



Defence  
Nuclear Enterprise

# **Delivering the UK's Nuclear Deterrent as a National Endeavour**





# Delivering the UK's Nuclear Deterrent as a National Endeavour

Presented to Parliament  
by the Secretary of State for Defence  
by Command of His Majesty

March 2024



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# Foreword from the Prime Minister

The first duty of the state is to protect its people, territory, economy and interests from internal and external threats. Our nuclear deterrent has been

the cornerstone of our national security, safeguarding our values and way of life, for more than 70 years. It has protected the UK and our NATO allies from the most extreme acts of aggression and nuclear blackmail from our adversaries.

Our deterrent is more relevant now than ever before. We face new and diverse challenges from nuclear-armed states that make deterrence as critical today as it was in the last century.

As Prime Minister, I am acutely aware of the responsibilities that come with being a nuclear weapons state. The UK remains a champion of the Treaty on the Non-Proliferation of Nuclear Weapons and is committed to fulfilling our obligations. We continue to work to build trust and create an environment for further progress on disarmament.

In 2023, a year into Russia's illegal invasion of Ukraine, the UK's refresh of its Integrated Review (IR2023) described an increasingly contested and volatile world. It anticipated a deteriorating security environment, driven primarily by a growing convergence of authoritarian states intent on challenging the basic conditions for an open, stable and peaceful international order. This assessment has only been validated by the events of the past year.

Against this uncertain global security outlook, the foundational component of an integrated approach to deterrence and defence remains a credible, independent UK nuclear deterrent, declared to the defence of NATO. It ensures that potential adversaries can never use their capabilities to threaten the UK or our NATO

allies or to deter us from acting in support of regional and global security and stability. We would consider using our nuclear weapons only in extreme circumstances of self-defence, including the defence of our NATO allies, but the knowledge that we can and would use them is the core tenet of deterrence.

Against this backdrop, the purpose of this command paper is to set out how we will deliver the programmes necessary to strengthen our nuclear deterrent.

This includes an invigorated approach to delivering our submarine and warhead programmes but also to the people and communities that support our deterrent.

This is the platform from which this government is launching a national endeavour to recapitalise the Defence Nuclear Enterprise, the partnership of organisations that operate, maintain, renew and sustain the UK's nuclear deterrent. It is a call to action across government, industry and society. We should be confident in articulating the importance of our nuclear deterrent, not only to our national security, but also in the many other benefits it brings, including economic ones.

We must inspire our current workforce, their families and our prospective workforces for the generations to come: the submariners; apprentices; graduates; project managers; engineers; and the communities that support our nuclear deterrent across the country.

This document sets out the full scale of that activity. It outlines our investments in the Defence Nuclear Enterprise and our partnerships with the communities, businesses and international allies that underpin the deterrent and protect our way of life.

We have already announced an additional £3 billion across the Defence Nuclear Enterprise at the 2023 Integrated Review

Refresh. This will support new facilities with advanced manufacturing capabilities in Barrow-in-Furness and Derby. As the home of nuclear submarine building in the UK we are also investing in Barrow-in-Furness, to make it an attractive place to live and work in order to sustain our submarine programmes with the skilled workforces required for the decades to come.

The investments we are making in the enterprise, and the people and communities we rely upon, will also support the delivery of AUKUS; the trilateral security partnership between Australia, the UK and the US agreed in 2021. We have awarded contracts worth £4 billion for the development of the new conventionally armed, nuclear-powered SSN-AUKUS submarine. The UK based design will be built in Barrow-in-Furness in the 2030s and will also be built and operated by Australia as part of our AUKUS partnership.

These commitments to defence nuclear sit alongside major investments in civil nuclear as set out in the recently published Civil Nuclear Roadmap, our most ambitious civil nuclear strategy in decades. To support our ambitions to generate the numbers of skilled people we need to work in our civil and defence nuclear sectors, a Nuclear Skills Taskforce has been created. It has developed an action plan to double the number of graduates and apprentices while quadrupling the intake of nuclear fission, nuclear fusion and specialised scientific related PhD students over the next four years.

**Renewing the UK's deterrent is a huge undertaking that safeguards our security and enhances our prosperity. One that requires a truly national endeavour.**





## Foreword from the Secretary of State for Defence

Thirty years ago, the very first of our Vanguard nuclear submarines set sail. The crew of that vessel were entering a very different world to the one their forebears had been familiar with at the dawn of the age of Continuous-At-Sea deterrence. The Cold War had ended. The Berlin Wall had come down.

In the days of the iron curtain, the logic and importance of nuclear deterrence was well understood. Yet, as the direct danger from the Soviet Union receded into the past, so did the recognition of the role our nuclear deterrent played in guaranteeing our collective security.

Fast forward to today and we have come full circle. Nuclear risks are rising. Having illegally invaded Ukraine and broken its former commitments, Russia is trying to use reckless nuclear rhetoric to stop others from sending help. China is rapidly increasing its warhead numbers and expanding its range of delivery systems. And now those established nuclear powers are joined by new actors. North Korea is regularly rattling its nuclear sabre. Iran is producing highly enriched uranium without providing proper access to the International Atomic Energy Agency.

We should not shy away from our status as a proud and responsible nuclear power. We must now be more vocal about our nuclear deterrent and those who support it as well as the benefits the nuclear enterprise brings to our society.

First and foremost it provides security. Our Continuous-At-Sea deterrent is the ultimate protection from the gravest of threats to the UK. It also forms a key part of NATO's nuclear umbrella and a vital pillar in the security of our Alliance partners.

Second, our nuclear enterprise is truly a national endeavour providing highly skilled jobs

across the United Kingdom. Our submarines are constructed by BAE Systems in Barrow-in-Furness. Their nuclear reactors are built by Rolls-Royce Submarines Ltd in Derby. Our warheads are designed and manufactured by the AWE in Aldermaston and Burghfield. Together this vast undertaking supports an estimated 42,000 jobs and a supply chain of 3,000 businesses from Devonport to Dounreay. And our world class reputation in nuclear development is helping us bolster our trilateral bonds. Which is why today we are joining forces with the United States and Australia as part of AUKUS to help construct Australia's first nuclear powered, conventionally armed, submarine.

Finally, our nuclear enterprise is about unparalleled opportunity. What other programme can combine the ingenuity of the Apollo missions with the science of the Manhattan project? What other programme can unite disparate specialisms from nuclear physics to project management, from software engineering to welding? We need to do more to strengthen that pipeline of talent, which is why alongside this Command Paper we also launch a new Nuclear Skills Plan to attract the brightest British brains from the civilian and military spheres. The people who join us will not just play a pivotal role in our national security and energy resilience but sustain our skills base, energise our local economies and pave the way for the next generation of nuclear giants.

Thirty years on from their first mission, our Royal Navy submariners are today patrolling the waters of a far more dangerous world. Yet the silent service is silent no longer. With new Dreadnought submarines under construction, a replacement warhead in the works and major programme of modernisation underway, this Command Paper underlines how our nuclear deterrent will continue to guarantee the safety of the UK and its Allies for as long as is necessary.



