achieve persistent ASW surveillance of the UW Battlespace. Fixed, Mobile and Deployable systems are need to provide real time data to inform operational decisions, along with lethal and non-lethal effectors to provide finish options for a range of threats.

Working with Allies

Build upon the strong relationships with our closest strategic allies to ensure interchangeability and future technology developments are maximised.

QUESTIONS

Directed Questions:

- What are the current blockers to large scale exploitation of Maritime Uncrewed Systems (MUS) by Defence?
  - Funding
  - Regulations
  - Enablers
- What can Defence do to accelerate the operational exploitation of MUS?
  - ASW Spearhead Project CHARYBDIS (slow start owing to contractual/commercial activities)
  - Additional Deployable ‘challenge’ (2 year funded project/competition)… still tbc
  - UWB Autonomy Working Group (set up to cohere Autonomy activities in the UWB Space:
    - Setting User Standards (front and back seats)
    - Standardising taxonomy
    - Scenario Setting
  - NATO ASW SDI…. David?
- What can Industry do to increase the operational maturity MUS?
  - Realism – caution in discussions with Seniors (expectation management)
  - Focus on Sensor coverage and not on the ‘truck’… enablers being a strong second!
  - No ‘Golden Bullet’, the future is a blend of capabilities…

Open Questions?