SMOKE & MIRRORS

The UK's aircraft contributions to NATO's nuclear mission

NIS Nuclear Information Service

NUKEWATCH

Smoke and mirrors
The UK's aircraft contributions to NATO's nuclear mission

Nukewatch UK and Nuclear Information Service
October 2025

Front cover image:
F-35B aircraft at RAF Marham, June 2018
Credit: Thinh D. Nguyen / UK Ministry of Defence

Contents

‘A nuclear war cannot be won and must never be fought’

Joint statement of the Leaders of the Five Nuclear-Weapon States, echoing the Reagan-Gorbachev declaration of 1985.

Geneva, 3 January 2022.[1]

Executive summary

At the NATO Summit in June 2025 the UK government announced that it intended to purchase twelve F-35A Lightning II Joint Strike Fighter aircraft and join NATO's 'dual capable aircraft nuclear mission' in what it described as the 'biggest strengthening of the UK's nuclear posture in a generation'. This study argues that the government's decision is based principally on providing political 'smoke and mirrors' to distract attention from questions relating to the US – Europe relationship within NATO rather than developing a must-have military capability.

The UK's Trident nuclear weapons system is already assigned to NATO. Although the recent decision to participate in the NATO nuclear sharing mission as well is sometimes presented as a recommendation of the 2025 Strategic Defence Review, the review downplayed the idea of UK participation in the mission and emphasised that the option still needed a detailed study. The initiative is being driven forward by the nuclear lobby within government itself, and raises questions about whether the decision was driven by strategic necessity or political expediency.

The timing of the government's announcement on joining the NATO nuclear mission – to coincide with the 2025 NATO Summit – suggests that it was influenced by a desire to bolster political solidarity within the alliance, particularly in the light of US President Donald Trump's perceived lack of commitment to NATO and concerns that NATO's European members are not contributing enough to NATO. The purchase serves more as an diplomatic gesture than a military imperative, given that it replicates capabilities already provided by other European NATO members and would be dependent upon US capabilities.

Before the UK is able to join the NATO nuclear sharing programme a number of practical matters will need to be resolved.

- *Aircraft procurement and delivery:* The Secretary of State for Defence has stated that he expects the F-35As 'to start being delivered before the end of the decade'. Even if there are no delays in delivery, it will be years, rather than months, before they are available for operation. F-35A maintenance shortfalls indicate that, on current performance, at best only 8 aircraft would be available to take part in a nuclear strike.
- *Operational dependencies:* The B61 nuclear weapons which are core to the NATO nuclear mission remain under US control, rendering the operation entirely dependent on American permission.
- *Certification:* Air squadrons contributing to the NATO nuclear mission are required to meet rigorous certification standards before the US Air Force considers them competent to operate with nuclear weapons. The certification process can be a lengthy programme extending over many months.
- *Other roles:* As well as its nuclear strike role, the RAF intends to use F-35A aircraft on a day-to-day basis as training aircraft. Assigning the F-35A jets to both a training role and a nuclear strike role raises questions about operational nuclear readiness.

The government has justified the F-35A aircraft purchase on three main grounds: strengthening NATO nuclear deterrence by contributing to the NATO nuclear mission; filling a 'capability gap' by providing a nuclear option which bridges the gap between conventional strikes and full-scale Trident retaliation; and cost efficiency.

- *Cost efficiency:* F-35A aircraft cost approximately £20 million less than the F-35B variant per aircraft. Their purchase has some logic in the context of substituting F-35B aircraft with F-35A aircraft for pilot training purposes, and there are advantages in using the F-35A in this role.
- *Role in nuclear deterrence:* It is difficult to see what useful role the UK can add to the NATO nuclear mission. The UK's Trident nuclear weapons system is already committed at all times to NATO use and the UK already pulls its weight in terms of contributing to NATO's nuclear capability. If the UK wants to

contribute to the deterrence posture of NATO, there are more effective ways of doing this using conventional long-range strike weapons.

- *UK theatre nuclear capability:* Participation in the NATO nuclear mission might be seen as a first step in paving the way politically for a programme to develop the UK's own air-launched nuclear weapons. Evidence from the 2013 Trident Alternatives Review shows that this would be an unaffordable, distracting, and futile enterprise which should be resisted at all costs.
- *Political considerations:* Political considerations, both domestic and international, are a factor in any government decision, and have been particularly salient in the UK's decision to buy F-35A aircraft. The politics of the NATO alliance appear to have been an important factor in the substance and timing of the announcement about joining the NATO nuclear mission.
- *Hedging against Trident vulnerabilities:* There are growing concerns about the reliability of the UK's ageing submarine-based Trident nuclear weapon system. The government's decision to purchase nuclear-capable F-35A aircraft makes some sense in the context of a political hedge aimed at saving face with the public in the event of an acute failure in the Trident programme.

The decision has implications for UK foreign policy which would be contrary to the UK's interests. Internationally, the decision to take part in the NATO nuclear mission will be seen as inconsistent with Article VI of the Non-Proliferation Treaty (NPT) by those who have been critical of the UK's disarmament record to date. More importantly, the decision to reinstate an air-launched nuclear capability is contrary to the commitment to apply the NPT principle of irreversibility to nuclear disarmament initiatives.

The view that theatre nuclear weapons have little value as military tools is widely held. It is unrealistic to assume that their use would not lead to escalation and the further use of nuclear weapons, and there are more effective ways of retaliating against a theatre nuclear attack than a nuclear response in kind.

It is difficult to see consistent logic or any need for the UK to purchase F-35 A aircraft and join NATO's nuclear mission from a practical military viewpoint. The decision fundamentally under-estimates the difficulties of re-establishing a nuclear enterprise in the RAF, and has apparently been driven largely by political factors. It is little more than the use of political 'smoke and mirrors' to deceive the public and politicians from other NATO countries into thinking that the UK is taking a significant step to strengthen its nuclear forces when in reality it is doing next to nothing.

1. Introduction and context

CREDIT: LOS ALAMOS NATIONAL LABORATORY

F-35A aircraft loaded with two B61-12 nuclear bombs.

At the NATO Summit in June 2025 the UK government announced that it intended to purchase twelve F-35A Lightning II Joint Strike Fighter aircraft and join NATO's 'dual capable aircraft nuclear mission' in what it described as the "biggest strengthening of the UK's nuclear posture in a generation".[2]

The announcement left many questions unanswered, and raises important issues about strategic rationale, financial prudence, operational feasibility, and the broader implications for UK nuclear doctrine. This briefing examines the government's announcement and what it does and does not commit to doing, and the practicalities and potential consequences of joining the NATO dual capable aircraft nuclear mission[3]. It argues that the government's decision is based principally on providing political 'smoke and mirrors' to distract attention from questions relating to US – Europe relations in NATO rather than on developing a tangible military capability.

The government's decision to buy F-35A aircraft is significant because the F-35A is the only variant of the F-35 aircraft family which is able to use the US B61 nuclear bomb. The B61 weapon is in service with the US Air Force and some European NATO members through a nuclear sharing programme. Fast jet aircraft currently operated by the Royal Air Force (RAF) – the F-35B and the Eurofighter Typhoon – are not able to operate with B61 bombs, and so purchase of the F-35A aircraft potentially gives the RAF a nuclear strike capability using this weapon.[4]

B61 bombs are sometimes described as 'theatre', or 'tactical', nuclear weapons – terms used to indicate that the weapon is designed to be used on a battlefield. These terms are contested, as in reality there is no practical difference between a 'theatre' nuclear weapon and a 'strategic' nuclear weapon in terms of its effects.[5]

According to the Federation of American Scientists, as of the beginning of 2025, six bases in five European countries hosted an estimated 100 US B61 nuclear weapons.[6] Although NATO does not comment on which nations are involved in its nuclear mission, the B61 bombs are believed to be held at bases in Belgium, Germany, Italy, and the Netherlands under the custody of US munitions support squadrons and are available for use by the air forces of the host nation.[7] Further B61 weapons are also held by US forces at Incirlik air base in Turkey.[8] There is strong evidence that in July 2025 B61 nuclear weapons were delivered to the US air base at Lakenheath in Suffolk for deployment with US forces assigned to the base.[9] As well as the nations hosting US nuclear weapons, a wider group of NATO states provide support to nuclear operations, including refuelling and force protection under the Support of Nuclear Operations With Conventional Air Tactics (SNOWCAT) programme.[10]

Joining NATO's nuclear mission would not represent the first time the UK has fielded a theatre nuclear weapons capability, and nor would it be the first time UK military forces have been given access to US nuclear weapons. For most of the Cold War the US government allowed UK forces to share US nuclear weapons under the terms of 'Project E'. The first US nuclear weapons shared through Project E were theatre nuclear weapons allocated to RAF Canberra aircraft assigned to NATO – a similar role to that anticipated for the F-35A aircraft that the government now wishes to purchase. From 1957 to 1972 US Mark 7, and later B43, nuclear bombs were stored at RAF bases in Germany and England and available for use by Canberras. The Canberras were replaced by RAF F-4 Phantom aircraft which continued to carry US nuclear weapons until 1976.