# The UK's nuclear deterrence policy

The purpose of nuclear deterrence is to preserve peace, prevent coercion and deter aggression. A credible, independent nuclear deterrent remains essential to guarantee our security.

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The view of successive UK governments is that an independent, minimum, credible nuclear deterrent, declared to the defence of NATO, is essential to our security and that of our NATO Allies. It is a critical part of our insurance against the risk and uncertainties of the future.

**The UK maintains a Continuous-At-Sea Deterrent (CASD), delivered by the Royal Navy, since April 1969 under Operation RELENTLESS.** It consists of at least one nuclear-powered submarine on patrol at all times, armed with the Trident missile system and UK sovereign nuclear warheads.

Our Vanguard Class SSBNs (Ship Submersible Ballistic Nuclear), which carry our nuclear weapons, are supported by a range of Royal Navy capabilities including our Astute Class SSNs (Ship Submersible Nuclear). These are conventionally armed, nuclear powered attack submarines that protect CASD as well as being capable of undertaking multiple defence and intelligence tasks.

We are deliberately ambiguous about precisely when, how and at what scale we would use our weapons. Alongside our decision to no longer publicise figures for our operational stockpile or deployed warheads, this posture enhances our deterrent effect by complicating the calculations of potential aggressors, thereby reducing the risk of deliberate nuclear use by those seeking a first-strike advantage.

The credibility of our deterrent is enhanced by ensuring it remains operationally independent. Only the Prime Minister can authorise the use of our nuclear weapons, even if deployed as part of a NATO response.

Potential aggressors know that the costs of attacking the UK, or our NATO allies, would far outweigh any benefit they could hope to achieve. This deters states from using their nuclear weapons against us or carrying out the most extreme threats to our national security.

**The deterrent protects us every hour of every day. By providing a credible and effective response to extreme aggression, our nuclear deterrent reduces the likelihood of such an attack taking place.**

This deters the most extreme threats to our national security and way of life, helping to guarantee our security and that of our NATO allies. It ensures that potential adversaries are dissuaded from using their capabilities to threaten or coerce the UK or our NATO allies, or to deter us from taking the action required to maintain regional and global security and stability.

**We are now in a period of heightened risk and volatility that is likely to last beyond the 2030s.** We are therefore reaffirming our commitment to a credible nuclear deterrent and investing to sustain and renew our capabilities for as long as required, as this document sets out. We will keep our nuclear posture under review in light of the international security environment and the actions of potential adversaries.

**At the same time, we remain committed to the ultimate goal of a world without nuclear weapons and support full implementation of the Treaty on the Non-Proliferation of Nuclear Weapons (NPT).** There is no credible alternative route to disarmament. The UK continues to support the entry into force of the Comprehensive Nuclear-Test-Ban Treaty (CTBT) and will continue to press for key steps towards multilateral disarmament through the NPT.

It is the firm view of this government that a world where the UK's potential adversaries have nuclear weapons and the UK (and NATO) does not, is not a safer world.

**Our security is enhanced by our partnerships with our allies.** We have a strong relationship and engagement with the US. Our standing as a responsible nuclear power remains an important part of our long history of defence cooperation, enhancing Euro-Atlantic security.

The UK works closely with the US on all nuclear matters, including nuclear policy, operations and technology. Our close relationship with France, our European nuclear ally, plays a critical role, including through our collaboration under the Lancaster House Treaties. This includes co-operation under the 2010 TEUTATES Treaty, through which we share research facilities and co-operate on technology. The UK and France are increasing co-operation on nuclear deterrence issues.

The UK is also committed to building understanding and expertise on nuclear issues in NATO. This includes ensuring coherence between the Alliance's nuclear and conventional policies and developing the capabilities needed for the future.



# **Introduction: A National Endeavour**

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# Delivering the UK Nuclear Deterrent: A National Endeavour

Day in, day out, right across the country and beyond, thousands of people in the public sector, military and industry are working together to achieve our shared mission: to deliver capabilities, deter the threat and protect the nation.

To sustain the deterrent for as long as it is needed, we are making the following commitments:

- we are investing £31 billion (with a £10 billion contingency) in the new **Dreadnought Class SSBNs** with the first boat due on patrol in the early 2030s;
- we are developing a **replacement UK sovereign warhead**, while maintaining our existing stockpile;
- we are recapitalising critical elements of our **infrastructure** to modernise our naval bases and manufacturing processes, supporting growth as we anticipate future fleet needs and weapons requirements;
- we are nearing completion of the UK's fleet of conventionally armed, nuclear powered **Astute Class SSNs** and have begun designing the **next generation of attack submarine, SSN-AUKUS**;
- we are enabling industry to plan for the future by working with the Department for Energy Security and Net Zero (DESNZ) to coordinate our defence activity with investment in the **civil nuclear sector**, itself critical to our energy security;
- we are enhancing nuclear power generation over the long term by investing in **nuclear technology**, with many parallels to the investments needed to support the UK's Energy Security Plan;
- we are working with industry partners to **safeguard our supply chains for the future**; and

- we are investing in **Barrow-in-Furness** as the home of nuclear submarine building in the UK, in recognition of its criticality to the nation's security.

**These are some of the largest and most complex programmes ever seen.** They require unique cutting-edge technology and world-leading expertise in science, engineering and manufacturing.

**In order to deliver all of this:**

- we continue to have a **close partnership with our most important ally, the US**, facilitated by the longstanding 1963 Polaris Sales Agreement and the 1958 Mutual Defense Agreement for broader cooperation and exchange;
- we continue our important **relationship with France**, our European nuclear ally, cooperating on technology and nuclear deterrence challenges. This includes our collaboration under the 2010 TEUTATES Treaty, through which we share research facilities;
- we are **strengthening our partnerships with industry**, particularly our prime suppliers Babcock International, BAE Systems and Rolls-Royce Submarines Ltd, with a focus on delivery to schedule;

- we have brought **AWE**, which designs, manufactures and ensures the safety and efficacy of our warheads, back into the Ministry of Defence as a wholly owned arm's length body and have acquired **Sheffield Forgemasters**, who provide specialised steel, into public ownership, enabling closer alignment with our requirements;
- together with DESNZ, we launched the **Nuclear Skills Taskforce (NSTF)** to work with industry, academia and the education sector to increase the numbers of apprentices, graduates, and PhDs across the sector – this will ensure we can access the right skills for nuclear, providing new economic opportunities for thousands of people across the country;
- we will maintain the **scientific and engineering expertise** that ensures UK defence nuclear programmes fully comply with our international obligations and develop our ability to counter nuclear proliferation, prevent nuclear terrorism, identify and deter nuclear test explosions and verify future arms control regimes; and

- we will enable industry to plan for the future by working with DESNZ to coordinate our defence activity with investment in the **civil nuclear sector**, critical to our energy security.

**Alongside investment in civil nuclear for our energy security needs, this breadth of activity amounts to a new era for the nuclear sector in the UK.**

**All these measures represent a significant undertaking and investment by the UK government and industry, with an enduring commitment for the decades ahead.** This will generate economic opportunity across our UK supply chain, including submarine construction at BAE Systems in Barrow-in-Furness, submarine maintenance at the Babcock International site in Devonport, nuclear reactor development at Rolls-Royce Submarines Ltd in Derby and warhead design and manufacture at AWE in Berkshire.

