



Defence Nuclear
Organisation



[dstl]



Strategic
Command

UNDERWATER DOMINANCE

MAINTAINING OUR ADVANTAGE IN THE UNDERWATER BATTLESPACE

COMBINED NAVAL EVENT
2023

CONCEPTUAL FOUNDATIONS

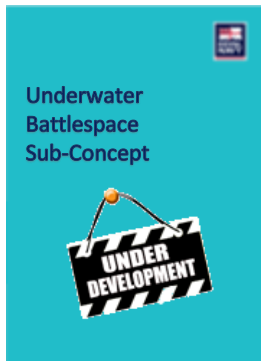


Defence's Integrated Operating Concept

- Sets out the continuum between 'operate' and 'warfight': Protect-Engage-Constrain-Warfight
- Our Armed Forces must be more flexible in delivering a range of tasks.
- Defence will be information led, investing in capabilities that enable us to obtain and exploit information at speed to provide advantage over our potential adversaries.
- The pace of technological change requires us to experiment and take risks to preserve our strategic advantage.

Maritime Operating Concept

- Maritime Force as 'Contingency in Use': configured for global engagement, crisis response, and warfighting.
- 3 defining themes: Becoming a 'Distributed Protean Force', Executing the 'Wise Pivot', and Adopting a System of Systems approach.
- 4 Force Level Outputs: Operational Advantage in the North Atlantic, Persistent Engagement, Carrier Strike, and Littoral Strike.



Underwater Battlespace Sub-Concept (Target: 2* Circ Jun 23)

- Unique challenges and pan-Defence nature of the UWB.
- Design principles, sub-domains, central ideas and intended 'wise pivots'.
- Draws heavily upon our Atlantis 2040 vision.

THE UWB FUTURE VISION



UWB Vision and Capability Roadmap

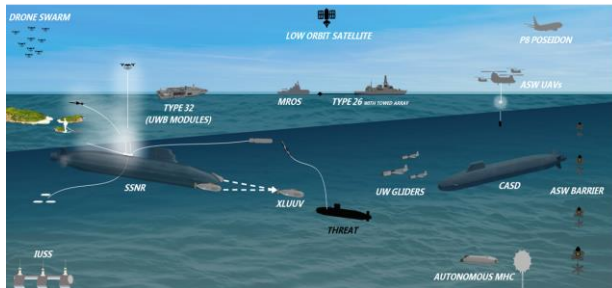
- Developed to support the RN's Integrated Review submission. Endorsed by Secretary of State.
- Articulates the threat, challenges, and opportunities in the UWB – setting out our vision for 2040.

Capability drivers

- **Threat:** [Redacted at OFFICIAL].
- **Technology:** Autonomy, AI / ML, and Quantum potentially biggest 'game changers'.

Key challenges – We must...

- Improve our ASW detection capabilities and force 'mass'. Uncrewed systems could augment high-end crewed platforms to increase persistence or 'force multiply' existing crewed platforms.
- Improve our weapons to defeat countermeasures and low-end threats. Invest in next generation, extended-range self- and area-ASW lethality.
- Improve our ability to protect our UW critical national infrastructure and develop expeditionary Sea-Bed Warfare options.



Conclusions

- We must exploit technology more quickly, especially autonomy & AI.
- Vertical Payload Tubes in SSN-AUKUS enable a modular approach and align with US Navy's SSN(X).
- We must work with our closest UW allies to accelerate the pace of capability development and 'interchangeability'.

