



Ministry
of Defence

The United Kingdom's
Future Nuclear Deterrent:
The 2018 Update
to Parliament

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Introduction

The United Kingdom's (UK's) nuclear deterrent deters against the most extreme threats to the nation's way of life, both now and in the future. It provides the ultimate guarantee of national security, and is a major part of this Government's commitment to ensure the safety and security of its citizens. In 2016, Parliament voted overwhelmingly in favour of retaining the UK's nuclear deterrent and replacing the current Vanguard Class submarines with four new ballistic missile submarines: the Dreadnought Class. Working with industry partners, the Department will ensure that the UK has a credible, independent and capable nuclear deterrent out to the 2060s and beyond.

Since the 2017 update, the National Audit Office conducted a landscape review of the Defence Nuclear Enterprise to help Parliament better understand the portfolio of programmes. The report provided a factual account that set out the complex nature of the Enterprise and recognised the positive steps the Department has taken to deliver its technically challenging network of programmes and to help ensure that there are sufficient investments, structures, processes and skills available to sustain the nuclear deterrent, now and in the future.

This is the seventh annual update on the replacement submarine programme and other related programmes across the Enterprise.

Progress on the Dreadnought Programme

Overview

The programme remains within budget and on track for the *First of Class*, HMS Dreadnought, to enter service in the early 2030s. Work continues at pace with good progress on the whole boat design and with the transition into construction. The programme entered Delivery Phase 2 in April under the management of the new Dreadnought Alliance (see *Management and Governance Changes* below).

The Department underpinned this second phase with initial tranches of over £1.3 billion of investment with two of the programme's Tier 1 suppliers: BAE Systems and Rolls-Royce. Investment during this three-year phase of work will see the continuation of the manufacture of the first submarine, and commencement of the build of the second (Valiant), and the manufacture of Dreadnought's nuclear propulsion power plant. The investment will also support the building of facilities at BAE Systems' shipyard in Barrow-in-Furness and the next generation of facilities at Rolls-Royce's Raynesway site in Derby. The major sub-contract commitments planned under this Phase include gearboxes, main engines and generators, with 'batch-buy' being pursued where appropriate to maximise value for money opportunities across the four-boat programme. Construction of the main pressure hull units for Dreadnought are progressing well, and utilisation of the new Central Yard Facility in the Barrow shipyard is now ramping up.

There will always be uncertainty associated with delivering one of the most complex programmes ever undertaken by the UK. To provide increased insight and confidence, the Dreadnought Alliance has matured the integrated schedule that gives a coherent view of the holistic build programme and is used to drive it forward, based on “every day counts” and making “best for programme decisions”. Over the next six months (and progressively after that) the Alliance will analyse in greater detail the programme risks, and identify opportunities to increase flexibility in the schedule and reduce programme costs.

In May, the Defence Secretary opened the new £100 million Central Yard Facility. The facility provides additional capacity and enables a more efficient build methodology, for example to outfit and test each section of the submarines. The benefits of other investments at the Barrow shipyard are also being seen, such as the Paint Facility and development of the New Assembly Shop.

As reported in the media in October, there have been technical complications with the manufacturing of the missile tubes to be used in the Common Missile Compartment being developed for our submarines and the United States' Columbia Class. Assessment and repair work is underway with the main supplier and their subcontractors, and we are working closely with our US counterparts to understand and, where possible, enable their plan to achieve the earliest supply of missile tubes into the Dreadnought programme. The Ministry of Defence (MOD) will not compromise on its high standards on safety and quality; this issue will see no change to the programmes' overall budget and timescales.

Dreadnought Costs

The 2015 Strategic Defence and Security Review estimated that the programme is likely to cost a total of £31 billion (including inflation over the lifetime of the programme), and set a contingency of £10 billion. In Summer 2017, the Department completed a baseline review of the submarine portfolio that confirmed the programme remains within its estimated cost. Following this Review, MOD was given access to up to £600 million in Financial Year 2018/19 from the contingency to enable opportunities to be taken to drive out cost and risk later in the programme and protect our nuclear deterrent. To date £5.5 billion has been spent so far on the concept, assessment, and early delivery phases - £1.2 billion of which was spent in Financial Year 2017/18.

Wider Programmes

Overview

The National Audit Office reported the expected total spend on supporting the Enterprise as £50.9 billion between 2018 and 2028. The wider portfolio of programmes that underpin this includes the design, production, maintenance and operation of submarines and nuclear warheads, and providing the estate and people to support capabilities. The 2017 baseline review consisted of a bottom-up cost exercise that used common assumptions for the costing of risk and uncertainty, and reviewed the confidence levels for programmes. As a result, there is a more appropriate provision for risk and uncertainty in the costing of the biggest programmes.