## **This Command Paper sets out, for the first time, what it takes to deliver the nuclear deterrent.**

It reaffirms our commitment to maintaining global stability, working with our allies including NATO, and reminds potential adversaries that we are ready to prevent coercion and deter aggression.

It represents a commitment to enhance our industrial base, working in closer partnership with academia and business, and a promise that we will maximise economic opportunity and invest in our communities.

It is also a call to action to everyone who contributes to safeguarding the security and prosperity of our nation by supporting the nuclear deterrent.

**This is the work of the Defence Nuclear Enterprise.  
This is our national endeavour.**



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## **The Defence Nuclear Enterprise (DNE) is the partnership of organisations that operate, maintain, renew and sustain the UK's nuclear deterrent.**

**The nuclear deterrent is the Ministry of Defence's number one priority.**

In order to deliver our mission in the years ahead, the DNE is making several changes:

- we are strengthening its leadership, now headed by the newly appointed civilian Chief of Defence Nuclear and the First Sea Lord of the Royal Navy, enhancing coherence, senior focus and accountability;
- we are bringing together its core elements to work more closely than ever before: the Defence Nuclear Organisation (DNO), the Royal Navy, the Submarine Delivery Agency and AWE;
- we are operating a new ring-fenced budget and greater delegated spending authority, as well as more streamlined, robust governance;
- we are working with our industry and training partners to develop the skilled workforce that we will depend on in the coming years.

## **The scale of our endeavour**

**Delivering our mission is a complex and geographically widespread undertaking, covering all aspects of maintenance, development and delivery.**

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The UK government is investing in infrastructure and construction projects to develop new, or update existing, facilities that support our nuclear programmes.

The footprint of the DNE and our three prime contractors spans all regions of England, Scotland and Wales and supports a supply chain of over 3,000 small, medium and large businesses.

The DNE provides considerable economic benefit at a local and national level. The enterprise has a current workforce demand of around 42,000 jobs.

To match the scale of our endeavour, our skilled workforce will also grow.

This growth, alongside our multi-decade pipeline of programmes, re-emphasises the UK's standing as a global leader in advanced submarine manufacture.

## Enterprise site locations



## AUKUS: The trilateral security and defence partnership between Australia, the UK and the US

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The AUKUS partnership is one of the most strategically important capability collaborations in decades. For all three countries, it will help meet our shared commitment to supporting stability and security through a free and open Indo-Pacific by progressing towards more unified defence and industrial collaboration, better information and technology sharing, and greater resilience, helping develop joint capabilities.

Pillar One of the partnership will see the UK and US assist Australia by developing a conventionally armed, nuclear powered submarine capability. The culmination of this will be a new SSN-AUKUS Class, based on the world-leading UK design currently under development.

Pillar Two of AUKUS is accelerating the development and delivery of advanced conventional (non-nuclear) capabilities. It includes regulatory and legislative measures to ease the export and transfer of technology and expands ways of sharing sensitive information. This will enable better integration of security and defence related science and technology, allowing AUKUS states to develop cutting-edge capabilities at the pace and scale of relevance, bolstering our respective industrial bases and supply chains.



Artist impression of SSN-AUKUS

**Through the development of SSN-AUKUS and our trilateral advanced capabilities portfolio, AUKUS is supporting a free and open Indo-Pacific, as well as driving technological progress and improving interoperability with two of our closest partners.**

The partnership will enhance the UK's ability to operate in the Indo-Pacific. Future exercises will improve each nation's ability to work together and test the joint operation of advanced capabilities, radically improving a shared ability to tackle emerging threats. This sits alongside the UK and US establishing a rotational presence of SSNs in Australia to develop at-sea experience for Australian crews.

The government has allocated an initial £4 billion to BAE Systems, Rolls-Royce Submarines Ltd and Babcock International for the design phase and procurement of long-lead items for the UK's fleet. Australia has also committed to make a significant investment into the UK's submarine industrial base. BAE Systems, working with Australia's ASC Pty Ltd, will build Australia's SSN-AUKUS fleet. At its peak, over 21,000 people in the UK will be working on the SSN-AUKUS programme.

The AUKUS partnership allows Australia to draw on over 60 years of British expertise in the design, build, and operation of nuclear submarines as they develop their own capabilities.

All three AUKUS partners are committed to meeting their respective nuclear non-proliferation obligations.



# Part One: Our people

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**Our advantage over our potential adversaries depends upon the ingenuity and dedication of our people. They are our most important asset.**

**The UK will significantly expand its nuclear workforce to meet the growing demand of the DNE and our future civil energy requirements. This will deliver economic opportunities and growth at nuclear locations across the country.**

Driven by its involvement in cutting-edge scientific advancements, the UK has a growing demand for nuclear skills in both defence and civilian sectors. We need deep nuclear subject matter expertise, such as in science and engineering, with specialists in fuels, materials, warhead design and reactor physics.

The DNE is also highly dependent on many trades, such as welders, electricians, mechanical fitters, warhead component manufacturers and assemblers, who complement the thousands of employees in specialist functions such as project management, legal and commercial.



## Our submariners

**Submariners are some of the Royal Navy's most exceptional personnel; responsible for highly classified, stealthy and elite operational and deterrent patrols that play a critical role in protecting and defending the UK globally.**

Roles within the Submarine Service are varied and diverse. Each is essential to sustaining our competitive edge as a world-class naval force. Roles range from engineers, who maintain and operate the naval reactor plant and weapons systems, to those that command and operate the boat, to those focused on logistics, medical and catering. These roles are complemented by the security capability provided by the Royal Marines.

All submariners complete either a level two or level three apprenticeship, undertaking specialist training in both submarine and nuclear-specific technologies alongside general engineering academia. The Royal Navy ranked third in the UK's top 100 apprentice employers in 2023, demonstrating the quality of the academic provision and opportunities for its people.

Further in-service qualifications are also on offer up to Master's level, alongside professional accreditation in a wide range of fields. These career opportunities will only continue to grow with the accelerating progress of the DNE and the AUKUS partnership.

Submariners continue to develop their technical, leadership and command skills while deployed globally, operating leading-edge submarine technology. Their responsibilities include everything from keeping mechanical systems in operating condition under the Arctic ice, conducting deployed maintenance periods in a Mediterranean port or deploying globally as part of a Carrier Strike Group, delivering defence engagement on behalf of the UK government and being prepared to deliver support through humanitarian aid.

Within eight years of joining the Royal Navy, submariners could be leading their own onboard engineering section, running a watch in the operations room, working alongside industry partners to support development and introduction to service of new technologies, or training the next generation of submariners.

Many submariners work with industry, government and academic partners in non-operational roles, providing experience and subject matter expertise in roles ranging from nuclear engineering to programme management, reflecting the breadth of the expertise that can be developed in the Royal Navy.