UK CONTRIBUTION TO UWB IS A PAN-DEFENCE ENDEAVOUR

CASD



Anti-Submarine Warfare



Seabed Warfare



Ministry of Defence



Defence Nuclear Organisation



Strategic Command

Geo-Intelligence



Submarine Delivery Agency

At direction of VCDS, DCDS(MILCAP)'s 2* UWB CMG coheres capability planning in this complex domain



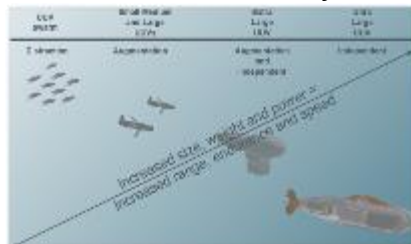
MCM & Maritime EOD



UK Hydrographic Office



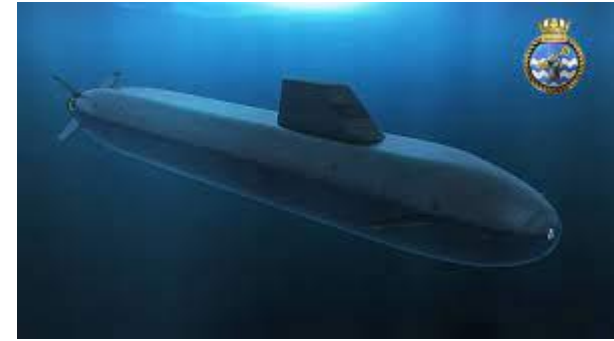
UW Autonomy



Acoustic Data PED



UWB CAPABILITY PRIORITIES: CASD



- Operation RELENTLESS is the UK's highest priority and longest sustained military operation, now in its 54th year and underpinned by the 1958 MDA and 1963 PSA.
- Current priorities:
 - Vanguard to Dreadnought transition is the RN's highest capability/procurement priority <1450 days.
 - Sustainment of Vanguard Class capabilities ahead of V->D transition.
 - Improved availability across the submarine force (A-Class Improvement and Sustainment Programmes).

UWB CAPABILITY PRIORITIES: GEOINT AND MCM

Geo-Intelligence tasks:

- Deep water survey (CASD)
- Global Military Data Gathering
- UK inshore & Antarctic survey
- Environmental prediction (AW & UW)



Current priority is to enact our FMDG vision:

- Replace HMS SCOTT via MROS programme
- Disinvest in SVHO platforms and achieve outcomes via a 'System of Systems Approach'

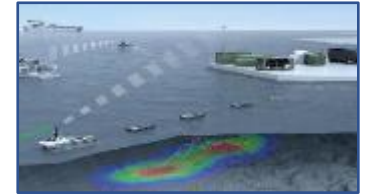
Future Military Data Gathering concept:

- Benign bathymetry (Commercial delivery)
- Persistent Oceanography (floats/gliders)
- Contested MDG (HM Mission Teams)
- Reactive MDG (HM-MT augmentation)



Mine Countermeasures & EOD tasks:

- Mine Clearance
- Diving and life support
- Maritime EOD



Current priorities:

- MCMV to MHC transition
- Diver Life Support
- Future Maritime EOD
- RD&E project (TRITON)



