Nuclear Weapons Analysis Project

The United Kingdom and Nuclear Deterrence in a Time of Geopolitical Competition

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Russia's aggression against Ukraine and irresponsible nuclear rhetoric has fuelled a European and global discussion around the role of nuclear weapons in national and international security. There is widespread agreement among NATO allies that nuclear threats are increasing and recent Summit communiqués indicate a new focus on strengthening deterrence.

The most recent review of UK national security anticipates that state threats will increase in Europe and beyond in the coming years with an attendant risk of escalation. The United Kingdom will maintain a force of submarine-launched long-range nuclear-armed ballistic missiles far into the future. The UK nuclear force provides continuous deterrence by ensuring that one submarine is always on patrol and ready to launch missiles when ordered to do so.

On 4 July 2024 the Labour Party won a General Election and returned to government with a large Parliamentary majority, becoming the custodian of UK nuclear weapons. The role that the UK nuclear forces play today in promoting national and international security, and how they might contribute further in future, will be important issues for a new government to consider as part of the Strategic Defence Review (SDR) that it announced in July 2024.[1].

The departing government underlined that the threat environment justifies increasing the size of the UK nuclear weapon stockpile and an increased focus on nuclear and non-nuclear deterrence. The new government has signalled continuity in the approach to nuclear weapons, but a new 'root and branch' national defence review will advise on how to respond to acute threats while addressing pressing public finance challenges. Whether to continue with the planned increase in the size of the nuclear weapon stockpile is one decision the new government will have to make.

This memo describes the current status of UK nuclear weapons and explains the context for the questions facing the new government.

Introduction

The last time the Labour Party replaced a Conservative government, in 2005, it assessed whether to replace the nuclear-armed submarines on which the UK strategic deterrent depended. In 2006 a review recommended buying four replacement submarines to ensure that the UK nuclear deterrent was viable until the 2030s.[2]

The future of the UK nuclear deterrent has sometimes been a divisive issue within the Labour Party. In the 2019 General Election the Labour Party pledged to retain nuclear weapons if elected but Jeremy Corbyn, the then Party Leader, stated that as Prime Minister he would instruct the UK Armed Forces never to use them.[3] Several politicians who are now ministers in senior positions, including the Deputy Prime Minister and the Foreign Secretary, have previously voted not to renew the UK nuclear deterrent. However, the policy of the new government indicates a large degree of continuity.

During the 2024 election campaign the Labour Party leader, Keir Starmer, announced a 'triple lock' on the UK nuclear weapons programme. The triple

1 Ministry of Defence, *The Strategic Defence Review: A root and branch review of UK Defence*, London, 17 July, 2024.

2 *The Future of the United Kingdom's Nuclear Deterren*t, Command Paper CM994, December 2006.

3 Patrick Wintour, 'Jeremy Corbyn: I would never use nuclear weapons if I were PM', *The Guardian*, 30 September 2015.

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lock included maintaining Britain's continuous at-sea deterrent (CASD) by ensuring that at least one submarine with nuclear-armed long-range ballistic missiles was always out on patrol; a commitment to construct four new nuclear submarines to sustain CASD into the far future; and delivering any future upgrades needed to sustain the effectiveness of the capability.[4] As Prime Minister Starmer has indicated a willingness to authorize the use of nuclear weapons in certain circumstances, noting that the deterrent is 'a vital part of our defence — and of course that means we have to be prepared to use it.'[5]

One guideline for the 'root and branch' review of UK security and defence announced by the new government is the commitment to modernise and maintain the nuclear deterrent.[6] However, the incoming government faces a serious problem in managing public finances, and the terms of reference for the SDR include assessing 'the efficiency and effectiveness of the nuclear programme'. As one analyst has noted, 'it is inconceivable that CASD, or some element of it, will not come under scrutiny as the new government juggles its spending commitments.'[7]

The Defence Nuclear Organisation (DNO) is responsible for delivering the agreed modernisation programme within the sum delegated from the overall defence budget. The UK National Audit Office has concluded that the total range of defence equipment scheduled for acquisition under current plans is unaffordable with the existing defence budget because of cost increases since plans were originally laid down. The programme to modernise the UK nuclear deterrent is responsible for one of the largest cost increases.[8]