Project E was originally intended to compensate for slow production of UK atomic warheads in the 1950s, when the US agreed to provide the UK with Mark 5, and eventually Mark 15, Mark 39, and Mark 45 nuclear bombs for its strategic V-bomber force. Although intended as a stop-gap provision, V-bombers continued to load US nuclear weapons until 1965. US personnel retained guardianship of the weapons under strict custody arrangements.

Project E nuclear warheads were also used on Thor Intermediate Range Ballistic Missiles based in the UK and operated by the RAF from 1959 to 1963. From 1958 onwards US Corporal, Honest John, and Lance missiles operated by the British Army were also armed with Project E warheads, and US nuclear artillery rounds were also provided by the US. The last Project E weapons were withdrawn from service by the Army in 1992.[11]

During the Cold War the UK also maintained its own stockpile of theatre nuclear weapons. Up to 270 WE177 air-dropped theatre nuclear weapons, with three different variants of the weapon available for use by the RAF and the Royal Navy, were manufactured and remained in service over the period 1966–1998.[12] The government had planned to replace WE177 with a nuclear armed 'Tactical Air-To-Surface Missile' on its withdrawal from service, but these plans were cancelled as a result of funding constraints and the end of the Cold War.[13] Instead, a 'sub-strategic' role was announced for the Royal Navy's Trident nuclear weapon system.[14] Mentions of Trident's sub-strategic role quietly disappeared from the 2010 Strategic Defence and Security Review and subsequent government documents on nuclear doctrine, and although never formally confirmed, the capability appears to have been withdrawn by the Labour government in the late 2000s.[15]

2. The government announcement

The government announced plans to buy nuclear-capable F-35A aircraft in a press release issued by the Prime Minister's Office on 24 June 2025, the day before the 2025 NATO Summit at The Hague at which all NATO Heads of State were represented.[16]

Stripping away all the verbiage, the announcement stated that:

- The UK will purchase twelve new F-35A fighter jets and join NATO's dual capable aircraft nuclear mission.
- The new aircraft will be based at RAF Marham in Norfolk, the main operating base for the UK's F-35 fleet.
- The purchase represents "the biggest strengthening of the UK's nuclear posture in a generation" and reintroduces a nuclear role for the RAF for the first time since the end of the Cold War.
- The F-35A aircraft will be deployed as part of NATO's nuclear dual capable aircraft mission.
- The purchase is intended to demonstrate "the UK's unshakeable commitment to NATO" and support the 'NATO-First' approach recommended in the Strategic Defence Review, which was published at the beginning of June 2025.[17]

An accompanying press release issued on the same day by the RAF provided the following further information:[18]

- The aircraft will be purchased as part of the next phase of procurement for the Ministry of Defence (MoD) F-35 programme, in which a total of 27 aircraft are to be purchased. Instead of purchasing 27 F-35B aircraft as originally planned, the MoD will now purchase a combination of twelve F-35A and fifteen F-35B variants. In total MoD plans to purchase 138 aircraft through the life of the F-35 programme.
- Day-to-day, the F-35As will be used in a training role on 207 Squadron, the 'Operational Conversion Unit' responsible for training F-35 pilots.
- As the F-35A is the common variant of the aircraft among European NATO members, the purchase is intended to contribute to deterrence and interoperability within the alliance.

Despite speculation among media commentators and military analysts, the announcement said nothing about a number of other important matters. It did not, for example, say anything about B61 nuclear weapons or the nuclear payload that the F-35A aircraft would carry, nor did it mention infrastructure needed to support the nuclear mission, including the storage location of the weapons. Neither did it mention nuclear custody or command-and-control arrangements, nor even basic information such as when the aircraft are intended to be delivered and when their nuclear capability is intended to be operational. Significantly, it said nothing about the possibility in due course of the UK developing its own sovereign theatre nuclear weapon capability.

3. The Strategic Defence Review

The government's Strategic Defence Review (SDR) was published on 2 June 2025, three weeks before the NATO Summit and the government's F-35A announcement. On the eve of the publication of the Review, the 'Sunday Times' newspaper ran a front page story with the headline 'British fighter jets to carry nuclear bombs'.[19] The story, planted by press officers in the MoD, stated that the UK was looking at procuring F-35A aircraft. While being careful to point out that the Strategic Defence Review did not commit specifically to air-launched nuclear capabilities for the RAF, the article claimed that discussions had taken place with the Pentagon on the issue. Prime Minister Keir Starmer, Defence Secretary John Healey, Chief of Defence Staff Admiral Tony Radakin, and former Cabinet Secretary Simon Case were all said to have thrown their support behind the proposal. The story was immediately picked up by other media outlets and dominated news reporting about the SDR. In the weeks before the SDR was published various news and blog articles from military think-tanks and commentators on nuclear issues had also trailed the suggestion that the SDR should recommend the re-instatement of a theatre nuclear weapons capability for the UK's military forces.[20]

Although news headlines about the SDR majored on the possible purchase of F-35As equipped for US B61 bombs, the SDR document itself had virtually nothing to say on this topic. The Review document merely stated that more F-35s will be required over the next decade, and that "this could comprise a mix of F-35A and B models according to military requirements".[21] The MoD "should commence discussions with the United States and NATO on the potential benefits and feasibility of enhanced UK participation in NATO's nuclear mission".[22]

At an evidence session shortly after publication of the SDR the House of Commons Defence Committee explored the review team's views on UK participation in the NATO nuclear mission. The review's authors downplayed the idea of UK participation in the mission and emphasised that the option still needed a detailed study.

An F-35B aircraft emerging from a hardened aircraft shelter at RAF Marham, August 2025.

Lord Robertson, former Defence Secretary and lead reviewer for the SDR, confirmed that the issue had been considered by the team and explained why it had not been included as a recommendation. "Yes, we considered it", he said. "The fact that it's not there indicates that we weren't terribly enthusiastic about it." He explained that when he was Defence Secretary between 1997 and 1999 he had "got rid of the free-fall bombs", and pointed out that although the NATO dual-capable aircraft arrangement was "symbolically important because it ties people into the American nuclear umbrella", there were "a number of practical issues that might be concerned about the United

CREDIT: MINISTRY OF DEFENCE

Kingdom". Robertson stressed that the SDR "simply says we should have a discussion about that gap" between strategic nuclear deterrence and conventional weapons, and said that another option for bridging the gap could be long-range heavy strike weapons. There were "other reasons for buying the A version of the F-35 beyond that of carrying nuclear weapons", he concluded.[23]

Robertson's caution was echoed by Dr Fiona Hill, another author of the SDR report. Dr Hill flagged up questions about the US's future nuclear posture as an area of uncertainty. "Just to be frank, this is actually, again, one of the reasons that we didn't recommend it," she said. "Partly because of that uncertainty, we opted not to make any major determinations about this". She noted that within NATO there are "other allies who already have dual capable aircraft and have tactical nuclear weapons as part of their arsenal", and at as a nuclear-armed state the UK already played a "unique role" within NATO.[24]

The lukewarm endorsement given during the evidence session suggests that the SDR team was sceptical about introducing a new element to the UK's nuclear posture. Robertson has since said that the government "have made a decision independent of the Review" to participate in the NATO nuclear sharing project.[25] The initiative is apparently being driven forward by the nuclear lobby within MoD itself, and raises questions about whether the decision was driven by strategic necessity or political expediency. The decision to join the NATO mission appears to have been made before the SDR was even published: the three-week gap between publication of the review and the NATO summit seems highly unlikely to have been adequate for the sensitive discussions and deliberation advocated by the SDR team.

4. The 2025 NATO Summit

CREDIT: NIK HOWE / UK MINISTRY OF DEFENCE

United States Air Force F-35A jets visit RAF Marham in September 2024.

The timing of the government's announcement on joining the NATO nuclear mission – to coincide with the 2025 NATO Summit – has fuelled speculation that it was influenced by a desire to bolster solidarity within the alliance, particularly in the light of US President Donald Trump's perceived lack of commitment to NATO and concerns that NATO's European members are not contributing enough to NATO. Writing in the Observer newspaper, former Chief of Defence Materiel at the Ministry of Defence, Bernard Gray, pointed out that "If money were no object, we could view the £2bn price tag for doing this as a Thank You to Uncle Sam. The UK is, in effect, picking up part of the cost of a mission that would otherwise fall to the US. In a world that wants to please President Trump, it's easy to see how it plays well to buy aircraft primarily built in Texas."[26]

The purchase serves more as an diplomatic gesture than a military imperative, given that it replicates capabilities already provided by other European NATO members and adds little to them. Paul Ingram of Cambridge University's Centre for the Study of Existential Risk has noted that the UK's joining the NATO nuclear mission amounts to "little more than a diplomatic signal" when the UK already fields its Trident nuclear weapons system, and questions whether the announcement is "really just another Starmer expression of flattery and subservience to Donald Trump?"[27] The decision thus reflects a long-standing trend by the UK government to prioritising trans-Atlantic politics over genuine military needs, providing Starmer with an opportunity to appease Trump and 'put something on the table' to smooth the waters at a potentially contentious NATO summit.