Infrastructure

The Department is committed to addressing the challenges presented by the infrastructure that supports the Enterprise, including sites owned and operated by industry partners. A review of the roles and responsibilities of infrastructure delivery and through-life management resulted in organisational and budget authority changes that will improve the definition, development and delivery of the facilities needed.

Whilst these changes bed-in, many infrastructure projects continue across the Enterprise. The most significant of which are at: BAE Systems' Barrow site where the work to deliver the Dreadnought enabling facilities is progressing well; the Rolls-Royce's Raynesway site where the construction of new core manufacturing facilities that will support the Dreadnought Programme remains on track; Babcock Marine's Devonport Royal Dockyard for defueling of attack submarines; and at Her Majesty's Naval Base Clyde in support of submarine operations. There are also projects underway at the Atomic Weapons Establishment's sites as part of the Warhead Programme.

In France, infrastructure to support the TEUTATES Treaty continues. The UK Explosives Storage was formally opened in September at the French Atomic Energy Commission's Epure facility at Valduc. Construction of the UK Office Block will be complete before the end of the year and the UK Eyes Only facility for the assembly of UK hydrodynamic experiments will go operational in the first half of 2019.

Warhead and Missile

Transition of the warhead to Mark 4A is ongoing, addressing obsolescence from the Mark 4 to ensure the UK continues to have a safe, secure and available stockpile. Work also progresses to refine options and technical solutions to inform the Government's decision on replacing the warhead. This includes compatibility with the Trident strategic weapon system where MOD is closely engaging with counterparts in the United States to understand their plans, following their 2018 Nuclear Posture Review.

Investment at the Atomic Weapons Establishment continues under the Nuclear Warhead Capability Sustainment Programme to deliver the necessary capabilities, infrastructure and skills to support the warhead programme. This includes projects to reduce the technical, cost and schedule risks once a decision on a future replacement warhead is made.

Following approval in 2017, work continues to extend the planned life of the Trident II D5 missile electronic packages to minimise the risk of obsolescence. The UK is also participating in other US led through-life capability programmes. These life extension programmes provide sufficient Trident II D5 missile packages, including spares, to support the UK's current stock entitlement.

Supply Chain

The Department is working closely with its Tier 1 suppliers to manage the extended supply chain, improve its health and evolve it towards the requirements of the future. The Submarine Delivery Agency has established a new Supply Chain Team responsible for the analysis of the supplier base and the strategy to support the complex and highly specialist supply chain, taking forward initiatives that deliver improvement.

Skills

Following the Government's 2017 Industrial Strategy Green Paper, the Nuclear Sector Deal was published in June to build on the historical partnership between Government and industry that has helped the UK become one of the leading nuclear countries in the world. The Deal sets out a vision up to 2030 with a range of proposals and ambitious goals - successful delivery will be achieved through work to strengthen collaboration and leadership from industry. The Department is actively engaged in the Nuclear Skills Strategy Group, which leads the 'people' strand of the Deal. The Group published its revised strategic plan on 6 December, aligning its approach against the Deal's key commitments: Enhanced Skills Leadership; Staying at the Cutting Edge; and, Exciting the Next Generation about Nuclear. Additionally, it includes an increased emphasis on the Defence Nuclear Sector and how the Civil and Defence sectors can collaborate. This will lead to a highly skilled and diverse workforce that will support Defence Nuclear Programmes into the future.

Today, the Department and industry partners continue to support and deliver sustained investment in skills and the associated infrastructure. On the 6 December, the Defence Secretary formally opened BAE Systems' new Submarine Academy for Skills and Knowledge at its Barrow site. The Academy, which caters for around 2,500 employees and apprentices a month (including MOD personnel), comprises bespoke workshops; a virtual reality suite; replica to-scale submarine units; and, training rooms. Apprentices, dependent on their level of experience and how much training they have received, will work on various tasks relating to submarine programmes.

Submarine Decommissioning

Within the submarine portfolio, there is a programme of work to manage and to dispose of the 20 decommissioned submarines, and to provide arrangements for future submarine decommissioning. The key elements of planning for submarine decommissioning are:

- Management of Laid Up Submarines. All decommissioned submarines continue to be inspected and maintained to the required safety, environmental and security standards to ensure that they remain safely afloat. MOD has commenced long-term planning for managing the Vanguard and Astute Class submarines on completion of their operational lives.
- Submarine Defueling. MOD has five Swiftsure and seven Trafalgar Class submarines to be defueled at Babcock Marine's Devonport Royal Dockyard. A plan is being developed to complete the final phase of work to generate the facility for defueling. The plan is expected to be finalised and financially approved in 2019 - it will determine when the facility will be available for defueling operations.
- Submarine Dismantling and Disposal. MOD continues to develop its solution for safe, secure, cost-effective and environmentally sound submarine dismantling. The technical solution for 'Stage One' dismantling has been developed and deployed, resulting in the removal of over 70 tonnes of low level radioactive and non-radioactive waste from the demonstrator submarine, Swiftsure. Dismantling of the second submarine, Resolution, will commence in 2019. The dismantling project's strategic focus and planning over the next two years is to establish the 'Stage Two' technical solution and to demonstrate full dismantling and submarine recycling by 2023 to inform the optimum solution for a steady-state submarine dismantling and disposal programme.