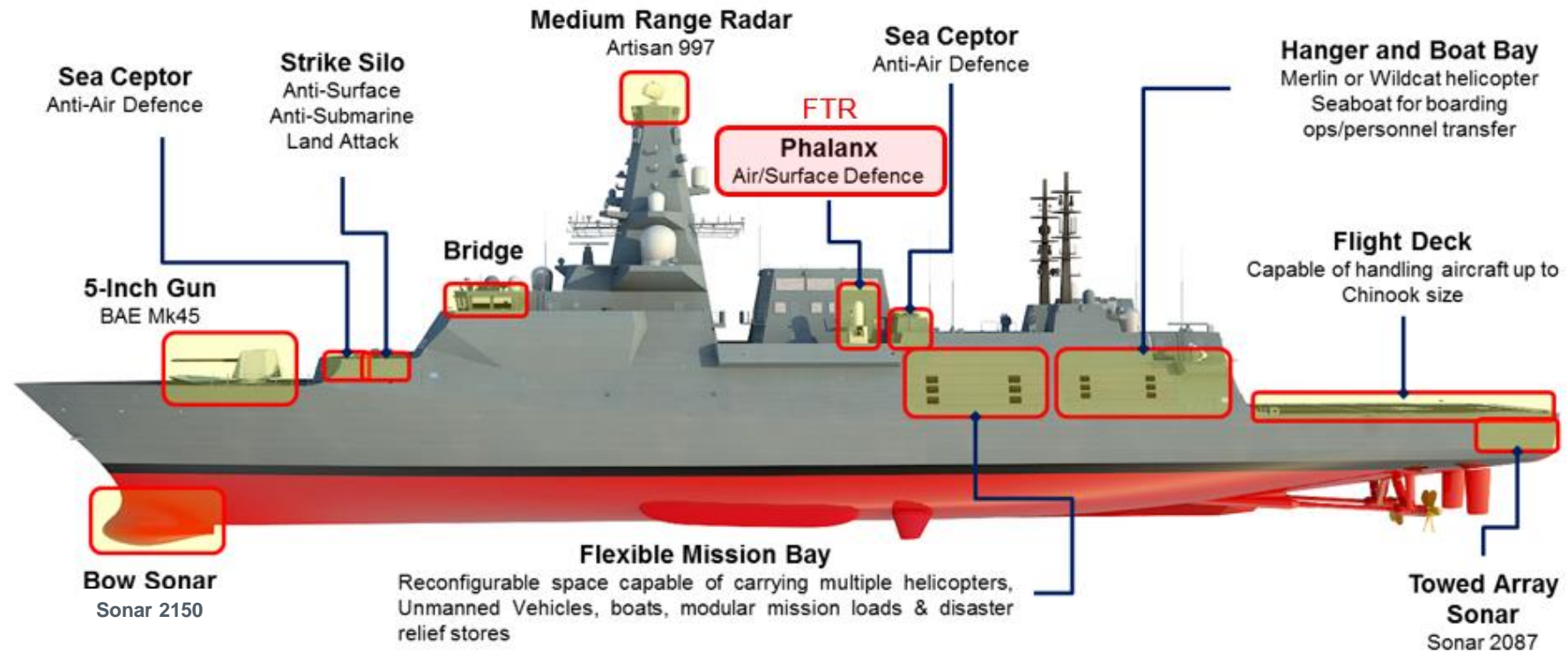
UWB CAPABILITY PRIORITIES: ANTI-SUBMARINE WARFARE

Our historic operational advantage is being challenged. 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’:
 - 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.**