5. Practicalities of implementing the decision

Before the UK is able to join the NATO nuclear mission decisions will need to be made on a number of practical matters. To date the government has given no indication of how these will be addressed. This section of the briefing discusses some of these practicalities and the underlying issues which will need to be resolved.

Aircraft procurement and delivery

The MoD's F-35 programme is a long-term programme extending into the 2050s, to purchase and operate 138 F-35 aircraft. The aircraft are to be delivered in a series of batches, and to date 38 have been delivered to the RAF. A recent report on the F-35 programme by the National Audit Office (NAO) highlighted affordability challenges and delays in the delivery of aircraft and key infrastructure. The NAO concluded that the capability achieved for the estimated £11 billion spent to date was "a disappointing return so far compared with MoD plans", even if other programme benefits had been significant.[28]

The government has framed the purchase of F-35A aircraft as a cost-saving measure, claiming that procurement of 12 F-35A rather than 12 F-35B aircraft will deliver a saving of 'up to 25% per aircraft'.[29] The costs to the US military of the latest batch of F-35A jets are reported to be $82.5 million (£61.5 million) per aircraft, as opposed to $109 million (£81 million) for the F-35B.[30] However, this can only be considered as a general indicator of the costs which would be paid by the UK government, as aircraft specifications and contract details will vary from those agreed with the US government.[31]

The purchase costs of an aircraft are not the only cost associated with it, as there are costs involved in maintaining it and flying it over the course of its life. The US Congressional Budget Office office gives a figure of around $40,000 per flying hour for operating and support costs for an F-35 aircraft.[32] Over the lifetime of an aircraft these costs can be substantial. Based on pessimistic estimates by the MoD, the NAO has assessed that the whole-life procurement and operating costs of the planned UK fleet of 138 F-35 aircraft will total £71 billion, averaging out as around £0.5 billion to buy and fly each aircraft.

It will take time for the new aircraft to be delivered and enter into service. The government has set a target for 2033 for the delivery of the second procurement phase of its F-35 programme (12 F-35As and 15 F-35Bs),[33] and the Secretary of State for Defence has stated that he expects the F-35As "to start being delivered before the end of the decade".[34] Even if there are no delays in delivery, it will be years, rather than months, before they are available for operation.

In addition to being cheaper to purchase than the F-35B, the F-35A variant is also estimated to be 8% less expensive to operate than the F-35B, offering short-term savings. However, critics have pointed to the extra costs associated with acquiring a different variant of the F-35. The MoD originally sought to maintain a commonality within the F-35 fleet by buying a single variant to simplify logistics and maintenance. Operating multiple variants may increase costs and complexity, resulting in longer term lifecycle costs to set against short term procurement advantages.

Aircraft availability

The government has committed to buy twelve F-35A aircraft by 2033, and has remained silent on whether it may buy any further F-35As after this date. Although the MoD wishes to purchase twelve of the aircraft, this does not mean that twelve aircraft will always be available and ready to take part in a nuclear attack. Aircraft availability depends upon maintenance needs, and modern military aircraft have complicated airframes and engines and sophisticated software which have extensive maintenance requirements.

To date the F-35 does not have a good track record in this respect. According to the NAO, the MoD is delivering F-35 availability "far below its targets".[35]

In 2024 the UK F-35 fleet had a mission capable rate (the ability of an aircraft to perform at least one of its required missions) which was approximately half of the MoD's target. It had a full mission capable rate, (the ability to perform all its required missions) which was approximately one-third of the MoD's target. The MoD's targets are themselves lower than targets for the global F-35 programme. The poor availability rates are caused mainly by a UK shortage of F-35 engineers and a global shortage of F-35 spare parts.[36]

Although the NAO did not disclose actual availability percentages, for US military forces since 2022 fleetwide availability of F-35s has been in the range of 50 to 60 percent.[37] This is lower than the program's target availability rate of 65 percent. For the F-35A, full mission availability averaged approximately 40% over the period 2018-2024 (considerably higher than for F-35Bs).[38] However, aircraft availability dropped with age, declining from around 70% for a new F-35A aircraft to around 45% for a seven year old aircraft.[39]

This has important implications for the UK's role in the NATO nuclear mission. On the basis of current performance, at any one time at best only 8 aircraft would be available to take part in a nuclear strike – and possibly even fewer. It is possible that not all of these aircraft would penetrate enemy air defences to reach their targets. This raises questions about the credibility of the UK's role in contributing to the NATO nuclear mission in any meaningful way.

Operational dependencies

Critics of the UK's decision to take part in NATO's nuclear mission point out that the B61 nuclear weapons which are core to the mission remain under US control, rendering the operation entirely dependent on American permission. In this respect, the UK's participation in the mission does little to strengthen European security as it does not reduce reliance on a US 'nuclear guarantee'. In the unlikely event of a breakdown in the US-UK relationship, the US could even remove the bombs entirely from the UK. The F-35 itself is an American aircraft platform, and is also reliant on US support for its operation. In extremely unusual circumstances the US could conceivably withhold spare parts from the UK, meaning that aircraft would cease to be airworthy in a matter of months. To remain effective in combat the F-35 requires occasional software updates from the US. The US maintains tight control over F-35 aircraft systems, and foreign operators are not permitted to test or modify the aircraft independently. Certain sensitive test and maintenance functions can only be conducted by US citizens in order to protect US technology.[40]

The use of B61 nuclear weapons during a war in Europe would require the authorisation of Nato's Nuclear Planning Group and the US President and British Prime Minister – a potentially cumbersome arrangement requiring the consent of a number of different governments.[41] There is no guarantee that the US would release the weapons, particularly as such a move could result in nuclear retaliation against the US itself. Defence Minister Lord Coaker explained the authorisation agreements for the weapons during a debate in the House of Lords shortly after the announcement that the UK intended to join the NATO nuclear mission, stating that for the capability to be used for a nuclear mission, "it will require the agreement through the nuclear planning group of the United Kingdom Prime Minister". Coaker conceded that "Of course, that means that the authorisation of the use of those missiles remains US-controlled, because, in the same way that we control our UK nuclear weapons, US nuclear weapons remain subject to US approval".[42]

Historically, the RAF has been granted operational use of nuclear weapons held by US forces under the terms of Project E. In the case of the RAF's V-bombers, US custody of nuclear weapons created operational problems. The procedure for handing over the bombs added an extra ten minutes to the bombers' reaction time, and the requirement that US personnel had guardianship of the weapons at all times meant that neither they nor the bombers could be relocated to

dispersal airfields (airfields away from the home base where aircraft were at less risk of attack).[43] This raises questions about how effective and usable B61 bombs would be in a fast-moving war.

Use of NATO nuclear weapons depends on other factors beyond the UK's control. The combat radius of the F-35A aircraft (the maximum distance the aircraft can travel from its base to complete its mission and return without refuelling) is 1,100 kilometres.[44] This is inadequate even to reach the Russian enclave of Kaliningrad on the Baltic Sea from the aircraft's intended home base at RAF Marham, let alone any targets outside NATO territory further to the East. Even at the full extent of the aircraft's range, 2,200 km, on a one-way mission from which the pilot would not return, the aircraft would only be able to attack targets in Belarus and a small sector of western Russia beyond NATO borders. This means that for the aircraft to be able to operate effectively, it would need to fly from a temporary forward base in another NATO state closer to Russia or be refuelled in flight.

We have already seen that forward deployment raises difficulties in terms of relocating nuclear weapons and their US custodians. In-flight refuelling also presents challenges, because the 'Voyager' Airbus A330 Multi Role Tanker Transport aircraft operated by the RAF as refuelling tankers have a 'probe and drogue' refuelling system which is incompatible with the rigid boom system which is required for refuelling the F-35A. In due course the Voyager could be retrofitted with a boom, but in the meantime UK F-35A aircraft would not be able to refuel from RAF aircraft and would depend on tankers from other NATO countries, most likely the US, to refuel.[45] Again, these issues of range and strategic utility raise questions about the value that the UK's contribution can realistically add to the NATO nuclear mission.

CREDIT: APPLE MAPS

Satellite imagery of RAF Marham showing hardened aircraft shelters.

Basing

Although the government's statement on joining the NATO nuclear mission confirmed that the twelve F-35A aircraft that are being purchased for the RAF will be based at RAF Marham in Norfolk, nothing was said about whether B61 nuclear weapons would also be stored at Marham. This point was left open.

Marham would be an obvious potential location for basing the weapons. During the Cold War RAF WE177 theatre nuclear weapons were stored at Marham and RAF Honington in Suffolk. Both bases were also used as temporary secure storage sites for Royal Navy Chevaline warheads awaiting decommissioning at the end of the 1990s. However, neither site is currently believed to be certified to the necessary security standards mandated for nuclear weapons storage.