The Royal Navy is a central member of the NSTF. In addition to increasing the graduate and apprenticeship intake across the service, the Royal Navy will improve retention by increasing access to sector-wide interchange opportunities, allowing personnel to expand and develop their skills by moving across, and within, the nuclear community.

By establishing a framework for staff interchange across the nuclear sector, submariners will have the opportunity for zig-zag careers, underpinned by agreement with industry partners.

We have invested significantly to support developing our submarine force, alongside initiatives in industry, providing state-of-the-art facilities and the most up-to-date and realistic simulators, modern workspaces and world-leading training courses, to allow all future submariners to work and train in the same location and benefit from the same facilities.

**These opportunities for in-work learning and development offer our people the chance to upskill, opening up possibilities to further their careers in nuclear.**



# The Nuclear Skills Taskforce (NSTF)

In August 2023, the Ministry of Defence and the Department for Energy Security and Net Zero established the NSTF. This brought together government, employers and academia from across civil and defence nuclear to develop the national nuclear strategic plan for skills. This sets out the activity that will help supply the sector with talent for an estimated 40,000 additional jobs by 2030.

The Ministry of Defence and DESNZ are working with industry to implement a range of initiatives and measures to support national security and the demand for energy resilience.

### To attract and retain nuclear skills:

- we have launched the first ever national nuclear communications campaign, 'Destination Nuclear', to attract and retain the skilled personnel needed for the sector. The campaign promotes opportunities across both civil and defence. The first phase of the campaign is focused on attracting mid-career and lateral entrants, with strong transferable skills, to fill current vacancies; and
- we have developed a single sector portal for recruitment to make it easier for people to see the varied opportunities that we have, and to apply for jobs, marking the first time organisations across the nuclear sector have worked together to make roles visible in one place.

### To grow the pipeline:

- we are investing to increase our intake of nuclear sector graduates to around 2,000 in the next four years and targeting the creation of more than 5,000 apprentices over the same period. This incorporates actions already underway at BAE Systems and Rolls-Royce Submarines Ltd, who are already doubling their apprentices; and

- we will create opportunities in the North West with the Nuclear Decommissioning Authority alongside BAE Systems, and in the South West where Babcock and EDF will be doubling their apprentice numbers and bringing even more new starters.

### To deepen expertise:

- to ensure the UK remains a world leader in nuclear, we will quadruple nuclear physics PhDs to over 130 a year and are aiming to introduce over 400 additional specialised scientific and nuclear related PhD students over four years and establish up to three new Centres for Doctoral Training (CDTs).





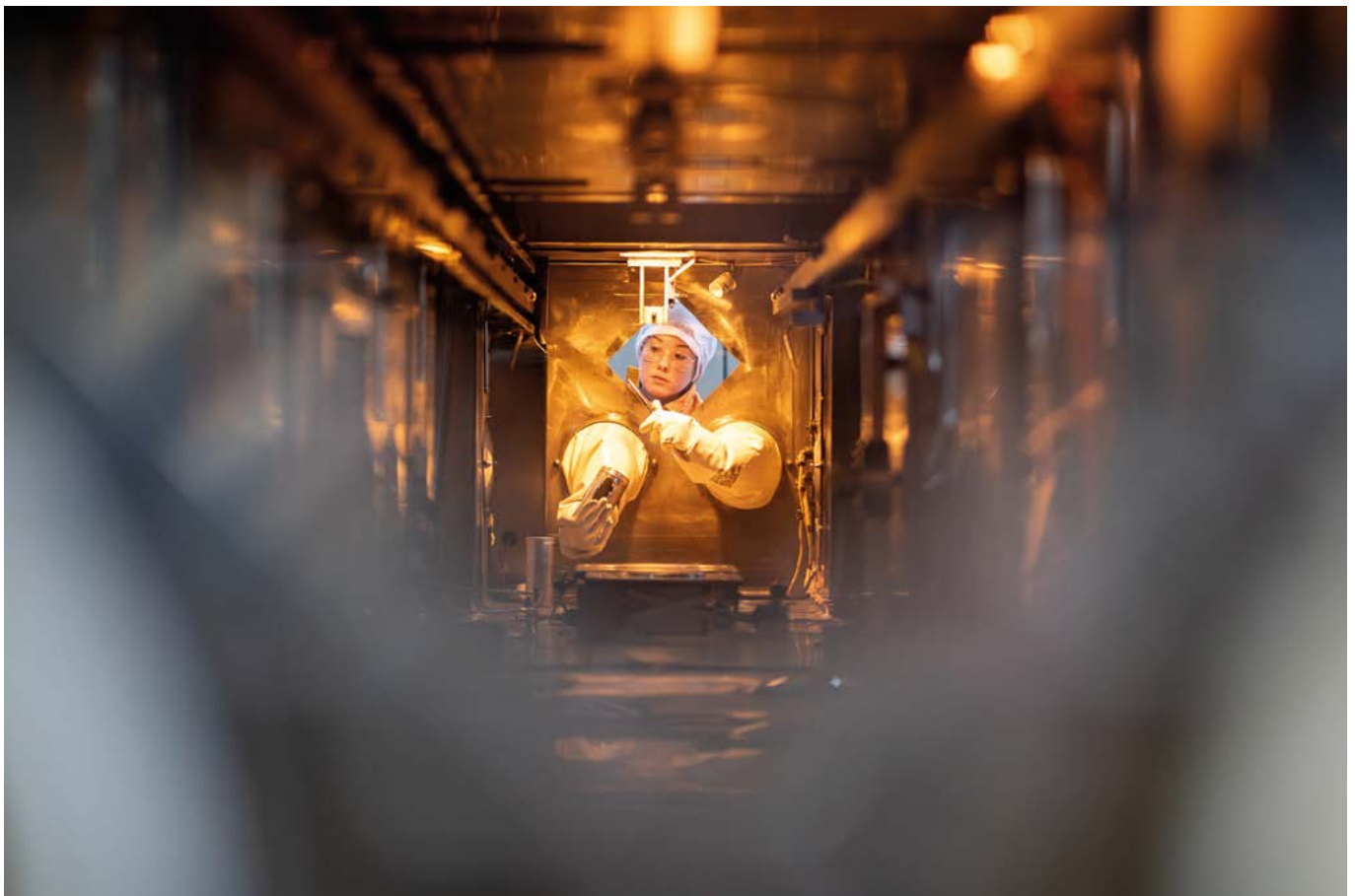
**To support flexible, long-term careers in nuclear:**

- we will standardise curriculums and qualifications across the sector, enabling people to transfer between organisations. We will also establish cross sector development and leadership programmes and create a sector experts programme that will retain workers in teaching and training roles; and
- we will establish regional hubs to strengthen collaboration in critical hot spots, working together to address the specific needs of the area in which they operate. We have two pilots underway in the North West and the South West.

**To strengthen co-operation and co-ordination:**

- the UK Nuclear Skills Charter, endorsed by government, industry organisations and academic institutions, will set out the commitments and behaviours that underpin this plan.