The programme to maintain the UK nuclear deterrent is considered the highest political priority within the Ministry of Defence (MOD) budget. In March 2023 the government 'ringfenced' the financing of the nuclear programme in a fund that is partly allocated to the DNO and partly held centrally. As a result, the defence nuclear enterprise is considered separately from other defence spending. The MOD has flexibility to move finance from year to year and to reallocate funds across different parts of the nuclear enterprise that is not available in other parts of the defence budget. The MOD may not move finance from the nuclear enterprise to support other non-nuclear projects. Programme delays may mean milestones are achieved later than planned, but there seems little doubt that the modernization of the nuclear deterrent will be achieved.

The changing international discourse around nuclear deterrence will provide the context for decisions about the future role of UK nuclear weapons.

First, the United States is making its own review of nuclear weapons policy and programmes to take account of developments in China and Russia. All aspects of the UK nuclear weapons enterprise are deeply integrated into bilateral cooperation with the United States, and the future trajectory of trans-Atlantic relations will be a critical factor in determining UK policies.

Second, assessing the role that the UK nuclear force should play in the revitalized European discussion on how to respond to Russian nuclear coercion. Today the United States is willing to accept significant risk to its homeland security to defend Allies. However, the need for European countries to take a greater responsibility for their own defence as the US balances its global responsibilities is recognized increasingly widely.

Third, examining whether the UK could contribute to a cooperative European nuclear arrangement while respecting the legal basis for US-UK nuclear cooperation.

Before offering some observations on the issues above it is necessary to outline UK nuclear capability and policy.

Capability and Policy

The UK nuclear deterrent consists of four nuclear-powered Vanguard Class submarines, each equipped with the Trident II D5 missile system. What the UK describes as 'sovereign nuclear warheads' arm the US-origin missiles. Between 1998 and 2021 the UK increased the transparency around the nuclear weapon stockpile. While the UK was traditionally tight-lipped about the size of its nuclear arsenal, the then Labour government announced a planned reduction in the

4 Aletha Adu, 'Keir Starmer to declare Labour as 'party of national security'', *The Guardian*, 2 June 2024, https://www.theguardian.com/politics/article/2024/jun/02/keir-starmer-to-declare-labour-as-party-of-national-security.

5 Andrew McDonald, 'UK Labour talks up nuclear weapons to banish Corbyn's shadow', *Politico*, 3 June 2024, https://www.politico.eu/article/uk-labour-talks-nukes-escape-jeremy-corbyn-shadow/.

6 UK Ministry of Defence, *New Era for Defence: government launches root and branch review of UK Armed Forces*, 16 July 2024.

7 Paul Cornish, *UK Continuous At Sea Deterrent: Unwise? Unaffordable? Unethical?*, 13 August 2024.

8 National Audit Office, *The Ministry of Defence Equipment Plan 2023–2033*, HC 315, 4 December 2023.

British warhead stockpile from 'up to 300 warheads' to 'less than 200 operationally available warheads'.[9]

In 2021 the UK announced an increase in the future nuclear stockpile to 'no more than 260 warheads'.[10] At the same time the government announced that in future there would be no public comment on the size of the operational stockpile, the number of deployed warheads or deployed missiles. Recent non-governmental estimates suggest that the UK nuclear weapon stockpile currently includes 'approximately 225 warheads' of which 'around 120' are operationally available for delivery.[11] In case that the non-governmental estimate is accurate, it would suggest that the policy of increasing warhead numbers is being implemented but is probably not yet completed. The increase would open the way for two submarines currently under construction to be on continuous patrol at some date after 2030, should that be considered necessary.[12]

The four existing nuclear-armed submarines (SSBNs) will be replaced by four new vessels, the Dreadnought Class, scheduled for delivery during the 2030s. The new submarines will continue to carry a version of the Trident II D5 missile, updated through a life extension programme partly financed by the UK.[13]

The Trident warheads will be replaced with a next generation, designated the A21 *Astraea*. While the design is said to be exclusively British, the Replacement Warhead Programme runs parallel with the US W93 warhead since both will be mated with the same Trident missile.[14]

