



The Navy: Purpose and Procurement

Introduction

At BAE Systems, we provide some of the world's most advanced, technology-led defence, aerospace and security solutions. Our UK-based maritime and land business employs a skilled workforce of nearly 20,000 with tens of thousands more working with us across the supply chain. Based across 12 major sites, with a presence elsewhere across the UK and internationally, we work with customers and partners to design and manufacture naval ships and submarines as well as their state of the art combat systems and equipment. We offer an array of associated services, including training solutions, maintenance and modernisation programmes to support ships and equipment in service around the globe. We are also a leader in the design, build and support of munitions to the UK and armed forces worldwide.

This submission is in response to Part 2 of the Defence Committee's inquiry, focussed on naval procurement and support plans.

1. Carrier Enabled Power Projection

Concerns have been raised over some core equipment and enabling capabilities for the carrier strike program: the withdrawal and removal of partners from the F-35 program has led to speculation that the UK will cut its order; the Public Accounts Committee reported in November that the Crowsnest radar system had been delayed by 18 months because of poor contractor performance and inadequate departmental oversight; and the tendering process for the Fleet Solid Support Ships (FSS) has been delayed multiple times with the current Solid Support Ships expected to retire between 2023-2025. How will this affect plans for Carrier Enabled Power Projection?

As the UK Carrier Strike Group (CSG21) deploys to the Indo-Pacific, thousands of our employees and thousands more in our supply chain will be looking back with great pride on two decades of work contributing to this milestone.

Working with the Aircraft Carrier Alliance, our role includes a leading role in the design, build and support of HMS Queen Elizabeth; and also her escorts, the Type 23s, Type 45s, and an Astute Class submarine. We also design and integrate their combat systems, and our naval association extends to the USA where our ship repair business recently completed a maintenance period on USS The Sullivans.

We also have a key role in F-35 design, production and sustainment, including the aft fuselage and electronic warfare systems of every aircraft. We welcome the RAF's commitment to grow the fleet, and we will continue to work with Lockheed Martin to maximise the UK's industrial participation in the programme, which today supports over 2,000 jobs.

Our teams in HMNB Portsmouth and RAF Marham have been helping the Royal Navy and RAF integrate and prepare for CSG21, and a small number of our employees have been deployed to provide ongoing support. CSG21 will demonstrate the capabilities of NATO's first 5th generation carrier strike group on the journey to full operating capability for Carrier Enabled Power Projection (CEPP).

We understand that the Fleet Solid Support Ship (FSS) is a critical element of CEPP, and we have been working with our partners in Team UK since the project was first launched three years ago. We are developing a concept design which we believe can meet the MOD's requirements. We will

maximise social value and prosperity with design, engineering and production work undertaken in regions across the UK, and by incorporating a diverse UK supply chain, including SMEs.

To ensure coherency and interoperability across the Carrier Strike Group and other NATO assets, our concept includes combat systems and data links that are already in-service with the Royal Navy.

To deliver the first of class and meet the stated timescales for CEPP, the procurement will need to progress and reach a conclusion soon. The transition arrangements between existing and future afloat support capabilities remains a responsibility for the Royal Navy.

2. Submarine Enterprise

Delays to the Astute class submarine program have been a longstanding area of concern, with the late hand over of HMS Audacious likely to have extended delays further down the tranche. How will these delays affect the replacement timeline for the Trafalgar class and the cost of the program?

What impact will delays to Astute have on the Dreadnought program, as some of the same production facilities are required for both models?

The design, build and integration of nuclear powered submarines is one of the world's most complex engineering challenges, and our skilled teams are driving continuous improvement across the Astute and Dreadnought programmes.

Despite the global pandemic, and in the middle of the UK's first national lockdown, we were able to deliver Audacious, the fourth Astute class submarine, to the Royal Navy to begin sea trials. The submarine incorporates a number of design changes, meaning it is significantly different to the first three boats. Emergent technical challenges did postpone the departure as reported, but we do not expect any further impact on the schedule for subsequent boats.

Anson, the fifth Astute class submarine was officially named in December 2020 and launched in April 2021, representing a major milestone in the build cycle. Sea trials are scheduled for next year, and the two remaining submarines in the class – Agamemnon and Agincourt – are in an advanced state of construction.

Following the Astute programme, the Dreadnought class will be the Royal Navy's biggest, most powerful and most technically advanced submarines. Their combat systems will incorporate computing architectures capable of rapidly introducing new software and data exploitation. They will begin to enter service from the early 2030s, and will play a pivotal role in the nation's defence and security.

We remain committed to delivering the first Dreadnought submarine to the agreed schedule. Having cut steel in 2016, the construction of Boat 1 is now well advanced, and construction of the second submarine, Valiant, is also underway. We work transparently with the Dreadnought Alliance and the Submarine Delivery Agency to integrate schedules, focussed on the imperative of sustaining Continuous At Sea Deterrence (CASD).

Over £1 billion has been invested in redeveloping the Barrow site which will increase productivity with advanced manufacturing technology, transformed digital infrastructure, process improvements, and enhanced quality and safety. This is a long-term investment, also baking-in our target to achieve net zero greenhouse gas emissions across our operations by 2030.