**The plan for skills will enable the DNE and civil nuclear sector to grow a workforce that is motivated, recognised and inspired – doubling our current recruitment performance and delivering the UK's priorities for national security and energy resilience.**



# Barrow-in-Furness

With its long history of shipbuilding dating back to the 1800s, Barrow-in-Furness remains a location of critical national importance to this day. BAE Systems' Barrow shipyard is the only facility in the UK with the infrastructure, site licence, and resources to design and build the UK's nuclear submarines.

In recognition of the vital importance Barrow plays within the DNE, the UK government has established a trilateral partnership between central government, Westmorland and Furness Council and BAE Systems. This partnership, which will enable the significant expansion required to continue supporting the Defence Nuclear Enterprise, has already begun to deliver for Barrow-in-Furness:

- It is supporting work on Barrow's local plan to guide further development, as well as **providing up to £24 million through the Brownfield, Infrastructure and Land Fund to unlock over 800 new homes at Barrow Waterfront.**
- It is working to improve the local skills ecosystem through the **creation of a Barrow-specific Education, Employment and Skills Taskforce**; convening a Transport Group; and increasing Job Centre Plus activities to improve join-up between employment and health and to expand youth unemployment support.
- We are providing **a new Barrow Transformation Fund; a ten-year funding settlement of at least £20 million per year** that will be delivered in collaboration with our local partners. The endowment-style fund will give long term certainty to deliver projects over multiple years and the flexibility to invest in interventions based on evolving local needs and priorities.
- The Barrow Transformation Fund will support local priorities such as improving health and wellbeing; increasing productivity; restoring Barrow's heritage and unlocking its visitor economy; and building more homes and improving transport links. It will provide the stable and sustained investment needed to level up the town and deliver its unique role in the protection of our national security.
- **A new Barrow Delivery Board, backed by an additional £5 million government funding**, will play a role in administering the Transformation Fund, ensuring decisions on Barrow's needs are taken locally and by the right group of dedicated experts. The Delivery Board will also conduct strategic masterplanning, supporting development of thousands of new high-quality homes and regenerating the town centre.

**Collectively, these interventions will make it possible for Barrow to grow sustainably – strengthening the local economy by encouraging more people to come to live and work in the area.**

# Academia

**To ensure the DNE remains at the forefront of emerging technology, we supplement in-house expertise by working in partnership with the wider science community.**

We support world-leading research, and training of future subject matter experts, by funding postgraduate students in research areas including alpha-emitting materials and novel advanced manufacturing technologies. Working alongside UK Research and Innovation CDTs we will develop further PhD-level research programmes across civil and defence to enable students to network and link with civil (fission and fusion) CDTs.

AWE has a wide programme of engagement with 37 UK universities, and five strategic alliances with the universities of Bristol, Cambridge, Cranfield, Heriot-Watt and Imperial. In addition, 93 'year in industry' posts are provided to UK universities by AWE. It is also a member of the UK's High Value Manufacturing Catapult Centres in Coventry and Sheffield. This provides insight into advanced manufacturing technologies and access to critical skills traditionally found in the regions.

The DNE is diversifying its footprint and creating satellite locations in cities housing key academic institutions, building on the Catapult Centres. Alongside this, we are also investing in deepening expertise on strategic stability and deterrence issues.

Our industry partners also work extensively with academia. Rolls-Royce Submarines Ltd collaborates with a wide range of academic partners alongside a network of Advanced Manufacturing Research Centres across the UK to deliver advanced technologies and nuclear research.



AWE's extensive graduate intake features 127 graduates across two cohorts under the **Evolve Graduate Programme**. Graduates work across three pathways covering the breadth of AWE's capabilities (engineering, science, and corporate and operations) and are set to commence a fourth pathway on environment, safety, health and quality from October 2024.

Graduates across all pathways are rotated through a series of placements that deliver tangible benefits for AWE. Graduates have the opportunity to shape their placements to develop skills and expertise, often tied to their academic backgrounds.

The first of the Evolve cohorts are due to complete their programme in autumn 2024, and previous AWE cohort graduates have gone on to a wide variety of roles across AWE including as systems engineers, physicists, materials scientists and project managers.

# Part Two: Submarines

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**At least one nuclear-armed, nuclear-powered submarine has been covertly patrolling the world's oceans for over 50 years, carrying the UK's sovereign warheads. This is the Royal Navy's Operation RELENTLESS, the longest sustained military operation ever undertaken by the UK.**

They are supported by maritime patrol aircraft which provide a seamless and world-leading anti-submarine warfare capability, while the Fleet Ready Escort is held at readiness to monitor, track and intercept adversary vessels approaching and transiting UK waters, deterring any attempts to intercept and disrupt our submarine operations. They are also supported by the wider UK defence and intelligence community.

All the UK's current submarines are manufactured by BAE Systems in Barrow and maintained by Babcock International in Devonport and Faslane. The propulsion systems, and their in-service support, are provided by Rolls-Royce Submarines Ltd from their facility in Raynesway, Derby.



# SSBNs: Nuclear armed, nuclear powered

Invulnerable and undetected, our SSBNs guarantee our nuclear deterrent by patrolling the seas at all times, ready to respond to the most extreme threats to the UK.

## Vanguard

Our four nuclear-powered Vanguard Class submarines are equipped with the Trident II D5 missile system and carry the UK's sovereign nuclear warheads. The Royal Navy has been operating CASD patrols in the Vanguard Class since 1993. Babcock International maintains our Vanguard Class fleet, including elements of the nuclear propulsion system, and Rolls-Royce Submarines Ltd supports the nuclear propulsion system while in service. This extends the fleet's operational availability to deliver CASD operations and will continue until the fleet is replaced by the Dreadnought Class.



## Dreadnought

The four Dreadnought Class submarines will begin to replace the Vanguard Class in the early 2030s. They will be the largest, most technically advanced SSBNs ever operated by the Royal Navy, equipped with a new generation of nuclear reactors to provide power and propulsion, designed and manufactured by Rolls-Royce Submarines Ltd. The design will incorporate a range of scientifically advanced electronic systems, sensors and tactical weapons, as well as housing the Trident II D5 missile system.

They are designed and built in Barrow and represent a substantial investment into British industry. At its peak, industry estimate the Dreadnought programme will support around 30,000 jobs and it is reliant upon a supply chain of hundreds of companies based in the UK.

### Dreadnought Alliance

The Dreadnought Alliance brings together the MOD, BAE Systems and Rolls-Royce Submarines Ltd under a joint management team to achieve greater integration as the Dreadnought Class submarine build programme continues. It is focused on collective delivery performance, coordinating scheduling and reporting and reducing risk.

Alongside coordinating delivery stages of the Dreadnought build, the Alliance works to cohere and strengthen industry networks.

# HMS Dreadnought



Artist impression of Dreadnought

# 130

crew members, including three chefs and one doctor

# 153.6

metres in length, the same as three Olympic swimming pools

# 17,200

tonnes of water displaced when submerged

## WEAPONS

12 Trident missile tubes across three compartments, housing the **UK's sovereign nuclear warheads**

Four torpedo tubes, housing **Spearfish heavyweight medium-range torpedoes**

## POWER

The new **Pressurised Water Reactor (PWR3)** nuclear propulsion system will sustain Dreadnought for its whole life

## RANGE

Within the lifetime of its nuclear reactor, the Dreadnought submarine's range is **unlimited**

# SSNs: Conventionally armed, nuclear powered

Protecting the UK's deterrent from hostile activity and detection, whilst supporting global operations.