The survivability of submarines is an essential element of the credibility of the nuclear deterrent. British strategic submarines mainly depend on stealth and concealment for protection, but dedicated forces are also in service to detect and neutralize threats during their passage to the open ocean. The UK is modernizing both its airborne and shipborne anti-submarine warfare capabilities, but to sustain what is seen as a critical advantage the previous Conservative government also made a commitment to developing 'autonomous systems, exploiting AI and machine learning to link sensors and generate a greater collective underwater detection and tracking capability.'[15]

Nuclear weapons policy

The UK has a doctrine based on strategic ambiguity and has considered but rejected a declaratory policy of no first-use of nuclear weapons. No first-use is seen as an effort to manage a nuclear conflict, whereas the UK sees nuclear weapons as part of an integrated approach to preventing the outbreak of war. The ambiguity about precisely when, how, and at what scale the UK would use nuclear weapons is deliberate. It is believed to complicate the calculations of a potential aggressor. While there will be a response should the UK or an ally suffer an act of aggression, the adversary will not know in advance the precise nature of that response. In calculating whether to act an adversary cannot be certain that the response will not include the use of nuclear weapons.

The rationale for a UK nuclear deterrent during the Cold War was linked to the risk of Soviet aggression. The government established the threshold of the 'Moscow criteria' which has been described as the ability to threaten to inflict sufficient damage on Moscow and a number of other Soviet cities at any time of the day, 365 days of the year even after a Soviet nuclear surprise attack.[16]

At the end of the Cold War a new analysis examined nuclear weapons in the context of the newly independent Russian Federation and UK participation in a major military action to reverse Iraq's invasion of Kuwait.[17] The assessment in respect to Europe was that Russian disarray was temporary. Russia would become the pre-eminent military power in Europe with a large and diverse nuclear arsenal. The information about Iraqi

9 UK Ministry of Defence, *Modern Forces for the Modern World: Strategic Defence Review*, July 1998. In 2010 the government added that by the mid-2020s the overall stockpile would include 'not more than 180' operational weapons.

10 *Global Britain in a competitive age: The Integrated Review of Security, Defence, Development and Foreign Policy*, March 2021, p. 76.

11 Hans M. Kristenson and Matt Korda, 'British Nuclear Forces' in *SIPRI Yearbook 2024: Armaments, Disarmament and International Security*, Oxford University Press: Oxford 2024.

12 Lawrence Freedman, *Thread on UK nuclear weapons policy. Be patient. Quite long.*, 16 March 2021.

13 UK Parliament, *Trident Missiles: Question for Ministry of Defence*, tabled on 26 June 2023, answered 29 June 2023.

14 *Delivering the UK's Nuclear Deterrent as a National Endeavour*, UK Ministry of Defence, London, March 2024; Shane Ward, 'America's new multibillion-dollar nuclear warhead is a great deal for the British', *Bulletin of the Atomic Scientists*, 14 April 2022.

15 UK Ministry of Defence, *The Defence Capability Framework*, July 2022, p. 29.

16 Kristan Stoddart, 'Maintaining the 'Moscow Criterion': British Strategic Nuclear Targeting 1974–1979', *Journal of Strategic Studies*, vol. 36, 2008.

17 The following paragraphs summarize the main conclusions based on the speech delivered by the Minister of Defence, Malcolm Rifkind, *UK Defence Strategy: A continuing role for nuclear weapons*, 16 November, 1993.

investment in a nuclear weapons programme uncovered in 1991 drew attention to the risk that nuclear non-proliferation might fail, and the UK could find itself in conflict with states or regimes with different views on the role of nuclear weapons and nuclear deterrence.

The new assessment concluded that UK nuclear forces would be needed as part of an integrated strategy for war prevention and for homeland protection. At the same time, retaining tactical nuclear weapons would be counter-productive to the objective of building a new and cooperative relationship with Russia. Furthermore, introducing tactical nuclear weapons into regional security dynamics in the Middle East or elsewhere could only be destabilizing and an incentive for further proliferation.