International Relationships

The UK will be leaving the European Union, but the UK will not be reducing its commitment to European security or turning its back on Europe, or the rest of the world. The continued commitment to NATO is a clear demonstration of this.

The Department is working closely with international and cross-Government colleagues to keep abreast of changes in the political landscape regarding the UK's future international trade, which in turn will help ensure nuclear interests are addressed. For those elements of the supply chain that are based in the European Union, the Department is continuing to work with the Cabinet Office, Department for Exiting the European Union and others to ensure that the implications for the defence sector are considered in the future UK-EU partnership. The political declaration between the UK and the EU sets out an ambitious vision for a future partnership that includes a new free trade area that facilitates trade through a new customs arrangement, deep regulatory cooperation, and avoids any tariffs or quotas with a view to facilitating the ease of legitimate trade.

2018 marked the 60th anniversary of the Mutual Defence Agreement; collaboration with the US remains strong through cooperation on nuclear weapon and reactor technologies. This includes research on warhead safety, security, and advanced manufacturing technologies taking place under the UK-US Joint Technology Demonstrator project. Cooperation with France under the TEUTATES Treaty is progressing. This will deliver a hydrodynamic capability to conduct experiments ensuring our nuclear weapons remain safe and effective. We also continue work with international partners to reduce the threat from nuclear terrorism and on research to support arms control and verification.

Management and Governance Changes

The Department continues to deliver on its commitment to strengthen the management of all nuclear programmes. In April, the Defence Nuclear Organisation was formally established as a Top Level Budget of MOD, with Julian Kelly as Director General Nuclear. Over 2018, the organisation has established its capability to support the Director General in his role as the sponsor for the Enterprise. The organisation manages the portfolio of nuclear programmes, including acting as the Departmental Sponsor for the Submarine Delivery Agency, advises on UK nuclear policy and planning, and on international cooperation on nuclear matters. It engages in scientific research, delivery of nuclear warheads, procurement of submarines, provision of specialised infrastructure, and disposal, as well as sustaining specialist skills, conducting assurance and maintaining emergency response arrangements.

In April, the Submarine Delivery Agency became a new Executive Agency of the Department established solely for the procurement, in-service support and disposal of submarines. Led by its Chief Executive, Ian Booth, and Chair, Rob Holden, the Agency operates alongside the Defence Equipment and Support (DE&S) organisation to deliver capabilities to the Royal Navy that are essential for the Defence of the UK and its allies.

The Agency has made good progress filling senior positions. Two Government Non-Executive Directors (NEDs) have been appointed to the SDA Board: Sir Simon Bollom, Chief Executive of DE&S and Mark Russell, Chief Executive of UK Government Investments. Three Non-Government NEDs have also been appointed: Anne Baldock, Annette Hobhouse and Jonathan Simcock. A fourth appointment is expected imminently, subject to completion of the employment process. The Agency's Executive Team has been strengthened with appointments of a Chief Financial Officer, and directors to lead the

Commercial and Corporate Operations functions of the organisation. Recruiting within the Agency remains a key priority that will be driven forward by a project to improve the recruitment and deployment of core staff.

Also in April, the Department established the Dreadnought Alliance: a joint management team between the Submarine Delivery Agency, BAE Systems and Rolls-Royce. The Alliance delivers on the commitment to intensify efforts with industry partners to improve performance and put in place new industrial and commercial arrangements between government and industry.

The Alliance reports to, and receives its delegations from, the Submarine Delivery Agency. It is responsible for delivery and integration of the full four-boat programme, including: the design, build, test and commissioning activity to Programmed Acceptance Dates. Governance is provided through an Alliance Leadership Board, which is led by an Independent Chair and made up of a representative from each of the three parties. On 1 September, Sir Peter Gershon was appointed the Independent Chair of the Alliance.

The Department also established a Defence Nuclear Security Regulator to provide assurance that the measures in place to safeguard Defence nuclear assets are adequate. This reflects recognised good practice, both internationally and within the UK civil sector, that the security of nuclear assets should be assured through robust independent processes. The Regulator achieved mature operating capability this year and is now conducting routine inspections and assessments of physical, personnel, information and cyber security arrangements, in order to provide further confidence that the Enterprise's key materiel is secure.

Next report

The Department plans to next report progress to Parliament in late 2019.