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## Astute

The Astute Class was first introduced in 2014. They are nuclear powered but conventionally armed. They contribute to protecting the nuclear deterrent and maritime task groups, providing global strategic intelligence. They are fitted with advanced sonar, carry Spearfish torpedoes and can deliver a Tomahawk Land Attack Missile strike capability. They are the most powerful SSNs the Royal Navy has operated to date.

Astute is at the forefront of underwater warfare, combining the qualities of stealth, endurance, reach, speed, autonomy, flexibility and strike capability. These characteristics give the Astute Class unparalleled freedom of worldwide operations, including deep under ice, to support UK, NATO and coalition operations. Astute reflects the UK's investments in conventional forces that underpin the effective operation of the deterrent, support to carrier task group operations, anti-surface warfare, strategic intelligence collection and long-range precision strike. The UK's anti-submarine warfare and secure communications capabilities contribute to NATO's overall deterrence and defence posture.

The UK has four Astute Class submarines in service. The fifth, HMS Anson, is currently undertaking sea trials with the Royal Navy before joining operations. Completing the fleet, an additional two Astute Class submarines are under construction at the BAE Systems facility in Barrow-in-Furness.

## SSN-AUKUS

SSN-AUKUS is a new class of nuclear-powered, conventionally armed attack submarine being developed in partnership with the US and Australia for the Royal Navy and Royal Australian Navy.

The design and manufacturing process will be a complex, multi-decade undertaking, creating thousands of jobs across the UK. Construction of the UK's submarines will take place principally at BAE Systems' Barrow shipyard, with the manufacture of the next generation of nuclear reactors, including reactors for Australia's SSN-AUKUS submarines, taking place at Rolls-Royce Submarines Ltd in Raynesway.

The UK will supply key components to Australia's programme while they develop their domestic industrial capacity. BAE Systems will partner with ASC Pty Ltd to build Australia's nuclear powered submarines.

We are investing a share of the ring-fenced £3 billion funding announced in the 2023 Integrated Review Refresh into new facilities with advanced manufacturing capabilities in Barrow and Raynesway. SSN-AUKUS will enable deeper information and technology sharing and closer integration of security and defence-related science and technology, including propulsion plant systems, common vertical launch systems and conventional weapons from the US. They will be operational from the late 2030s, replacing the current Astute Class.





# Nuclear propulsion

Cutting-edge technology means our submarines can be powered for as long as the mission demands.

All UK submarines are powered by nuclear reactors, which can run for over 20 years without refuelling. This capability means that the UK's fleet can remain dived for extended periods, ensuring their operations remain undetectable to potential adversaries. The reactors are designed and built by Rolls-Royce Submarines Ltd in Raynesway.

The advanced technology in our reactors enables the Royal Navy to undertake high-speed and long-range patrols and retain its fighting edge. This British scientific, engineering and manufacturing expertise is the foundation of our strategic advantage.

**The SSN-AUKUS programme will deliver further development in our naval reactors, further investment in Raynesway and the creation of more than 1,000 highly skilled jobs.**

The development of a future generation of nuclear propulsion systems available to power UK submarines beyond SSN-AUKUS has commenced. 'Nuclear Propulsion Plant – X' will span several decades, providing further opportunity across industry and academia. Its primary aim is to produce a step change in reactor plant design, specifically in terms of performance.



## Our Partnership with Rolls-Royce

For over 60 years Rolls-Royce Submarines Ltd has provided the power for the UK's underwater defences. It currently employs more than 4,500 people to design, manufacture and support the pressurised water reactors that power the Royal Navy's submarine fleet.

The science, technology, engineering and manufacturing expertise deployed in their Derby facility is world leading. The site is set to almost double in size to meet the needs of the DNE, including the AUKUS commitments.

The expansion creates hundreds of new highly-skilled jobs in Derby, including through its new Nuclear Skills Academy, which will graduate 200 students a year for at least the next decade.



# Dismantling and disposal

**The UK's approach to dismantling submarines ensures the safe and secure disposal of radioactive waste.**

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Recognising the legacy of current decommissioned submarines, the DNE is committed to progressing the safe and secure disposal of our submarines and nuclear liabilities, arising from our nuclear propulsion and weapons capabilities.

After our submarines have left service with the Royal Navy and have been defueled, around 90% of the materials, mainly steel and other metals, can either be re-purposed or recycled. This approach will minimise our liabilities for future generations.

Our priority is to develop a leading and sustainable approach to deliver long-term, safe and full disposal capability. Low-Level Waste (LLW) has now been safely removed from a total of four submarines, each one with more waste being managed to final disposal, faster and at lower cost per tonne than the last. HMS SWIFTSURE is currently being dismantled in Rosyth and on track for final disposal to take place in 2026. This will be a world-first for the complete dismantling of a nuclear submarine, acting as a demonstrator in developing our future approach.

This has been used to prove that the dismantling processes and procedures being developed under the programme are safe, secure, sustainable and environmentally responsible.

We are also investing in our infrastructure in Devonport to establish a modern, safe defueling capability. Once complete, this investment in infrastructure around our maintenance and disposal facilities will free up valuable dockyard space by reducing the number of submarines we hold in storage, decreasing the costs associated with storage and maintenance and allowing us to accelerate the programme.

We have also engaged the market to explore routes to establish a future long-term national capability able to meet the needs of all future classes of submarines as they leave service, demonstrating our commitment to enhance our credibility as a safe and competent nuclear submarine operating nation. These will support the changing requirements for maintenance and decommissioning as the specifications of our submarine capability evolve and ensure that we have delivered a full life-cycle capability.



# Royal Navy bases

The heart of our Submarine Service, our bases support our fleet and protect our capabilities.

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**HMNB Clyde**, west of Glasgow, is comprised of two sites: Faslane and Coulport. It is home to the UK's Submarine Service. The largest military establishment in Scotland, employing over 6,000 people, it is where routine submarine maintenance and dockings take place.

The Royal Naval Armaments Depot at Coulport is responsible for the storage, processing and maintenance of the Trident II D-5 ballistic missile and the UK nuclear warhead.

Ongoing infrastructure programmes will enhance HMNB Clyde's capability over the coming decades, providing additional docks, berths, state-of-the-art submarine training facilities and crew accommodation. This investment in Clyde will ensure that the naval base is ready to support the arrival of the Dreadnought Class and SSN-AUKUS, while maintaining current operations.

**HMNB Devonport**, is the largest naval support site in Western Europe, employing close to 12,000 people, and is where our in-service submarines are maintained, modernised and refitted. Devonport is undergoing a series of major upgrades to infrastructure over the next decade, which will transform the naval base into the submarine deep maintenance centre of excellence to support Defence's highest priority.