The assessment recommended retaining a strategic arsenal but retiring tactical weapons. The UK retired the last of its air-launched nuclear weapons in 1998.

As part of the transition from Polaris missiles to Trident the UK nuclear force acquired a capability described at the time as 'sub-strategic' partly based on the possibility of reducing the yield of warheads. The warhead mated to the Trident II D5 missile is said to be 'closely related' to the American W76 warhead but designed and manufactured in the UK.[18]

In 1998 the UK Defence Minister George Robertson informed the House of Commons that the UK 'has some flexibility in the choice of yield for the warhead on its Trident missile.'[19] This flexibility in the potential scale of nuclear use is believed to make the UK deterrent more credible against the range of possible nuclear threats. However, the UK no longer describes the lower-yield capability as 'sub-strategic' on the basis that any use of UK nuclear weapons would be strategic in intent and in effect.[20] The different nuclear options form part of a deterrence continuum.

A former Director of Nuclear Policy at the Ministry of Defence has made it clear that the UK does not envisage tactical use of nuclear weapon, but that the flexibility in yield 'offers the government of the day an extra option in the escalatory process before it goes for an all-out strategic strike which would deliver unacceptable damage to a potential adversary. It gives it a lower level of strike with which to demonstrate will, intent or whatever. It does not have to be used at all but it gives the government of the day that extra option at the sub-strategic level.'[21]

In the UK all nuclear weapons are 'on the right hand of the deterrence equation to be used in extremis when the survival of the nation state is at stake'.[22]

Issues and challenges

The United States is facing a major challenge in implementing an ambitious nuclear modernization programme at the same time that the level of nuclear threat is increasing in three respects: 'changes to adversaries' postures, coordination among adversaries, and disengagement from arms control'. As a result, the US is 'looking for ways that allies can contribute to nuclear deterrence'.[23] The close UK-US nuclear relationship makes it certain that trans-Atlantic discussions will explore how nuclear weapons can be leveraged in the expected strategic environment.

The UK nuclear deterrent is intertwined with the United States

Anglo-American cooperation on nuclear weapons has been based on reciprocity since the 1940s, when the UK shared with the US its own research into how the potential for an atomic explosion could be contained in a device small enough to be carried by an aircraft.[24] When the UK cancelled the domestic programme to develop and build a medium-range ballistic missile called Blue Streak in 1960 the United States agreed to make an alternative system available, formalized as Polaris submarine-launched missiles.[25] From that point the independence of the UK nuclear deterrent has been questioned by analysts.

18 Michael Clark, 'Does my bomb look big in this? Britain's nuclear choices after Trident', *International Affairs*, vol. 80, 2004, pp. 50-51.

19 Written answer by Secretary for Defence George Robertson to a question posed by Ms. Roseanna Cunningham MP, Hansard, 19 March 1998, https://hansard.parliament.uk/Commons/1998-03-19/debates/b2a203be-81e0-4147-9c19-34c967dece9d/Trident.

20 Foreign Secretary William Hague, Written reply to question from Sir John Stanley on sub-strategic and tactical nuclear weapons, 20 February 2012.

21 Commodore (Rtd.) Tim Hare, evidence to the House of Commons Select Committee on Defence, 28 March 2006.

22 Commodore (Rtd.) Tim Hare, evidence to the House of Commons Select Committee on Defence, 28 March 2006.

23 Remarks by Senior Director Pranay Vaddi at *Nuclear Deterrence in a "Fundamentally Different Global Setting"*, Annual Symposium on Strategic Weapons in the 21st Century, Lawrence Livermore, 18 April 2024.

24 US Department of Defense, *Nuclear Matters Handbook*, 2020.

25 House of Lords debate on the cancellation of Blue Streak, 3 May 1960. President John F. Kennedy and Prime Minister Harold Macmillan reached a political agreement on 21 December 1962. The *Statement on Nuclear Defence Systems* (the so-called Nassau Agreement) set the framework for a subsequent legal commitment, the 1963 Polaris Sales Agreement.