Type 26 Frigate Capability Overview



← Length 149.9 metres, beam 20.75 metres and 7,000 tonnes displacement →

Personnel

161 core crew complement
Total accommodation for 208

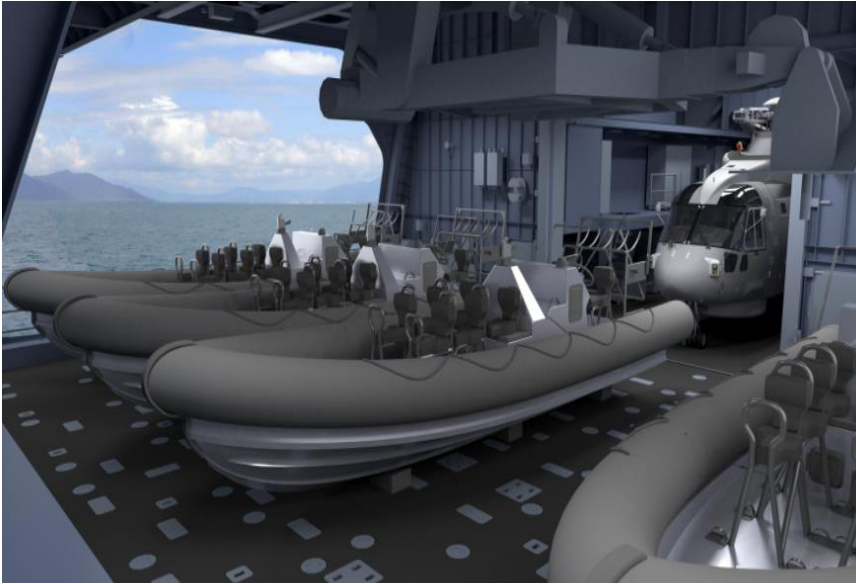
Propulsion

1 x MT-30 Gas Turbine
4 x Diesel Generators

Anti-Submarine Warfare

Builds upon the pedigree of the Type 23 Frigates
Acoustically quiet hull

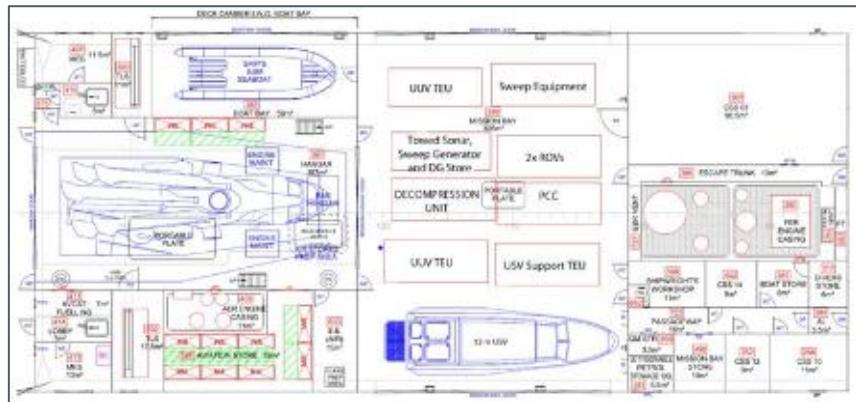
T26 Mission Bay



- Mission bay capacity (based on securing arrangements)
 - 10 TEUs (20ft)
 - 5 FEUs (40ft) – loaded via flight deck
 - 4 Bicon (10ft)
 - 2 Tricon (6.5ft)
 - 4 Quadcon (5ft)
 - max 150 tonne total (18 tonne single via flight deck)
 - Twistlock connections shock qualified to 15 tonne load

- Mission bay services:
 - LP Air – 8bar
 - HP Air – 300bar
 - Fresh water
 - Black and Grey Water
 - 440/230/115 VAC
 - Fire/Flood/Smoke Detection
 - Dieso supply and drain point (Note no Civgas)
 - GPS Repeater for UAV, USV, UUV, boats, etc.
 - Architecture for UXV integration with CMS
 - Secret Network Infrastructure
 - Link plates also fitted for securing helos

- The T26 Programme will deliver, via HMNB DEVONPORT infrastructure team, a Mission Module Mounting area.
 - To be available in advance of Phase 2 Sea Trials.
 - 440/230/115 VAC supplies.



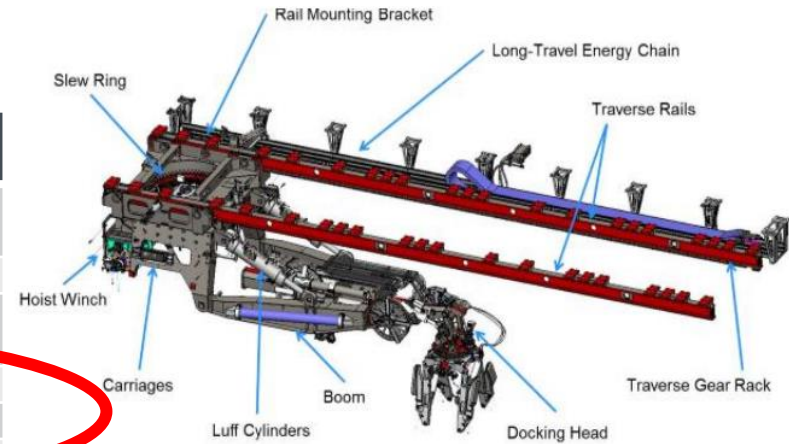
Illustrative MCM MAS in MB

T26 Mission Bay Handling System

Mode	Payload Allowable Weight (tonnes)	Maximum Sea State
Cargo in harbour and sheltered waters	16.5	2
Cargo at sea	1	6
Munitions in harbour and sheltered waters	5	2
Unmanned vehicles (UXV)	10	6
Manned surface craft	10	6
Manned submersible craft	9	4

Note: The cargo in harbour and sheltered waters capability of 16.5 tonnes includes the lifting appliance which weighs 1.5 tonnes. TEU has a maximum allowable weight of 15 tonnes.