Satellite imagery of the Marham site shows a number of hardened aircraft shelters intended to protect aircraft against a nuclear blast. It is not known whether these are currently in use, but if not it is likely they could be refurbished to the appropriate standard with limited effort. Shelters intended for storing nuclear bombs would need to be equipped at some cost with a Weapons Storage and Security System (WS3), which is a secure storage frame for the bomb situated in a vault located in the floor of the shelter. The system can be easily raised and lowered allowing a bomb to

be quickly loaded onto an aircraft inside the shelter without being vulnerable to surveillance or attack. Other security features such as perimeter fencing would probably also need upgrading.

However, there would be little sense in locating a US security force at RAF Marham to hold US nuclear weapons in custody there when US B61 nuclear bombs are probably already stored securely at Lakenheath US base, barely 30 kilometres away from Marham. Another option, therefore, would be to fly the F-35A aircraft from Marham but store the B61 bombs at Lakenheath, where the RAF jets could load up with them during a crisis. From a US perspective, this option would have the advantage of consolidating US control over the weapons. This 'fly and collect' approach could apply to any NATO base at which dual capable aircraft and B61 bombs are located. MoD and US Air Force planners are doubtlessly weighing up the pros and cons of the different options before coming to a decision on where nuclear weapons for the UK's F-35As should be stored.

Certification

Air squadrons contributing to the NATO nuclear mission are required to meet rigorous certification standards before the US Air Force considers them competent to operate with nuclear weapons. This applies to both US Air Force units and European air forces which contribute to the NATO mission. The certification process can be a lengthy programme extending over many months. The RAF has not operated nuclear-capable aircraft since the 1990s, and in the words of Justin Bronk, senior research fellow for air power and technology at the Royal United Services Institute, it will take time for the RAF "to get back in the nuclear game".[46] This represents another element of uncertainty in the time-line for when the UK's contribution to the NATO nuclear mission will finally take to the air.

Certification covers a wide range of factors and the unit applying for certification has to show it can operate with nuclear weapons safely and effectively in all aspects of its work. Areas which are covered by certification include:

- Pilot training, including tactics, techniques, and procedures; weapons handling; and nuclear safety.
- Base security.
- Aircraft and equipment maintenance.
- Nuclear safety and emergency arrangements.
- Mission planning and co-ordination.
- Communications, command, and control and NATO command integration.

Personnel, aircraft, equipment and infrastructure all have to meet the necessary standards, and training, exercises and evaluation directed by the US Air Force take place on a regular basis. The certification task is likely to be simpler if just pilots and aircraft are required to meet certification standards – as might be adequate for the 'fly and collect' approach – rather than operations across the whole base if nuclear weapons are stored there.

Although the RAF has operated with a nuclear capability in the past, it will need to work with NATO and the US Air Force to devise a whole new nuclear doctrine and operating procedures. This will differ from current UK nuclear weapons protocols in some important respects – for example, the 'two person rule', requiring the presence of two or more authorised people at all stages of the nuclear operations chain to prevent malicious actions, cannot be applied to the single seater F-35 aircraft.[47]

The RAF has worked closely with the US Air Force to introduce new capabilities on previous occasions, for example when developing Reaper drone capabilities.[48] This programme began with an extensive period of joint working, with RAF aircrew embedded in US drone units. RAF personnel have been embedded within the air forces of other nations for decades, and it is likely that a very small number of RAF pilots are already embedded within nuclear certified units of the US Air Force.

Other roles for the RAF F-35 aircraft

As well as its nuclear strike role, the RAF intends to use F-35A aircraft for other purposes. On a day-to-day basis the F-35As will be used as training aircraft for 207 Squadron, the 'Operational Conversion Unit' at Marham which teaches pilots how to fly the F-35, use its weapons, and learn combat tactics. The intention is to increase aircraft availability for pilot training through the F-35A's reduced maintenance requirements and the increased airborne training time resulting from its longer range.[49]

In fact, the training role is intended as the F-35A's principal role, not the nuclear strike role. During a discussion about the aircraft at a meeting of the House of Commons Defence Committee one of the committee members, Calvin Bailey, described the F35A as "a training aircraft with benefits" – a view with which General Dame Sharon Nesmith, Vice-Chief of the Defence Staff, eagerly agreed.[50]

Assigning the F-35A jets to both a training role and a nuclear strike role raises doubts about operational nuclear readiness. During a sudden crisis, will the aircraft be available to take on their nuclear role at short notice? How will pilots trained for the nuclear role maintain the additional expertise needed for the role and their nuclear certification if F-35A flying hours have been allocated to training new pilots? Critics have described the decision as "muddled", adding to uncertainty about the feasibility of the nuclear mission.[51]

There are also questions about whether the F-35As will be armed with UK conventional weapons common to F-35Bs as well as being able to fly with the B61 nuclear payload. Trainee pilots will need to become familiar with the F-35's standard weapons package, although the F-35A is less likely to fly in a conventional combat role because of in-flight refuelling limitations.

Closing thoughts

In a study on the denuclearisation of the RAF following withdrawal of the UK's WE177 nuclear weapon Nick Ritchie and John Walker point out that "an effective military operational capability is more than just soldiers and guns" and set out the essential requirements for an operating framework for RAF nuclear weapons. They conclude that the time, effort and cost of restoring the activities, equipment, and infrastructure which comprise this framework to "even minimum operational levels" would be considerable and by no means trivial. During the Cold War it took the UK many years to develop the 'system of systems' needed to support air-delivered nuclear weapons, and "re-nuclearising the RAF and re-constituting an RAF nuclear ecosystem would be extremely challenging".[52]

Despite the government's optimistic framing, UK participation in NATO's nuclear mission faces significant practical hurdles. There will be challenges in maintaining aircraft availability and meeting the substantial training and certification requirements, which will be compounded by the decision to allocate F-35A aircraft to a day-to-day training role. Questions about infrastructure, basing, and nuclear storage arrangements remain unanswered, and the whole operation is absolutely dependent on US co-operation and participation. Hard questions need to be answered about whether UK participation in the system would provide a meaningful additional capability over that already provided by other NATO allies. It is not surprising that a sceptical SDR team shied away from recommending UK participation in the NATO nuclear mission. Why, then, has the government decided to go down this path? We will examine this question in the next section.

6. Reasons for joining the NATO nuclear mission

CREDIT: US AIR FORCE

An unarmed B61-12 test bomb unit during a US Air Force trial of the weapon in 2023.

The government has justified the F-35A aircraft purchase on three main grounds: strengthening NATO nuclear deterrence by contributing to the NATO nuclear mission; filling a 'capability gap' by providing a nuclear option which bridges the gap between conventional strikes and full-scale Trident retaliation; and cost efficiency, as the F-35A is cheaper than the F-35B. In this section of the briefing we will explore these and other motivations in more depth, and question whether the proposal meets cogent strategic aims or is just smoke and mirrors intended to provide political cover.

Cost efficiency

As discussed above, an F-35A jet is likely to cost the MoD in the order of £61.5 million as opposed to £81 million for an F-35B. This represents a saving of around £20 million per aircraft, or up to £240 million for twelve aircraft. This makes sense in the context of substituting F-35B aircraft with F-35A aircraft for pilot training purposes, as there are advantages in using the F-35A in this role. However, in terms of the nuclear mission it can be argued that the twelve aircraft assigned to this role are twelve aircraft less available for the 'standard' RAF F-35 role, capable of flying from aircraft carriers and used in conventional strike roles. From this viewpoint the measure is not a saving but substitution for a different purpose.

Role in nuclear deterrence

NATO describes its dual capable aircraft nuclear capability as "central to NATO's nuclear deterrence mission". The nuclear sharing arrangements "play a vital role in the interconnection of the Alliance and remain one of the main components of security guarantees and the indivisibility of security of the whole Euro-Atlantic area".[53]

Bernard Gray has described this arrangement as ensuring that "European hands are dipped in the blood of any decision to use nuclear weapons defending Europe" by giving European NATO members a role in any nuclear attack undertaken by the alliance. Although the B61 nuclear bombs based in Europe are

"very firmly under US control and would only ever be used as and when the US wanted", the US is keen to ensure that it would not be seen as solely responsible for the use of nuclear weapons in a European war.[54]

The difficulty comes in seeing what role the UK plays in this. Despite talk by politicians and newspapers of an 'independent deterrent', the UK's Trident nuclear weapons system is in reality committed at all times to NATO use,[55] and the UK already pulls its weight in terms of contributing to NATO's nuclear capability. According to NATO, the strategic nuclear forces of the United Kingdom and France "have a deterrent role of their own and contribute significantly to the overall security of the Alliance".[56]

Vice Chief of Defence Staff General Dame Sharon Nesmith has told the House of Commons Defence Committee that "the reason we would want to invest in the tactical nuclear capability is so that we are making NATO more lethal".[57] As we have seen in the previous section, the UK would be contributing the absolute bare minimum to the NATO dual capable aircraft mission, and this contribution would add little to the 'lethality' of the force. France's air-delivered nuclear capabilities, which are outlined in an Appendix to the briefing for the purposes of comparison, operate on a far more substantial scale than the UK's proposed commitment to NATO and represent a far more lethal and credible deterrent.