A recent report into the economic impact of Dreadnought revealed the submarine programme will support almost 30,000 UK jobs at its peak, and we expect to spend in the region of £7.5 billion with 1,500 suppliers in England, Scotland, Wales and Northern Ireland.

3. Type 45

The time at sea for the Type 45 destroyers has been limited in previous years due to long-term difficulties with cooling, propulsion and manpower. What is the status of efforts to address this, like the Power Improvement Program, and what impact will the Type 45's readiness levels have on Navy capabilities over this period?

The Type 45 air defence destroyers will provide CSG21 with cutting-edge capabilities to simultaneously detect, track and electronically report hundreds of targets at long range, whilst deterring and defeating threats using the Sea Viper missile system or electronic counter-measures.

The challenges of bringing the class into service were investigated in the Independent Power and Propulsion System Performance Review in 2011, and we have worked collaboratively with DE&S and the Royal Navy to subsequently improve readiness levels.

Through the Power Improvement Programme (PIP) we are working with Cammell Laird to systematically enhance the architecture of the power and propulsion system; increasing electrical generation through additional, more powerful diesel generators and upgrading the distribution systems. Work started on HMS Dauntless in spring 2020 and the current programme anticipates sea trials beginning later this year.

There are a number of other industrial arrangements through which we are supporting the Royal Navy to increase Type 45 availability:

- Class Output Management (COM): through which we provide asset management, design services, repair and maintenance, and capability upgrades. This is transitioning to a new contract under the Future Maritime Support Programme which aims to improve the availability of the Portsmouth flotilla.
- Equipment Improvement Programme (EIP): through which we are delivering a series of projects to improve the reliability of existing equipment on the Type 45s. A large proportion of these improvements have been embodied with demonstrable increases in equipment availability. This work continues.
- Joint Support Solution 2: under this programme we ensure the availability of warship combat systems across the Royal Navy fleet, including Type 45. Through frequent software updates or upgrading computing infrastructure during planned refits, we are rolling out developments boosted by complementary work on the Type 26 programme.

The Royal Navy has other arrangements in place to support certain items of equipment, and we understand steps are being taken to improve the provision of spares to complement the efforts outlined above.

4. Frigates

The UK is likely to face a “frigate gap” until at least the early 2030s. The current Type 23 frigates will begin to leave service on an annual basis from 2023. There are concerns over the extended retirement dates, especially with regards to the integrity of certain hulls and lack of spare part packages across the board. The first replacement Type 26s and Type 31s are not expected to be in service until at least four years later. What capabilities will the Navy lose or need to deliver through other means as a result? How realistic are production plans for the Type 31s (already described as “aggressive” and including an ambitious delivery rate of one every 8-12 months, compared to 18 months for comparable European programmes for similar vessels)?

Working with our partners across the UK we are participating in the programme to upgrade the Anti-Submarine Warfare (ASW) capability of the Type 23s, and to increase the commonality of the combat system with Type 26. This includes introducing Shared Infrastructure, private cloud computing, and a testing environment to develop new capabilities such as autonomous systems. This will de-risk the transition from Type 23 to Type 26, as the first ship enters service in the mid-2020s and the Royal Navy then operates a mixed fleet into the 2030s.

The Royal Navy will determine the out-of-service timetable for the Type 23s, and the schedule for bringing the Type 31 Inspiration class into service.

5. Autonomy

The Navy's Hunt and Sandown Mine Counter Measure Vessels will be replaced by an Autonomous Mine Hunting Capability currently under development. How likely is this to be able to replicate the vessels' full contribution, including to partnerships with allies through deployments like Op KIPION, by the time they reach retirement in the early 2030s and what are the implications if it does not?

What other progress is being made on integrating UAVs into the Navy?

The transition of Mine Counter Measures (MCM) to an Autonomous Mine Hunting Capability is an exciting development and shows innovative leadership in an area ready for the introduction of uncrewed systems. The containerised nature of the capability means it can be exploited from non-MCM specific platforms, demonstrating the versatility of autonomous systems. Testing this capability from the River Class Offshore Patrol Vessels and Bay Class LSDA will prepare the Royal Navy to exploit the Type 26 Mission Bay.

As the Royal Navy expands the experimentation and integration of autonomy, we are supporting projects such as NavyX where, for example, we are continuing with our previously well-publicised work involving our Pacific-24 sea boat. We are also working with Dstl on other innovative solutions for uncrewed sea boats, and with the Royal Navy to develop equipment agnostic computing architectures that maximise open standards and flexibility in order to integrate with new assets.

We recognise the Royal Navy's ambition to work towards large scale autonomy, and we will continue to conduct research and development in this direction. This is an area where we believe an acquisition process that maximises agility, pace, and new ways of working, including a practical approach to testing and certification, will help accelerate progress.