- Capable of reconfiguring MB in 24 hours using onboard facilities and delivered equipment
- Capable of embarkation of MM from Base Port:
 - Mass of 15 tonnes
 - Outreach 16m from centreline
 - TEU require CofG within 0.5m of middle of container
 - TEU handled with container spreader, smaller units with lifting slings



UWB CAPABILITY PRIORITIES: SEABED WARFARE

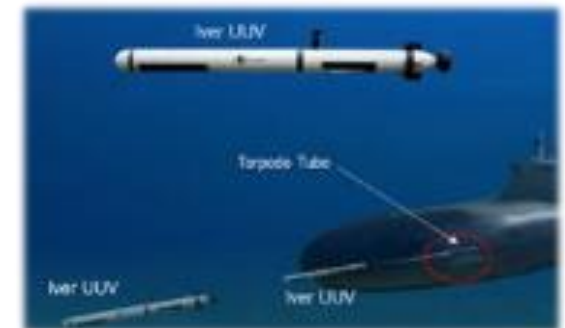
- A new area of capability sponsorship assigned to RN as 'Lead User'
- Synergies with existing ASW, GeoInt and MCM / EOD requirement sets.
- AUKUS workstream to develop concepts and initial capabilities together.



- Our Seabed Warfare Capability Roadmap endorsed.
- Protect UW CNI: Baseline survey, Investigate, Neutralise/Recover.
- Expeditionary tasks: survey adversary CNI, hold at risk, monitor areas of interest.
- Advocates a 'System of Systems Approach' across delivery platforms and systems.

Current priorities:

- Establish on a Programmatic basis under Navy leadership.
- Develop supporting concepts / doctrine (CONEMP)
- Establish the supporting programme, prioritising PROTECT:
 - MROS Seabed Warfare (RFA PROTEUS) & tranche 1 COTS systems
 - SM-launched UUV op demonstrator (& core programme)
- Work with our closest allies to accelerate progress (AUKUS)



UWB CAPABILITY PRIORITIES: UW AUTONOMY & ACOUSTIC PED

UWB Uncrewed and Autonomy

- Major growth area across all UWB sub-domains
- Uncrewed systems underpin our current pivots in FMDG and MHC programmes

Current priorities:

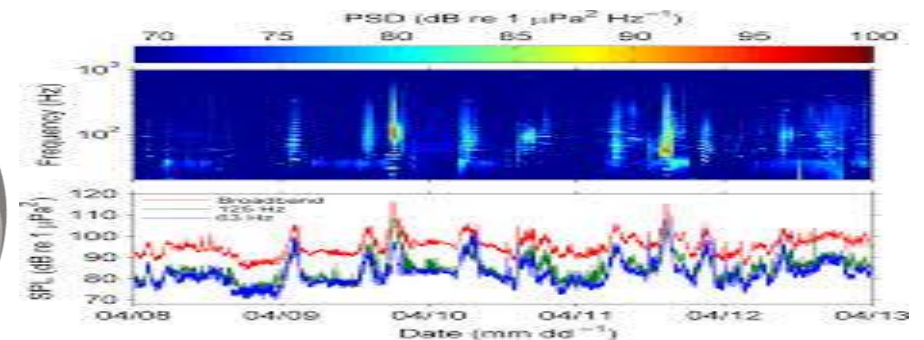
- SM-launched UUVs (Torpedo Tube Launch & Recovery)
- XLUUV experimentation – Project CETUS
- ASW ‘Deployables’

UWB Acoustic Data PED

- Lack of historic sponsorship ‘post-collect’
- Pan-defence problem with P-8A
- Navy assumed lead user role in Sep 22