Russia is, of course, aware of NATO's ability to launch an air attack on its forces and has taken steps to prevent this, including the development of extensive air defences. Although the F-35 has a stealth capability, the capability of these defences will improve as radar technology develops in the future, and some sources consider that it is only a matter of time until radar systems able to track latest-generation stealth aircraft are deployed. In blunt terms, there is no guarantee that a NATO mission to fly F-35 aircraft into Russian territory to deliver free-fall nuclear bombs will succeed.[58]

If the UK seriously wants to contribute to the 'lethality' and deterrence posture of NATO, there may be more effective ways of doing this. Lord Robertson told the House of Commons Defence Committee that long-range heavy strike weapons could be an alternative to theatre nuclear weapons for filling any perceived capability gap between strategic nuclear deterrence and conventional weapons. Such weapons, based around missiles, drones, or other technologies launched from a mobile platform, can create strategic-level military effects and subdue enemies during wartime. An analysis of China's conventional missile arsenal and doctrine suggests that Chinese military leaders believe that employing these weapons for long range strikes could be an effective way of achieving the same functions as strategic weapons.[59] The MoD has announced that it plans to develop long range strike weapons in partnership with Germany for just such purposes.[60] The United Kingdom should therefore carefully evaluate whether theatre nuclear weapons are at all necessary, and whether conventional capabilities might be more effective at meeting the aims they are intended to achieve.

A UK theatre nuclear capability

In the weeks before the SDR was published news and blog articles by various military commentators advocated that the review should recommend the re-instatement of a UK theatre nuclear weapons capability, and that this should take the form of an independent capability based on a UK-designed warhead and missile platform. Clearly, development of such a capability would take time, but participation in the NATO nuclear mission might be seen as a first step in paving the way politically for such a programme.

The government considered this possibility in 2013 when reviewing potential alternative options to the Trident submarine launched ballistic missile system. The Trident Alternatives Review, undertaken by the Cameron government, considered the costs and feasibility of a number of potential nuclear delivery systems, including development of systems based

around stealthy cruise missiles, supersonic cruise missiles, and free-fall bombs delivered by the F-35 aircraft.[61]

The assessment showed that design and development of the warhead and its integration into a cruise missile or bomb would be "the critical challenge". The UK nuclear warhead programme is highly optimised around producing and maintaining warheads for the Trident missile, and is currently engaged in developing a new warhead for the missile. Moving to an alternative would add technical, financial and schedule risk to the programme. Government experts who undertook the review judged that a warhead capability integrated into a cruise missile might be delivered within 24 years.[62] The cost of the programme over its lifetime, including warhead, missile, aircraft, infrastructure, and policy change costs, would approximate £15 billion at 2013 prices[63]. The main cost driver was found to be the cost of developing a new warhead, which at £8 billion for a free-fall bomb and £10 billion for a cruise missile, was described in the review as "very considerable".[64] Interestingly, the option considered that the number of F-35 aircraft needed to deliver a credible deterrent force was 36 aircraft (roughly comparable to the number of aircraft employed by France to undertake a similar role – see Appendix) – three times more than the MoD plans to buy to take part in the NATO nuclear mission.

Spending on new nuclear weapon capabilities comes with considerable financial, political, and diplomatic costs and risks. It is for these very good reasons that the SDR team sensibly did not mention development of an independent UK theatre nuclear weapons capability, and the Secretary of State for Defence described it as "not something that would necessarily be consistent with my ambition or the manifesto commitment that we made at the heart of the strategic defence review".[65]

At a time when public services are struggling to meet demands, there is little public appetite for more military spending.[66] An expensive nuclear weapon system that will not be available for nearly a quarter of a century is a low priority, even on the UK military's wish list – if, indeed, such a capability is even needed. However, it is likely that pro-nuclear advocates will use the decision to purchase F-35As and participate in NATO nuclear sharing to create an expectation that the UK should in due course develop its own theatre nuclear weapons. This would be an unaffordable, distracting, and futile enterprise which should be resisted at all costs.

Political considerations

Political considerations, both domestic and international, are a factor in any government decision, and have been particularly salient in the UK's decision to buy F-35A aircraft.

Although the UK has nothing to prove in terms of its nuclear contribution to NATO, the politics of the alliance appear to have been an important factor in the substance and timing of the announcement about joining the NATO nuclear mission. In the light of US concerns that European NATO nations need to contribute more to the alliance, regularly articulated by the Trump administration, the decision is clearly intended to show that the UK is willing to meet this challenge. Defence Secretary John Healey has said that the move is a way that the UK can "step up and play a stronger role within NATO" and "develop and demonstrate, as we are, a stronger leadership within NATO". Healey said that the UK's proposal had been "warmly welcomed by the NATO General Secretary, by NATO allies and by the US".[67] It can be seen as a means of allowing Prime Minister Keir Starmer to present himself at the NATO summit as a statesman, dealmaker, and ally to the US by putting something on the table to appease Trump and demonstrate that Europe is committed to paying its way.

On the home front, the proposal will also be seen by Ministers as a way of buying political capital for the government among tabloid newspapers and older, right-of-centre voters. Inter-service rivalries within

the military may also have played a role behind the scenes, with the RAF gaining a nuclear strike capability and being able to push back to an extent against an F-35B procurement strategy which prioritises naval air operations.[68]

The view that political factors were an important motivation behind the F-35A purchase is reinforced by the perception that despite the MoD's media spin there is little of substance behind the announcement, and that it shows all the hallmarks of having been cobbled together to provide a 'quick win' by hitching a nuclear role onto an otherwise logical decision to use F-35A aircraft for training purposes.

Hedging against Trident vulnerabilities

There are growing concerns about the reliability of the UK's submarine-based nuclear weapons. The current fleet of Vanguard class submarines was built in the 1980s and 1990s and the most recently built, HMS Vengeance, was commissioned into service in 1999, more than 25 years ago. The submarines are now showing their age and as a result maintenance demands appear to be rising dramatically. This is resulting in longer and longer patrols at sea, which in turn further add to maintenance needs. The most recent patrol at the time of writing reportedly spent 204 days at sea, placing huge demands on both the crew and machinery on board the submarine. When the UK started nuclear armed submarine patrols with the previous generation of Resolution class submarines six weeks was considered normal for a patrol, and three months was considered an exceptionally long time for a submarine to be at sea.[69]

Clearly this situation is not sustainable. New Dreadnought class submarines are being built to replace the Vanguard class which is currently in service, but the in-service date for the new submarines has slipped. MoD will not give a specific date for when they are intended to be at sea, saying only that they will be in service in the 'mid 2030s'.[70]

The Royal Navy therefore faces an absolutely Herculean challenge over the next ten years in keeping ageing submarines at sea to maintain the UK's policy of always having one nuclear-armed submarine at sea. There is a risk that at some point they may be unable to continue doing this, representing a substantial blow to the credibility of the UK's nuclear weapons programme.

Although the government's decision to purchase nuclear-capable F-35A aircraft poses a number of contradictions and questions, it makes some sense in the context of a political hedge against the possibility of an acute failure in the Trident programme which prevented the constant at-sea patrol cycle from being continued. The aircraft would be no substitute for submarine-based nuclear weapons by any measure, and would not fool potential enemies that the UK remained a credible nuclear power, but along with recently announced arrangements for co-operating and co-ordinating on nuclear matters with France[71] they might just be able to cover as a fig leaf to persuade an uninformed public that the UK still counted as a nuclear-armed state.

In the context of waning government confidence in the Trident system, the F-35A procurement could be seen as an 'insurance policy' to help paper over the cracks.[72] Nevertheless, there will still be challenges: given that the F-35A nuclear capability may not be available until the mid 2030s, it will be a close race to see whether it is available before the first Dreadnought class submarine.

7. Implications for UK nuclear weapons policy

As well as concerns about operational vulnerability, lack of independence, and the practicalities of deploying F-35A aircraft in a NATO nuclear role which are outlined above, there are other reasons why the initiative might be contrary to the UK's interests.

Disarmament and non-proliferation implications

The UK is a signatory and depository state of the international Non-Proliferation Treaty (NPT) and has always claimed to be committed to its obligations under the treaty, including obligations under Article VI of the treaty relating to negotiations on nuclear disarmament. The government announcement that the UK planned to buy F-35A aircraft and join NATO's nuclear mission included the statement: "The UK remains committed to the goal of a world without nuclear weapons and upholds all our obligations under the NPT".[73]

Articles I and II of the NPT commit states not to transfer or receive, respectively, nuclear weapons, or other nuclear explosive devices from any source. As long as the US retains ownership, authority, and custody over B61 bombs that are deployed in Europe then these provisions could be considered to hold for NATO's nuclear sharing programme. In fact, these articles of the Treaty were originally written jointly by the US and the Soviet Union to satisfy NATO's existing nuclear sharing arrangements. Despite this, over the past decade Russia has accused the US and its NATO allies of being in violation of Articles I and II of the NPT, even while recently saying that it is itself transferring nuclear-capable delivery systems to Belarus and has deployed Russian nuclear weapons in Belarus.[74] It is harder to see how the US and NATO states would remain in compliance with Article I and II during wartime if a decision had been made to release B61 bombs to European nations for a nuclear strike.