The planned infrastructure work will modernise the docks, equipment and supporting infrastructure. This includes construction of a new non-tidal maintenance berth, delivery of refurbished dry docks for Astute Class deep maintenance and future-proofing the naval base for the arrival of Dreadnought and SSN-AUKUS.



# Part Three:

## Missiles and warheads

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**One of the DNE's core responsibilities is to ensure the UK maintains a safe, secure and reliable warhead stockpile.**

Alongside this, our close partnership with the US provides the UK with access to the Trident II D5 missile stockpile. The missiles are fitted with a sovereign UK nuclear warhead. The UK and the US work together on nuclear matters through the Mutual Defense Agreement and the Polaris Sales Agreement.

Our capability is maintained by AWE's 7,000 strong workforce, with a cohort of 3,500 scientists and engineers working with industrial, government and academic partners.

In 2023, the UK completed an update of its warhead, transitioning from the Mk4 to the Mk4A by replacing non-nuclear components. The Mk4 warheads are being disassembled and their component elements reused, recycled or safely disposed of.

AWE has commenced work on a sovereign replacement warhead, as part of an evolutionary cycle that ensures we have an in-service warhead that can be safely assured from design to disposal. The design needs to be developed to meet future threats, taking advantage of new technology and manufacturing processes.



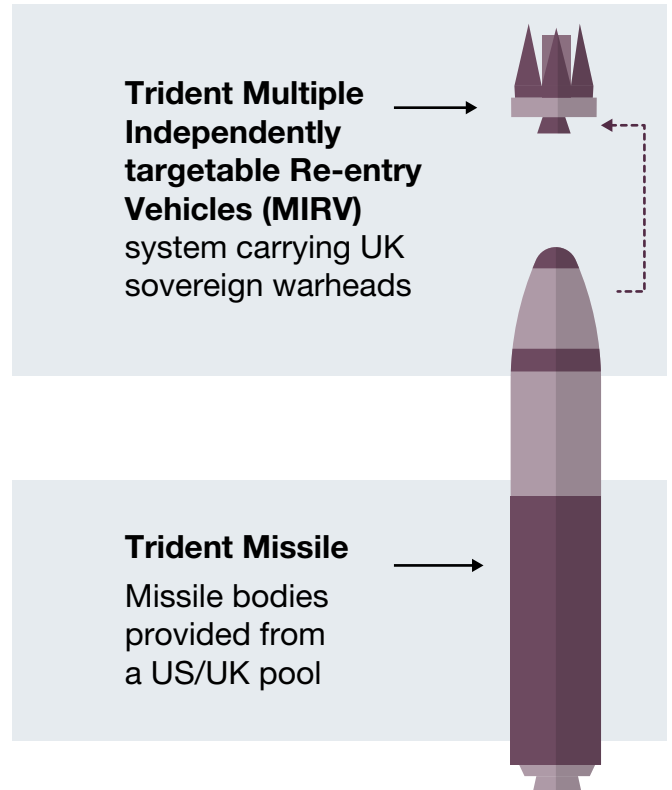
# Trident missile system

Fitted with the UK's sovereign warhead, the Trident missile has a range of thousands of miles, ensuring the credibility and effectiveness of our deterrent.

The Trident II D5 Strategic Weapon System is manufactured in the US. It comprises the missiles and supporting systems fitted on the submarine as well as training and shore support equipment.

Under the 1963 Polaris Sales Agreement, the UK accesses a shared missile pool. Missiles are loaded into our submarines in Kings Bay, Georgia, US. The UK-manufactured warheads are mated to the missiles at HMNB Clyde.

The Trident system is operated by both the Royal Navy and US Navy. This enables mutual assurance of performance and safety. It remains one of the most enduring and effective examples of a strategic partnership between the two nations.



## Mutual Defense Agreement

The Mutual Defense Agreement is a bilateral treaty between the UK and US and has been in place since 1958. It enables cooperation between the two countries in the uses of atomic energy for mutual defence purposes, including the exchange of nuclear materials, technology and information. The Mutual Defense Agreement has underpinned the UK–US nuclear relationship for more than 65 years.

## Polaris Sales Agreement

The 1963 Polaris Sales Agreement is an intergovernmental agreement between the UK and the US that allows the US to provide ballistic missiles (without warheads), equipment and supporting services to the UK. It has been fundamental to UK nuclear deterrence since its signature in 1963.

# AWE

## AWE is responsible for the manufacture, maintenance and development of UK sovereign warheads.

It is the only organisation in the UK that performs precision manufacture of components made from fissile materials, safely managing some of the most sensitive nuclear materials. It produces hundreds of components to micron level tolerances, fulfilling some of the most challenging design requirements that are scientifically achievable. To do so requires working at the extremities of science and engineering to understand the performance of nuclear warheads and assure the safety, security, and effectiveness of our stockpile.

Essential to this is the technology, engineering and manufacturing integrated across the lifecycle of the warhead from initial concept and design to final decommissioning and disposal.

AWE use unique and advanced technologies from purpose-built lasers and x-rays to some of the most powerful supercomputers in the UK. It also deploys unique skills and expertise to support nuclear threat reduction through the forensic seismology and infrasound analysis to detect potential detonations and tests by other countries, using techniques that distinguish seismic signals generated by underground nuclear explosions from those generated by earthquakes, shaping the global approach to nuclear test monitoring.

Through the use of nuclear science and technology, AWE supports the delivery of a credible nuclear deterrent.

## The history of AWE

The UK's post-war atomic weapons programme was established at Aldermaston in 1950. The Atomic Weapons Research Establishment (AWRE) designed and developed warheads for RAF Bomber Command and later the Royal Navy's Resolution-Class submarines carrying the Polaris ballistic missile system.

After Trident was announced in 1980, work began on significant new manufacturing facilities and development of a new warhead (Mk4). In 1987, AWRE merged with the neighbouring Royal Ordnance Factory (ROF) Burghfield and ROF Cardiff and was renamed AWE.

In July 2021, AWE transitioned to become an arm's length non-departmental body under the Ministry of Defence.





## Transforming AWE

**Modernising our infrastructure is fundamental to providing the UK with a safe and secure warhead capability.**

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AWE manages some of the most sensitive materials and advanced technologies in nuclear. It has already undertaken some of the biggest projects in defence to upgrade its unique facilities. These include the High Explosive Fabrication Facility for explosives manufacture, the Leo small components manufacturing facility and the Phoenix conventional manufacturing facility for the production of advanced material components, driving innovation in both construction and science fields.

These new facilities provide modern, safe and secure manufacturing capability to support our warhead stockpile. They form part of the critical transformation of AWE's infrastructure that will deliver the current and next generation warheads, supporting the UK to become a world-leader in new nuclear technologies.

There will be significant investment in AWE's infrastructure in Aldermaston, including the **Future Materials Campus (FMC)**. This programme will renew existing facilities for the manufacture and storage of nuclear materials, improve science and analysis capabilities, and invest in renewed capability for material recovery.

The multi-billion-pound programme of investment requires significant engagement of the wider industrial base to address specific manufacturing, delivery and assurance capability needs. The FMC will contribute to the UK's skills development, creating jobs in the local area and across the UK supply chain. This will drive innovation in both construction and science.