The United States provides the UK privileged access to information and intelligence that it could not acquire either by itself or from any other partner. The UK also depends on US facilities to unload and reload Trident missiles. However, the UK is able to launch nuclear weapons without US approval. Authoritative sources have confirmed that the United States does not have any technical device blocking launch and so 'in the last resort, when the chips are down and we are scared, worried to the extreme, we can press the button and launch the missiles whether the Americans say so or not.'[26]

The independence of UK policy has also been questioned.[27] By the 1960s the UK no longer saw prevailing in a major power conflict acting alone as a reasonable objective, but the UK has sought to maintain a significant part of the Western deterrent under sovereign control.[28] At their meeting in Nassau in 1962 the British Prime Minister suggested, and the US President agreed, that some part of UK forces would be assigned as part of a NATO nuclear force and targeted in accordance with NATO plans.

Nuclear weapons remain under the strict legal ownership and political control of the United States and the United Kingdom, and it is difficult for NATO to have an independent nuclear posture. Nonetheless, although the decision on the use of UK nuclear weapons is sovereign, a collective action taken in the framework of NATO would impose political and operational constraints.

A nuclear mission carried out under the NATO flag requires explicit political approval by NATO's Nuclear Planning Group (NPG) as well as authorisation from the US President and UK Prime Minister.[29] Operationally, the NATO Maritime Command (led by a Royal Navy officer) incorporates Submarine Command, led by a US Navy officer. All submarines assigned to NATO come under Submarine Command in wartime, so mission planning for operations involving submarine-launched weapons would be a joint US/UK task.

In those circumstances Royal Navy SSBNs assigned to NATO are simultaneously a national fleet and a NATO fleet. The arrangement means that the legal obligation to ensure that nuclear weapons are not transferred outside UK ownership and control is satisfied, and Prime Ministerial command is respected, while still meeting Alliance needs.

Whether inside or outside the NATO context, dialogue and coordination with the United States would be paramount prior to the UK authorizing nuclear use. It has been said that the UK strategic nuclear capability in effect operates in conjunction with the US Navy in the framework of US integrated nuclear planning.[30] As the US explores how Allies can assist in managing accumulating strategic risks the UK would logically be one of the first places for Washington to turn.

Maximising the European contribution

Deterring a nuclear attack on an Ally remains one 'fundamental role' for US nuclear weapons.[31] However, the UK nuclear force has always taken account of the risk that the United States would not extend deterrence to its Allies in some future scenario. This contingency could arise in one of three ways.

- *A US choice not to bring its nuclear forces to bear in a crisis:* Nuclear forces might not be committed if a US President was intimidated by the implications of deployment, did not share the Allied view of the current danger or held an Ally responsible for precipitating a crisis through an irresponsible action.

- *Competing priorities fully absorb US resources:* For example, a future Sino-US crisis could impact the availability of US nuclear assets elsewhere.

- *Greater US insularity and progressive disengagement:* Michael Quinlan referred to the risk of 'a deeper and longer-term estrangement from its friends' leading to a dilution of US cooperation and perhaps a withdrawal from security commitments.[32]

While less than the strategic arsenal of the United States, non-governmental estimates suggest that the

26 Sir Michael Quinlan in *The Future of the UK's Strategic Deterrent: The Strategic Context, House of Commons Defence Committee*, 20 June 2006, p. 21.

27 A Chinese military commentator recently described UK nuclear weapons as 'the embodiment of US nuclear deterrence in Europe'. Wu Minwen, 'Nuclear war looms closer amid confrontation', *China Military Online*, 25 June 2025.

28 'The United States has a very large deterrent and we are contributing towards it. It is really as simple as that.' Lord Carrington Opening statement for the Government in the House of Lords debate on the cancellation of Blue Streak, 3 May 1960.

29 Timothy Andrews Sayle, 'A nuclear education: the origins of NATO's Nuclear Planning Group', *Journal of Strategic Studies*, September 2020.

30 Written evidence from Professor Norman Dombey to the House of Commons Foreign Affairs Select Committee, 2 November 2009.

31 *Report on Nuclear Employment Strategy of the United States*, 30 November 2020.