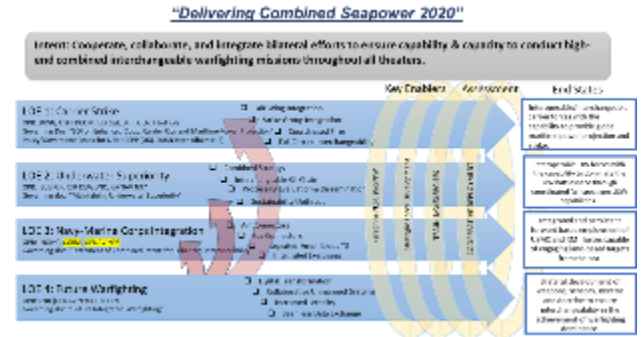
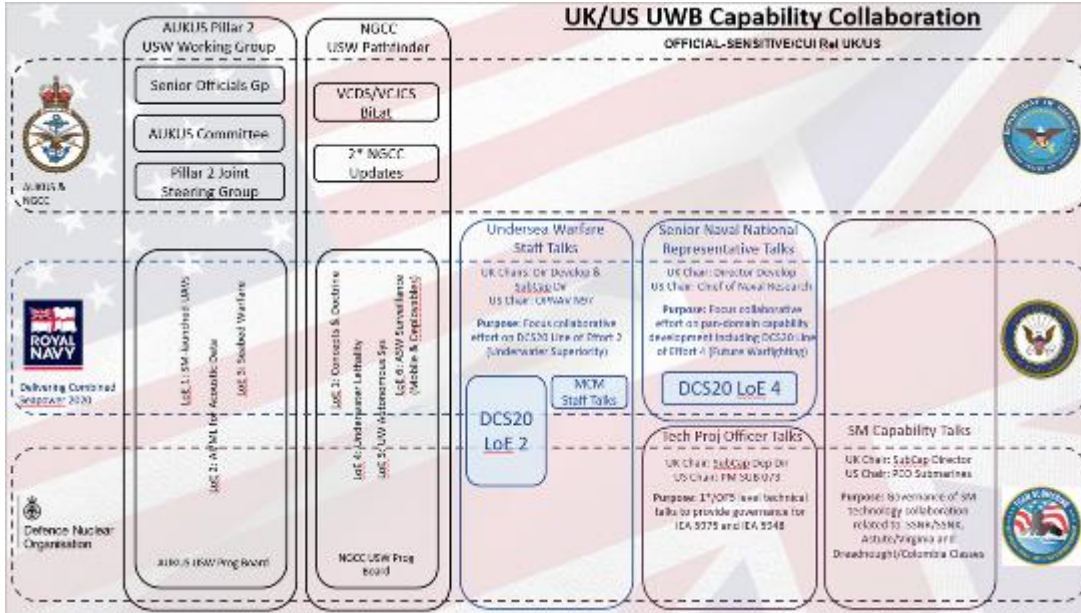
Current priorities:

- Sponsorship of Acoustic Analysis Centre
- Codification of data standards for acoustic data
- Increased automation of processing via AI / ML
- Addressing obsolescence / data storage



US/UK COLLABORATION: AMBITIOUS AND FAR REACHING

- Extensive nuclear and conventional UWB capability collaboration across multiple frameworks.
- Using USN-RN 'Delivering Combined Seapower' framework as 'controlling mind' for UWB capability workstreams.



AUKUS Trilat priority workstreams:

- Pillar 1: SSN collaboration & interim capability.
- Pillar 2: USW Working Group Lines of Effort:
 - SM-launched UUVs.
 - AI/ML for Acoustic Data.
 - Seabed Warfare.

UK/US Bilat priority workstreams (for UK):

- UW Lethality Summit - (now incl. AUS).
- Wide Area ASW Surveillance.
- USW Decision Support System.
- Submarine technologies in support of SSN-AUKUS / SSNX.

QUESTIONS & DISCUSSION