# Replacement warhead

Replacing the UK's warhead will ensure the UK's deterrent remains cutting-edge, safe and effective.

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The UK committed to replacing our sovereign warhead in parliament in February 2021. Using modern and innovative developments in science, engineering, manufacturing and production at AWE, we will ensure the UK maintains an effective deterrent for as long as required.

The Replacement Warhead Programme has been designated the A21/Mk7 (also known as Astraea). It is being delivered in parallel with the US W93/Mk7 warhead and each nation is developing a sovereign design.

This will be the first UK warhead developed in an era where we no longer test our weapons underground, upholding our voluntary moratorium on nuclear weapon test explosions. This is possible because of the long history of technical expertise and extensive investment in UK modelling and simulation, supercomputing, materials science, shock and laser physics at AWE.

Replacing the UK warhead is a long-term programme, driving modernisation and construction at AWE, HMNB Clyde and the hydrodynamics facility at EPURE, in France.







## Testing

**In line with our commitment not to conduct nuclear weapon test explosions, the UK has developed capabilities in modelling and non-nuclear testing to ensure safety and efficacy are maintained.**

We have developed unique and world-leading technology to validate the UK's warhead stockpile. The Orion laser helps our physicists and scientists research the physics of those extreme temperatures and pressures found in a nuclear explosion to better understand the safety, reliability and performance of nuclear warheads. Orion is used collaboratively with UK academia and US teams in their National Laboratories.

Supercomputing is also a crucial capability, enabling simulations that allow us to develop a safe, assured warhead without detonation. AWE has recently commissioned a supercomputer named Valiant, one of the most powerful computers in the UK, to validate the design, performance and reliability of our nuclear warhead.

These facilities will be used to bring our next warhead into service, upholding our voluntary moratorium on nuclear weapons test explosions.

EPURE is a technologically-advanced hydrodynamic facility at Valduc, in France, near Dijon. Hydrodynamic testing uses radiography to measure the performance of materials at extreme temperature and pressure.

While the UK and France maintain operational independence, the facility will be jointly managed, with both nations performing sophisticated experiments to inform their modelling of the performance and safety of the nuclear weapons without undertaking nuclear explosive tests.

This makes an important contribution to assuring the performance of our next generation of nuclear weapons without nuclear weapon test explosions.

# Part Four: Safety and security

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**The DNE's responsibilities span beyond the design, construction, and maintenance of our capabilities and cover the entirety of the nuclear lifecycle, encompassing our liabilities and the safe management and disposal of our assets.**

We work with industry, our arm's length bodies, and regulators to uphold the highest levels of safety and security for our people, capabilities, technology (including nuclear materials), facilities and information.

Our extensive threat reduction programmes protect the environment and maintain our international commitments to the safe management of our nuclear materials.

Our engagement with our international partners underpins our ability to guarantee nuclear security. Our responsibilities extend to joint programmes with the US, France and Australia, and our nuclear deterrence commitments with NATO sit alongside our international commitments on nuclear security and non-proliferation.

These agreements and obligations are essential to ensuring our national security while guaranteeing the security and cooperation of our allies.

# Regulation

**The UK works in accordance with international standards published by the International Atomic Energy Agency (IAEA) and national legislation to ensure a safe, secure, and sustainable nuclear enterprise.**

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The DNE operates within an extensively regulated and assured environment. It secures our assets, safeguards the health of our workforce and guarantees the defence of our nation in accordance with international standards published by the IAEA and national legislation.

We are committed to working with our regulators to maintain safety and high standards of environmental protection. This applies to some of our industry partners and AWE, enshrining the expected standards of safety against the sensitive nature of equipment and materials being handled.

We work closely with the Defence Nuclear Safety Regulator, the Office for Nuclear Regulation, and the Defence Maritime Regulator. All three play a critical role in regulating organisations across the enterprise around nuclear safety, the safety of explosives and ordnance, movements and transport, fuels and gases, and public and occupational safety.

Environmental protection is central to our work and is a key foundation to meeting our sustainability goals. We work closely with the Environment Agency and the Scottish Environment Protection Agency to ensure the work we do across the breadth of the enterprise meets their high standards for protecting our environment.

As outlined in the Defence Command Paper 2023, this government asserts that there is nothing contradictory between Environmental, Social and Governance (ESG) principles and the defence industry. On the contrary, a strong national defence, including our nuclear deterrent, is a pre-requisite for the freedoms (including social liberties) which we often take for granted, and the aspirations that investors and financial services companies seek to address using ESG considerations.

As stated in the Green Finance Strategy published in Spring 2023, the government believes that continued private investment in the UK defence industry and its NATO allies is essential to protect the UK national interest, the UK economy and broader environmental and social goals.

# Our preparedness and emergency response

**Our nuclear emergency and counter-terrorism teams are on standby to respond to any incident involving nuclear materials, no matter how unlikely.**

The risk of an incident that could pose a radiological threat to the public or the environment is extremely low. Despite this, under the Radiation (Emergency Preparedness and Public Information) Regulations 2019, we work closely with all applicable organisations to fully consider and prepare for all possible events that may arise – no matter how unlikely. Our regulators provide appropriate oversight, and all arrangements are regularly tested to guarantee continued effectiveness.

Beyond our statutory and operational responsibilities, the Ministry of Defence is the lead government department for emergencies involving defence nuclear assets. The Home Office is the lead government department for emergencies arising because of a terrorist event.

## **Nuclear Threat Reduction (NTR)**

The Home Office, the DNO, and AWE also conduct a NTR programme. AWE's capabilities help to assure the security of our borders against the illegal transportation of nuclear material, and global security through their monitoring programmes. AWE also maintains emergency and counter-terrorism teams to support the government's wider response in the event of a nuclear or radiological incident, sitting alongside specialist military responders.

We make a significant contribution to global nuclear test monitoring through AWE's forensic seismology and infrasound analysis. This is not only key to maintaining our national security but also upholding our role in monitoring tests in support of the CTBT Organization.



# The Nuclear Decommissioning Authority (NDA)

The NDA is responsible for disposal of higher activity wastes at the end of the lifecycle for all UK organisations, including the DNE.

The DNE, NDA and DESNZ are coordinating approaches to consolidate or share storage of waste, materials, and transport. We are also sharing assets involved in dismantling, decommissioning and disposal. The DNE is currently in the process of transferring some legacy defence nuclear liabilities to the NDA. Our collaboration with DESNZ, Sellafield, and the LLW Repository has seen the NDA use its own facilities to treat and manage waste from AWE.

To ensure its safe, secure management, the DNE has already invested in the facilities and skilled resources at Sellafield to prepare some of AWE's Higher Activity Waste for long-term storage.

The DNE continues to fund NDA in support of maturing the concept for a future Geological Disposal Facility and is working across government to develop a packaging and conditioning arrangement for our irradiated fuel, should it be disposed of. We will do this while ensuring that we meet our international security obligations, and that management of our irradiated fuel adheres to the principles of the NPT.

This collaboration not only ensures responsible and efficient waste management that safeguards the public and environment, but also represents a significant saving for the UK taxpayer.







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