32 Michael Quinlan, 'The future of United Kingdom nuclear weapons: shaping the debate', *International Affairs*, vol. 82, 1982

nuclear forces of the UK and France may have a combined arsenal of over 400 deployed warheads, with roughly 150 more in storage. In November 1992 France and the United Kingdom established a Joint Nuclear Commission and in 1993 it was decided that the body would become a permanent arrangement convened regularly for strategic discussion on nuclear deterrence policy; nuclear proliferation; and nuclear disarmament.[33]

A coordinated Franco-British force could make a formidable deterrent even if the Russian nuclear force is larger. As former Prime Minister John Major summarized the Franco-British perspective: 'President [Chirac] and I have concluded that the vital interests of one could not be threatened without the vital interests of the other equally being at risk.'[34] However, the entanglement of UK nuclear weapons with the United States has a legal foundation that also has an impact on how weapons can contribute to European security.

In 1957 the UK demonstrated that it had the technical knowledge to build thermonuclear weapons but lacked the quantities of fissile material needed to produce a viable arsenal.[35] As noted above, discussions on UK access to US weapon delivery systems were also ongoing in the late 1950s. In 1958 the US legislated to permit the transfer of nuclear weapon design information, nuclear materials and specialised components to allies, that have made 'substantial progress in the development of atomic weapons' (though the legislation prohibits transfer of a nuclear weapon).[36] Modifying the 1954 Atomic Energy Act paved the way for a bilateral Agreement for Cooperation on Uses of Atomic Energy for Mutual Defence Purposes (MDA) that has remained at the core of UK-US nuclear cooperation.[37]

Under the MDA the UK may not communicate classified US-origin 'information, sensitive nuclear technology, and controlled nuclear information, or transfer or permit access to or use of materials, or equipment, made available by the other Party pursuant to this Agreement to any nation or international organization' without prior US consent.[38] In November 2024 the MDA was extended indefinitely.[39]

The legal framework for UK-US cooperation constrains what information the UK could discuss with France bilaterally, but does not preclude all forms of cooperation. The TEUTATES Treaty between France and the United Kingdom that was signed on 2 November 2010 provides the basis for joint construction and operation of research facilities that help the two countries ensure the safety of their nuclear weapons at the lowest cost and share some knowledge and expertise while respecting the MDA.[40] The trilateral partnership on nuclear issues that France, the UK and the US have developed is the most likely framework for common positions on how to maximise the contribution of European nuclear weapons to European security. This 'P3' format allows for discussion and cooperation that respects the established legal frameworks.[41]

Addressing future contingencies

The primary focus of the UK is implementing existing modernization plans that are considered sufficient for current needs. However, the review of the UK defence nuclear enterprise published in 2024 promised to keep nuclear posture 'under review in light of the international security environment and the actions of potential adversaries'.[42]

Investment across the nuclear enterprise, including the technology and industrial base, should enable the UK to adapt to changing conditions if necessary. Some experts have recommended that the new government assess fielding an additional nuclear weapon option alongside submarine-launched missiles as part of the current Strategic Defence Review.[43] Suggestions include 'an air-launched tactical nuclear missile'

33 Bruno Tertrais, *Entente Nucleaire: Options for UK-French Nuclear Cooperation*, British-American Security Information Council (BASIC), London, June 2012.

34 *Mr Major's Joint Press Conference with President Chirac*, 30 October 1995.

35 John R. Walker, *British Nuclear Weapons and the Test Ban 1954-73*, (Routledge: New York, 2018).

36 *Public Law 85-479, An Act to Amend the Atomic Energy Act*, 2 July 1958.pdf.

37 Nuclear Information Service, *US-UK Mutual Defence Agreement*, July 2024.

38 *Agreement for Cooperation on the Uses of Atomic Energy for Mutual Defence Purposes*, Washington DC, 3 July 1958.

39 US Department of State, *United States and United Kingdom Bring Amendment to Mutual Defense Agreement into Forc*e, Washington DC, 14 November 2024.

40 Vincenzo Salvetti, Director of the CEA Military Applications Division and Vanessa Nicholls, UK MOD Director General Nuclear, *TEUTATES: 10 Years of Cooperation Between France and the UK*, November 2020.