6. National Shipbuilding Strategy

Is the UK's domestic shipbuilding industry able to fulfil its role in delivering the country's naval capabilities? What has been the effect of the National Shipbuilding Strategy? Does the government's decision in the Defence Industrial Strategy to determine whether to invite foreign competition on a case-by-case basis (rather than just for warships) increase or decrease the opportunities for UK shipbuilding? What will industry need to see in the government's forthcoming update to the National Shipbuilding Strategy and 30-year plan for Naval and other government-owned vessels?

The refresh of the National Shipbuilding Strategy is an opportunity to bring to life the vision outlined in the Defence Command Paper and the Defence & Security Industrial Strategy (DSIS) for a vibrant and globally competitive shipbuilding sector in the UK, maximising our contribution to post-COVID-19 economic recovery.

The Naval Procurement Policy confirms that the UK needs to maintain the industrial capability to design, manufacture and integrate naval ships, and to do so requires a more nuanced approach to acquisition, reflecting the unusual nature of the market. For complex warships, this industrial capability has been consolidated on the Clyde, and a continuous programme of work is required to exercise and evolve these skills.

We welcome the Government's intention to expand the 30-year plan in the NSBS to include naval and other government-owned vessels, and stress that this should be linked to an acquisition strategy that provides stability and transparency, creating the conditions to attract investment in R&D, facilities and skills. These are long-term investments and take many years to implement and to deliver benefits.

Complex systems integration skills are critical to shipbuilding and the ability to support and upgrade warships in-service. The NSBS should incorporate systems integration and extend to the wider supply chain where the UK has a competitive advantage. This touches on many other capability segments identified in DSIS, such as systems integration, C4, sensors and detection, data exploitation, autonomy and novel weapons, where certain skills must be maintained to provide the Royal Navy with

operational independence and to protect sensitive technology, including for example, in the underwater battlespace. The UK also has key supply chain capabilities in areas such as power and propulsion.

The NSBS should also recognise that to design world-class warships that are competitive in the export market, the whole of the UK's capabilities and skills need to be engaged in the design. This has been proven by the Type 26, where the warship and many of the systems it incorporates were developed in the UK, and this is now recognised as the most advanced ASW frigate in the world, clearly underpinned by export success.

We will continue to engage with Government on the NSBS, including through dialogue with the MOD, participation in the Maritime Enterprise Working Group, and through our membership of the Society of Maritime Industries.

7. Exports

How realistic are proposed exports of Type 26 and Type 31 frigate designs and what effect would they have on costs of the frigates for the UK? Since most foreign buyers will seek to produce ships domestically, how much value are these export deals likely to deliver to UK shipbuilding?

The Type 26 is a symbol of Global Britain and export success in Australia and Canada should be a source of national pride. This returns a range of benefits to the nation beyond export revenue, including sustaining design skills, extending production lines in the supply chain, strengthening defence and trade relationships, increasing interoperability with allies, and creating opportunities to collaborate on training and sustainment. We are pursuing economies of scale in the supply chain and also through efficiencies in through-life support, should the UK, Australia and Canada be persuaded to develop a common approach.

We are still tracking some opportunities to produce warships in the UK for export, and this remains feasible as long as we have current designs and an active production line with capacity. However, we expect the primary route to market to be design services and technology transfer, demonstrating the importance of UK-owned intellectual property. It is possible to then take a role in local build, as we have done with ASC Shipbuilding in Adelaide. This also creates opportunities for our UK-based supply chain to export equipment and grow their presence in the export destination.

In both circumstances, warship exports are long-term partnerships which need substantial support from across Government and the Royal Navy, which remains a reference customer for other navies around the world. This support was a key feature of the success in Australia and Canada.

8. Type 32 and Type 83

The government's Defence Industrial Strategy promises up to five Type 32 frigates and a new class Type 83 destroyer but no further details on these ships' designs and roles have been provided: how can the government learn from previous programs in designing and delivering these two ships?

The Type 32 and Type 83 programmes are opportunities to enliven the three priorities of sovereignty, security and prosperity, as expressed in the Integrated Review.

We encourage the Royal Navy to engage industry as early as possible to help explore concepts and options that incorporate the latest technology, maximise the impact these future platforms can have in a more diversified and integrated operational environment, and work towards a net zero fleet. This process can be outcome and capability focussed, not requirements led. We can also help develop opportunities to demonstrate technology intended for Type 32 and Type 83 on the existing fleet.

Following on from the military capability, the importance of these programmes to sustain warship design and systems integration skills in the UK must be at the heart of the procurement strategy. Stable and transparent leadership will help such a process run effectively.

For complex, high-end warships in a first-of-class programme, our experience is that a single organisation that integrates the designer and the shipbuilder is key to minimising interfaces, maintaining a digital thread from design through to production, and being present at the shipyard for joint working and issue resolution. Risk, schedule and cost certainty should also be matured before moving to more rigid commercial arrangements, which should still retain the ability to manage change. We also strongly believe that collaborative working, no matter the contracting structure, is crucial to the success of major projects.

As outlined in the DSIS, a more agile acquisition process, left-shifting decisions, and considering exportability at the start of the planning lifecycle sets a welcome context for these programmes.