There has been long-standing debate about to what exactly Article VI of the NPT does or does not commit parties, particularly nuclear-weapon states, with regard to nuclear disarmament. Without taking a position in this debate, it is clear that the UK's decision to take part in the NATO nuclear mission will be seen as inconsistent with Article VI by those who have been critical of the disarmament record of the UK and other nuclear-armed states to date.

Perhaps more important are the terms of the agreement under which the NPT was extended indefinitely in 2000, which include practical measures for implementing Article VI known as the '13 Steps'. One of these steps is for "the principle of irreversibility to apply to nuclear disarmament, nuclear and other related arms control and reduction measures". This means that, once renounced, a nuclear capability should not be regained. The UK has already reversed a commitment in the 2010 defence review to reduce the number of its warheads, and now plans to reverse the steps taken in the 1990s to abandon its theatre nuclear weapons capability and denuclearise the RAF. Speaking on this point, former Defence Secretary Lord Des Browne has said "It's a matter of some concern to me that 25 years later it is a Labour government that is set on re-acquiring this capability in the UK".[75]

The NPT 13 Steps also commit states to "the further reduction of non-strategic nuclear weapons, based on unilateral initiatives and as an integral part of the nuclear arms reduction and disarmament process", and "a diminishing role for nuclear weapons in security policies to minimize the risk that these weapons ever be used and to facilitate the process of their total elimination". In these respects, too, the UK is breaching both the spirit and the letter of the 13 Steps. The UK government can therefore expect to receive criticism at future NPT review conferences from many non-nuclear-weapons states and civil society for its decision to join the NATO nuclear mission despite previous international commitments that it has made.

Use of nuclear weapons during wartime

Throughout this study we have used the term 'theatre nuclear weapons' to describe the B61 bombs which arm NATO's nuclear mission. 'Theatre', or 'tactical', nuclear weapon is a term used to indicate that the weapon is designed to be used on a battlefield. In reality, as Lord Browne has pointed out, "No nuclear weapon is anything but strategic. There is no such thing as a tactical nuclear weapon".[76] The consequences of any use of a nuclear weapon under any circumstances would be grave, probably resulting in major humanitarian implications, and it is highly likely that any use of a nuclear weapon would breach international humanitarian law and the laws of armed conflict.

This is because even small 'theatre' nuclear weapons are extremely powerful and devastating in their effects. The US B61-12 nuclear bomb, which the RAF's F-35A aircraft are intended to deliver, is designed to have four selectable explosive yields: 0.3 kilotons (kt), 1.5 kt, 10 kt and 50 kt.[77] In comparison, the atomic bomb which devastated the Japanese city of Hiroshima in August 1945 had an explosive power of 15 kt – similar to the mid-range yield selection for the B61-12. The Hiroshima bomb killed 140,000 people by the end of 1945, destroyed virtually everything within a mile of the point directly under the explosion, and caused a

CREDIT: ALEX WELLERSTEIN / NUKEMAP

Nuclear weapon effects of a B61 bomb surface detonation at the Houses of Parliament, London.

Key

Fireball radius
Heavy blast damage radius (20 psi)
Moderate blast damage radius (5 psi)

Radiation radius (500 rem)
Thermal radiation radius (third degree burns)
Light blast damage radius (1 psi)

For full details please visit https://nuclearsecrecy.com/nukemap

firestorm roughly two miles in diameter. Radioactive materials contaminated land, water, and food supplies and resulted in health impacts which are still being experienced to this day.[78] Even detonation of the lowest-yield B61-12 bomb at an isolated military base would have major humanitarian, environmental, political, and legal consequences.[79]

The view that theatre nuclear weapons are useful military tools has been greeted with scepticism by Professor Sir Lawrence Freedman, one of the UK's foremost military strategists. Sir Lawrence advised the House of Commons Defence Committee in April 2025 that "using these weapons on the assumption you would not be escalating to longer-range and larger systems is probably, or possibly, unrealistic." He told MPs that "there are other things you can do to retaliate" and pointed out that planning for the eventuality of a Russian tactical nuclear attack during the Ukraine war "did not envisage a nuclear response by the allies". There are "lots of ways of hurting countries without actually having to use nuclear weapons yourself", he observed.[80]

Decisions made during US government wargames simulating war in Europe give an insight into the dilemmas involved in using theatre nuclear weapons during war. In his book 'The Bomb', national security writer Fred Kaplan describes wargames which took place towards the end of the Obama presidency to model a war in Europe against Russia.[81] It is worth considering the outcome of these exercises in some detail. Each game began with Russian forces attacking a Baltic nation and resorting to nuclear weapons when they found themselves overwhelmed by NATO's conventional counterattack (exactly the scenario postulated by those advocating a need for NATO theatre nuclear weapons). US decision-makers faced the question: what should they do next?

Different views were discussed, with some advocating a nuclear response in kind. Others took a wider view, arguing that such a situation would be a world-defining moment – the first time a nuclear weapon had been used since 1945. They pointed out that this would be an opportunity to rally the whole world against Russia, and that by responding only with conventional military and diplomatic measures it should be possible to isolate and weaken the Russian leadership and military. A nuclear response would throw away that advantage and, more worryingly, normalise the use of nuclear weapons and escalate the conflict. Instead, the whole world should be rallied against Russia, with an impact that would be more devastating than a tit-for-tat nuclear response.

Those arguing in favour of nuclear use faced some specific problems: notably, where to aim a nuclear response. One option was Russia's Baltic enclave of Kaliningrad, but this was part of Russia, and an attack on Kaliningrad might result in a Russian nuclear response targeted on the US. A nuclear attack on Russian forces as they moved into NATO territory would kill a large number of civilian NATO citizens. The decision finally made in one of the games was to undertake nuclear attacks on Belarus – even though, in the wargame, Belarus had played no role in Russia's attack on the Baltics or in the Russian nuclear strike. The move did nothing to win or end the war.

The exercises vividly demonstrate that tactical weapons do not provide any practical solutions in warfighting. If they are used in a war, then what will happen next? There is no way of knowing, and no guarantee that the enemy will respond in the way intended. The enemy is at least as likely to escalate the conflict and respond in kind with a further nuclear sally than to climb down. A nuclear weapon used in anger is likely to trigger a nuclear response, regardless of its size or how it is delivered, potentially increasing the likelihood of miscalculation and escalation. If, despite the use of theatre nuclear weapons in a war, the enemy responds in kind with another nuclear attack one key question will always need to be answered: What do we do next?

8. Conclusion

It is difficult to see consistent logic or any need for the UK to purchase F-35A aircraft and join NATO's nuclear mission from a practical military viewpoint. The decision has apparently been driven largely by political factors, and represents the use of political 'smoke and mirrors' to deceive the public and politicians from other NATO countries into thinking that the UK is taking a significant step to strengthen its nuclear forces when in reality it is doing next to nothing.

The idea that the further proliferation of theatre nuclear weapons is necessary or will make the world safer in any way is clearly absurd. When looked at objectively, they are merely a 'solution' looking for a problem. They are not needed as a military option, since more credible non-nuclear options are available, and it is hard to see how it would be feasible to use them in conflict without the risk of inviting a nuclear response in kind. The muddling of training and nuclear roles for RAF F-35A aircraft and US control over the nuclear weapons themselves raises other difficult questions. Under these circumstances, it is not surprising that the government has been shy about committing to an operational date or discussing practical details to explain how a UK contribution to NATO's theatre nuclear mission would operate. As yet there is no evidence that involvement in NATO's nuclear mission would have long term utility for the UK and is based on a coherent assessment of the country's military needs.

On the other hand, it serves the government's political agenda to talk up measures for supposedly strengthening its nuclear posture. Purchase of dual-capable F-35A aircraft serves to appease Donald Trump and those in his administration who are calling for a greater European commitment to NATO, acts as a sop to demonstrate the UK's commitment to NATO unity, and enables ministers to indulge in macho military posturing to play to conservative newspapers and voters. The aircraft may also be presented as a political fig-leaf and stop-gap in the event of UK Trident nuclear-armed submarines being unable to continue maintaining a continuous cycle of at-sea patrols.

The race by a small group of ministers to take forward plans to join the NATO nuclear mission despite the SDR's recommendations for a more cautious approach bears all the hallmarks of the worst traits in UK nuclear weapons decision-making, which over the decades has resulted in poorly conceived and executed programmes. The decision is untransparent, has not been properly justified, and fundamentally underestimates the challenges of re-establishing a nuclear capability in the RAF. It has no mandate with Parliament or the public and it is not clear what safeguards, if any, will be in place to ensure that money is spent well and waste avoided.