41 US Department of Defense, *Nuclear Matters Handboo*k, 2020.

42 UK Ministry of Defence, *Delivering the UK's Nuclear Deterrent as a National Endeavour*, CP 1058, March 2024.

43 Ryan Tully, *UK Nuclear Modernisation is Crucial for US–UK Relations and NATO's Future*, Royal United Services Institute, 11 September 2024.

perhaps based on a planned missile cancelled in the late 1990s;[44] the development of a second nuclear weapon system separated from any dependence on the United States, comparable to the French ASMP air-launched precision-guided missile;[45] and for the UK to include the nuclear-capable F-35 fighter aircraft variant in the fleet the UK is already buying from the United States.[46]

The main use of an additional nuclear option of the kind sketched above would be to signal resolve or demonstrate readiness to meet an attack in a period of heightened tension without the complications that arise from relying upon a single delivery platform. France and the United States promoted media coverage to highlight nuclear exercises and weapon tests in 2022 after the Russian invasion of Ukraine. France put into the public domain the information that an additional French SSBN was at sea and arranged media coverage of a regular exercise to demonstrate the readiness of the airborne nuclear deterrent.[47] The United States publicized a regular scheduled test of a Minuteman intercontinental ballistic missile 'to demonstrate that the United States' nuclear deterrent is safe, secure, reliable and effective to deter 21st century threats and reassure our allies'.[48]

The relatively low-key UK response to Russian nuclear rhetoric after the aggression against Ukraine led to questions about whether that was a matter of choice or a course imposed by an inflexible nuclear force.[49] An SSBN-based monad provides relatively few posture options, and exercising those options early in a crisis might undermine their subsequent impact. A dyad would provide additional signalling options but the UK appears unconvinced about the merits of changing nuclear posture in a period of heightened tension.[50] Changes could be interpreted by an adversary as a sign of hostile intent, or could prompt reciprocal changes that fuel, rather than dampen, escalation. The UK has favoured continuous deterrence so that an adversary will know that a nuclear response is always available.

There are also practical obstacles to changing the current nuclear force structure. The UK assessed different configurations for a national nuclear force when deciding on how to modernize the strategic deterrent in the early 2000s.[51] Reviews have considered six options: a fleet of large aircraft armed with cruise missiles; configuring fast jets to carry either cruise missiles or gravity bombs; cruise missiles deployed on surface warships; cruise missiles deployed on submarines; placing Trident missiles in silos on land and a new fleet of 3, 4 or 5 SSBNs.

The UK is probably facilitating an enhanced role for US extended deterrence by helping to revive a US nuclear weapon storage site.[52] The UK-US MDA prohibits the transfer of a weapon such as the B61-12 bomb, but a nuclear-capable Royal Air Force F-35 fleet would enable UK participation in NATO 'nuclear sharing' by delivering weapons that remain under US ownership.[53]

A fleet of nuclear-capable fast jets would need properly prepared dispersal bases and assured access to them in a crisis, while an aircraft carrier would have to be protected after moving relatively close to the adversary homeland to bring targets into range.

The different options mentioned as supplementary capabilities would also require the development and production of warheads, perhaps based on earlier designs. The UK has a proprietary design for a free fall nuclear bomb, the WE-177 bomb that was withdrawn from service in the late 1990s. The UK began to design a cruise missile warhead in the early 1990s as part of a programme to develop a future theatre nuclear weapon. However, this project was abandoned after the Cold War at a time when a Comprehensive Nuclear Test Ban Treaty (CTBT) was successfully negotiated.

44 Gabriel Elefteriu in Patrick Triglavcanin ed. *How could the UK augment its nuclear forces?*, Geostrategy, 28 March 2024.

45 Beatrice Heuser in Patrick Triglavcanin ed. *How could the UK augment its nuclear forces?*, Geostrategy, 28 March 2024.

46 Andrew Brookes, *The Nuclear Option*, Royal Aeronautical Society, 23 August 2024; Peter Watkins in Patrick Triglavcanin ed. How could the UK augment its nuclear forces?, Geostrategy, 28 March 2024.

47 Jean-Louis Lozier, *The First Nuclear Lessons from the War in Ukraine*, IFRI Briefing, Paris 18 May 2022.

48 US Air Force Global Strike Command, *Minuteman III test launch showcases readiness of US nuclear force's safe, effective deterrent*, 4 June 2024.

49 Jean-Louis Lozier, *The First Nuclear Lessons from the War in Ukraine*, IFRI Briefing, Paris 18 May 2022.

50 Although in 2024 the test of a Trident missile that was publicized and conducted in the presence of the UK Minister of Defence failed. Jonathan Beale and Andre Rhodon-Paul, 'Trident missile test fails for second time in a row', BBC, 21 February 2024.

51 *The Future of the United Kingdom's Nuclear Deterren*t, Command Paper CM994, December 2006.

52 Matt Korda and Hans Kristensen, 'Increasing Evidence That The US Air Force's Nuclear Mission May Be Returning To UK Soil', Federation of American Scientists, 28 August 2023.

53 Andrew Brookes, *The Nuclear Option*, Royal Aeronautical Society, 23 August 2024.

Royal Navy attack submarines are equipped to carry conventionally armed Tomahawk cruise missiles purchased from the United States and the next generation AUKUS Class will carry only advanced non-nuclear capabilities. The strike weapons on UK general purpose submarines are consistent with the Western development of non-nuclear response options to a limited nuclear attack. While the United States is developing a nuclear-armed sea-launched cruise missile, there is no indication that the UK has sought to be included in that project.[54]

The reviews prior to the decision to build a new class of SSBNs armed with updated Trident missiles concluded that 'transitioning to any of the realistic alternative systems is now more expensive than a 3 or 4-boat successor SSBN fleet'.[55] The principal driver of cost for the realistic alternative systems was the need to develop a warhead tailored to the delivery means. Any new warhead would have to be developed without US assistance, and within the legal parameters of the CTBT.

The cost of fielding a supplementary capability alongside the replacement SSBN/Trident force may be unsustainable, but the need for additional future capabilities has not been excluded. The previous UK government seems to have decided to augment national capability by improving the existing nuclear force.[56] Preparing for a second SSBN to be continuously at sea would ensure that a strategic response would remain even if the use of lower yield weapons from one vessel compromised the position of the submarine. This would be consistent with the decision to increase the size of the nuclear weapon stockpile to 'no more than' 260 warheads.

Lawrence Freedman has pointed out that this would also allow the UK to provide extended nuclear deterrence to European allies without compromising its own homeland defence.[57]

Final observations

The United Kingdom is investing to maintain nuclear weapons far into the future. The new government has 'ring-fenced' money for a submarine force, but the exact nature of continuous at-sea deterrence will depend on how the government balances financial pressures and strategic requirements.

Explaining the rationale for maintaining spending on nuclear weapons would be consistent with the relative transparency of previous Labour governments, but public discussion might reopen divisions over nuclear weapons inside the Labour Party.

As part of the Strategic Defence Review the new government will have to decide whether to increase the size of the UK nuclear weapon stockpile in line with the decision of its predecessor. However, recognizing that nuclear dangers are rising, closer coordination and cooperation with allies and partners may be as important as adding new capabilities in meeting future needs. The UK is committed to building understanding and expertise on nuclear issues in NATO and has also promised to maintain and strengthen dialogue on nuclear weapon-related matters within the 'P3' alongside France and the United States. ■

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54 *Nuclear-Armed Sea-Launched Cruise Missile (SLCM-N)*, Congressional Research Service, 19 July 2024.

55 *The Future of the United Kingdom's Nuclear Deterren*t, Command Paper CM994, December 2006. The findings were reconfirmed in a review prior to the award of contracts for building the new submarines – the 'point of no return' for the modernization programme. United Kingdom Ministry of Defence, *Trident Alternatives Review*, 16 July 2013, p. 46.

56 This can be said to follow the precedent of the Chevaline programme, a national project to harden warheads to reduce their vulnerability to Soviet nuclear-armed air defence missiles.

57 Lawrence Freedman, *Thread on UK nuclear weapons policy. Be patient. Quite long.*, 16 March 2021.