NATO nuclear-sharing is essentially symbolic and political, and so the UK's F-35A announcement is a perfect match for it. The announcement includes little of substance and represents smoke and mirrors intended to distract from what is really going on. The UK's involvement in NATO's nuclear mission will not add to its effectiveness or credibility in any meaningful way. The role has already been adopted by other NATO members who have been quietly carrying it on for many years. Any benefits, such as they are, from the decision to join will be reaped by politicians and arms traders and not by soldiers. In the same way that decisions of previous governments to invest in new nuclear weapons systems have precipitated worries and debate about their costs, benefits, and feasibility, perhaps this proposal will do likewise. It should do.

Appendix: France's airborne nuclear weapons capability

It is useful to compare the UK's planned contribution to the NATO nuclear mission with France's current airborne nuclear weapons capability.

France's nuclear forces are not assigned to NATO's integrated military command structure. As well as submarine-launched strategic nuclear weapons, France is currently estimated to have a stockpile of 50 tête nucléaire aéroportée (TNA) nuclear warheads for delivery by fighter bombers. These weapons would be delivered by the ASMPA (air-sol moyenne portée-amélioré) air-launched cruise missile and would be intended to deliver a nuclear 'warning shot'. The ASMPA missile has a range of up to 500 kilometers.[82]

France's Strategic Air Forces (Forces Aériennes Stratégiques) operate approximately 40 nuclear-capable Rafale BF3 aircraft, while the Naval Nuclear Aviation Force (Force Aéronavale Nucléaire or FANu) is able to operate 10 Rafale Marine (MF3) aircraft for nuclear strike missions from the aircraft carrier Charles de Gaulle. Each aircraft can carry a single nuclear-armed ASMPA missile. Aircraft assigned to France's nuclear mission also fly on conventional missions.

This helps to place the UK's intended contribution to the NATO nuclear mission into context. While the UK would probably have less than ten aircraft available to take part in a nuclear strike, France could have up to fifty. France's theatre nuclear force is independent, while the UK's is entirely under the control of the US. French nuclear-armed aircraft would be able to operate from an aircraft carrier, while the UK's would not, and the ASMPA missile gives them the ability to extend the range of the strike while remaining at some distance from the target, whereas UK aircraft would have to enter enemy airspace and approach close to the target to undertake a strike.

In terms of independence, numbers, flexibility, and penetrability, France's airborne nuclear capabilities are far superior than those planned by the UK government. They do, however, come at a cost. As military commentator Hamish de Bretton-Gordon points out, in choosing to contribute to NATO's nuclear mission "Starmer has gone for the cheapest option that was on the table".[83] This again raises questions about the effectiveness and credibility that the UK's contribution could make to the NATO mission.

Endnotes

1. https://assets.publishing.service.gov.uk/media/61d308ffe90e071971e25654/Joint_Statement_Of_the_Leaders_of_the_Five_Nuclear-Weapon_States_On_Preventing_Nuclear_War_and_Avoiding_Arms_Races.pdf. The original Reagan-Gorbachev declaration can be found at https://www.presidency.ucsb.edu/documents/joint-soviet-united-states-statement-the-summit-meeting-geneva
2. 'UK to purchase F-35As and join NATO nuclear mission as Government steps up national security and delivers defence dividend'. Prime Minister's Office, 24 June 2025. https://www.gov.uk/government/news/uk-to-purchase-f-35as-and-join-nato-nuclear-mission-as-government-steps-up-national-security-and-delivers-defence-dividend
3. For convenience, the term 'NATO dual capable aircraft nuclear mission' will be referred to as the 'NATO nuclear mission' for the remainder of this briefing, acknowledging that in reality NATO's nuclear mission covers a much broader scope than dual capable aircraft based in Europe.
4. Each F-35A aircraft is able to carry two B61 nuclear bombs.
5. The term 'theatre nuclear weapon' is used throughout the remainder of this briefing for convenience as it is commonly used to describe this type of nuclear weapon, acknowledging that in reality there is no practical difference between a 'theatre' and 'strategic' nuclear weapon. See section 7.2.
6. Eliana Johns & Hans Kristensen. 'Reawakening a Nuclear Legacy: The Potential Return of the US Nuclear Mission to RAF Lakenheath'. Federation of American Scientists, February 2025. P5. https://fas.org/wp-content/uploads/2025/02/JohnsKristensenFAS_LakenheathReport2025.pdf
7. Hans M. Kristensen, Matt Korda, Eliana Johns & Mackenzie Knight: 'Nuclear weapons sharing, 2023'. Bulletin of the Atomic Scientists, Volume 79(6), P393-406. 7 November 2023. https://www.tandfonline.com/doi/pdf/10.1080/00963402.2023.2266944
   For a history of the deployment of US nuclear weapons in Europe see Hans M. Kristensen: 'U.S. Nuclear Weapons in Europe: A Review of Post-Cold War Policy, Force Levels, and War Planning. Natural Resources Defense Council, February 2005. https://nukestrat.com/pubs/EuroBombs.pdf
8. Some sources claim that Turkish military forces do not have access to these weapons. Joseph Trevithick: 'U.S. Reviewing Options For Pulling Nuclear Bombs Out Of Turkey, Here's How They Might Do It'. The War Zone, 14 October 2019. https://www.twz.com/30417/u-s-reviewing-options-for-pulling-nuclear-bombs-out-of-turkey-heres-how-they-might-do-it
9. 'How the US Air Force brought nuclear weapons to Lakenheath air base: The inside story'. Nukewatch UK, 22 July 2025. https://www.nukewatch.org.uk/how-the-us-air-force-brought-nuclear-weapons-to-lakenheath-air-base-the-inside-story/
10. Hans M. Kristensen, Matt Korda, Eliana Johns & Mackenzie Knight: 'Nuclear weapons sharing, 2023', ibid.
11. Justin Bronk: 'Britain's 'Independent' V-Bomber Force and US Nuclear Weapons, 1957–1962'. Journal of Strategic Studies, Vol 37, P974-997. 10 May 2013. https://doi.org/10.1080/01402390.2013.770736
    'Project E'. Wikipedia. https://en.wikipedia.org/wiki/Project_E
12. John R. Walker: 'A History of the United Kingdom's WE 177 Nuclear Weapons Programme From Conception to Entry into Service 1959–1980'. BASIC, March 2019. https://basicint.org/wp-content/uploads/2019/08/A-History-of-the-UK-WE-177.pdf
13. Statement on the Defence Estimates. House of Commons Debate, 18 October 1993, c33-36. https://www.theyworkforyou.com/debates/?id=1993-10-18a.27.0
14. Geoffrey Chapman: 'Sub-Strategic Trident: Material Change or Mirage?'. Kings College London, February 2022.

15. Hans M. Kristensen, Matt Korda, Eliana Johns & Mackenzie Knight: 'United Kingdom Nuclear Weapons, 2024'. Bulletin of the Atomic Scientists Vol 80:6 P394-407. 12 November 2024. https://doi.org/10.1080/00963402.2024.2420550
16. 'UK to purchase F-35As and join NATO nuclear mission as Government steps up national security and delivers defence dividend', ibid.
17. 'The Strategic Defence Review 2025 – Making Britain Safer: secure at home, strong abroad'. Ministry of Defence, 2 June 2025. https://assets.publishing.service.gov.uk/media/683d89f181deb72cce2680a5/The_Strategic_Defence_Review_2025_-_Making_Britain_Safer_-_secure_at_home__strong_abroad.pdf
18. 'RAF F-35A marks a significant step in delivering a more lethal Integrated Force and joining NATO Nuclear Mission'. Royal Air Force, 25 June 2025. https://www.raf.mod.uk/news/articles/raf-f-35a-marks-a-significant-step-in-delivering-a-more-lethal-integrated-force-and-joining-nato-nuclear-mission/
19. Harry Yorke and Tom Newton Dunn: 'British fighter jets to carry nuclear bombs'. Sunday Times, 31 May 2025. https://www.thetimes.com/uk/defence/article/review-fighter-jets-nuclear-weapons-x9vldtosv
20. For example:
James Rogers and Marc De Vore: 'The case for a British sub-strategic nuclear deterrent'. Council on Geostrategy: Memorandum No. 15, 2025. 7 April 2025. https://www.britainsworld.org.uk/p/the-memorandum-15-2025
George Allison: 'UK matching Russia's tactical nukes would be 'difficult''. UK Defence Journal, 9 April 2025 https://ukdefencejournal.org.uk/uk-matching-russias-tactical-nukes-would-be-difficult/
George Allison: 'UK needs a sub-strategic nuclear deterrent argue experts'. UK Defence Journal, 10 April 2025. https://ukdefencejournal.org.uk/uk-needs-a-sub-strategic-nuclear-deterrent-argue-experts/
Hamish de Bretton-Gordon: 'How to deal with Putin: Go nuclear early'. Telegraph, 16 April 2025. https://www.telegraph.co.uk/news/2025/04/16/tactical-nuclear-weapons-uk-vital-against-putin-invasion/
Paul Mason, Marc De Vore and James Rogers: 'Why Britain must expand its nuclear arsenal'. Spectator, 10 May 2025. https://www.spectator.co.uk/article/why-britain-must-expand-its-nuclear-arsenal/
George Allison: 'Experts call for expansion of UK's nuclear arsenal'. UK Defence Journal, 10 May 2025. https://ukdefencejournal.org.uk/experts-call-for-expansion-of-uks-nuclear-arsenal/
21. 'The Strategic Defence Review 2025 – Making Britain Safer: secure at home, strong abroad', ibid. Paragraph 46, p115.
22. 'The Strategic Defence Review 2025 – Making Britain Safer: secure at home, strong abroad', ibid. Paragraph 27, P20.
23. 'Oral evidence: Strategic Defence Review'. House of Commons Defence Committee. HC 972, 11 June 2025. Q37-41. https://committees.parliament.uk/oralevidence/16048/pdf/
24. 'Oral evidence: Strategic Defence Review', ibid. Q42.
25. 'The Strategic Defence Review 2025: Reflections On The Method & Conclusions'. Global Strategy Forum, 7 July 2025. 42 min 40 sec. https://www.youtube.com/watch?v=u2lXNPXUEPo
26. Bernard Gray: 'Pleasing President Trump is poor value for Britain's £2bn'. Observer, 27 June 2025. https://observer.co.uk/news/opinion-and-ideas/article/pleasing-president-trump-is-poor-value-for-britains-2bn
27. Paul Ingram: 'Is Trident sunk? Britain's new fighter jets are no backup'. UnHerd, 27 June 2025. https://unherd.com/2025/06/is-trident-sunk/
28. 'The UK's F-35 capability'. National Audit Office, 11 July 2025. https://www.nao.org.uk/reports/the-uks-f-35-capability/
29. 'UK to purchase F-35As and join NATO nuclear mission as Government steps up national security and delivers defence dividend', ibid.
The Secretary of State for Defence has subsequently stated that he confidently expects that the cost of the F-35As will be "around 20% less" than the cost of the F-35Bs. 'Oral evidence: Strategic Defence Review'. House of Commons Defence Committee. HC 973 Wednesday 2 July 2025. Q18. https://committees.parliament.uk/oralevidence/16226/pdf/
30. 'Pentagon, Lockheed Martin Reach Agreement For Two More Lots Of F-35 Fighters'. Defense Mirror, 26 November 2024. https://www.defensemirror.com/news/38255/Pentagon__Lockheed_Martin_Reach_Agreement_for_Two_More_Lots_of_F_35_Fighters
31. F-35B costs to the UK at an earlier phase in the programme in 2020 were $115 million per aircraft. George Allison, 'Latest British F-35B cost sees '24% reduction' from first orders'. UK Defence Journal, 17 March 2020. https://ukdefencejournal.org.uk/latest-british-f-35b-cost-sees-24-reduction-from-first-orders/
32. At 2023 dollar costs. 'Availability, Use, and Operating and Support Costs of F-35 Fighter Aircraft'. Congressional Budget Office, June 2025. P6. https://www.cbo.gov/system/files/2025-06/61347-F-35-Availability.pdf
33. 'F35A and F35B Jets. House of Lords Question, 1 July 2025. https://www.theyworkforyou.com/lords/?id=2025-07-01b.594.4

34. ‘Oral evidence: Strategic Defence Review’. House of Commons Defence Committee. HC 973 Wednesday 2 July 2025, ibid. Q20.
35. ‘The UK’s F-35 capability’. National Audit Office, 11 July 2025. HC 989, 11 July 2025. Para 1.22, p24. https://www.nao.org.uk/wp-content/uploads/2025/07/the-uks-f-35-capability.pdf
36. ‘The UK’s F-35 capability’. National Audit Office, 11 July 2025. HC 989, ibid. Para 12, p8.
37. ‘Availability, Use, and Operating and Support Costs of F-35 Fighter Aircraft’. Congressional Budget Office, June 2025. P2. https://www.cbo.gov/system/files/2025-06/61347-F-35-Availability.pdf
38. ‘Availability, Use, and Operating and Support Costs of F-35 Fighter Aircraft’. Congressional Budget Office, ibid. P3.
39. ‘Availability, Use, and Operating and Support Costs of F-35 Fighter Aircraft’. Congressional Budget Office, ibid. P2.
40. David Cenciotti: ‘The F-35 ‘Kill Switch’: Separating Myth from Reality’. The Aviationist, 10 March 2025. https://theaviationist.com/2025/03/10/f-35-kill-switch-myth/
41. In the 1962 Athens Guidelines NATO allies acknowledged that possibilities for consultation would be likely to be “extremely limited” in the event of a nuclear crisis, but that the United States would work to consult with its NATO allies prior to nuclear release “if time permitted”. For more information see Hans M. Kristensen, Matt Korda, Eliana Johns & Mackenzie Knight: ‘Nuclear weapons sharing, 2023’. Bulletin of the Atomic Scientists, ibid.
42. ‘UK Weapons Systems’. Hansard V847 c592-3, 1 July 2025. https://hansard.parliament.uk/lords/2025-07-01/debates/EF615FD6-E20B-4374-816A-2329943D65DA/UKWeaponsSystems
43. Justin Bronk: ‘Britain’s ‘Independent’ V-Bomber Force and US Nuclear Weapons, 1957–1962’. Journal of Strategic Studies, ibid.
44. ‘RAF F-35A marks a significant step in delivering a more lethal Integrated Force and joining NATO Nuclear Mission’. Royal Air Force, ibid.
45. Kai Greet: ‘Nuclear Strike Mission Could Return to the RAF After 27-Year Gap’. The Aviationist, 1 July 2025. https://theaviationist.com/2025/06/01/nuclear-strike-mission-could-return-to-raf/
46. Gergana Krasteva: ‘Britain to buy 12 nuclear-carrying F-35A warplanes worth £700,000,000’. Metro, 25 June 2025. https://metro.co.uk/2025/06/25/britain-buy-12-nuclear-carrying-f-35a-warplanes-worth-700-000-000-23499871/
47. The two person rule is believed to apply to all personnel throughout the UK’s nuclear weapons command chain from the Prime Minister onwards. Although most RAF nuclear capable aircraft have historically been flown by a crew of two, a small number of aircraft types, for example the SEPECAT Jaguar, have been operated by a single pilot.
48. ‘Joint Enterprise: An overview of US-UK co-operation on armed drone operations’. Drone Wars UK, 6 June 2020. https://dronewars.net/wp-content/uploads/2020/06/JointEnterprise.pdf
49. ‘RAF F-35A marks a significant step in delivering a more lethal Integrated Force and joining NATO Nuclear Mission’. Royal Air Force, ibid.
50. ‘Oral evidence: Strategic Defence Review’. House of Commons Defence Committee. HC 973, ibid. Q35-37.
51. Lee Pilgrim: ‘The UK’s F-35 Procurement Strategy: A Balancing Act’. The Wavell Room, 4 July 2025. https://wavellroom.com/2025/07/04/the-uks-f-35-procurement-strategy-a-balancing-act/
52. Nick Ritchie and John Walker: ‘Irreversibility and Nuclear Disarmament: The Case of Denuclearising the Royal Air Force’. York IND Research Report No.3, April 2024. P39. https://www.york.ac.uk/media/politics/documents/yorkindproject/2024%20Report3%20Ritchie%20&%20Walker%20Denuclearising%20the%20RAF.pdf
53. ‘NATO’s nuclear deterrence policy and forces’. NATO, 24 June 2025. https://www.nato.int/cps/en/natohq/topics_50068.htm
54. Bernard Gray: ‘Pleasing President Trump is poor value for Britain’s £2bn’. Observer, ibid.
55. According to the US government, “Specific language within the Nassau Agreement [under which the US undertook to provide the UK with a nuclear armed submarine capability] highlighted the NATO purpose, stating ‘…except where Her Majesty’s Government may decide that supreme national interests are at stake,’ submarines of the United Kingdom equipped with the Polaris missile would ‘… be used for the purposes of international defense of the Western Alliance in all circumstances.’”. ‘Polaris Sales Agreement’. US Navy Strategic Systems Programs. https://www.ssp.navy.mil/About-Us/SSP-Mission/Safeguard/Polaris-Sales-Agreement/
56. ‘NATO’s nuclear deterrence policy and forces’. NATO, 24 June 2025, ibid.
57. Oral evidence: Strategic Defence Review’. House of Commons Defence Committee. HC 973, ibid. Q34.

58. Ian J. Stewart: 'UK considers reintroducing air-launched tactical nuclear weapons'. Bulletin of the Atomic Scientists, 16 June 2025. https://thebulletin.org/2025/06/uk-considers-reintroducing-air-launched-tactical-nuclear-weapons/
59. Fabian R. Hoffmann: 'The strategic-level effects of long-range strike weapons: A framework for analysis'. Journal of Strategic studies, Vol 47 (6-7), P964-1000. 28 May 2024. https://www.tandfonline.com/doi/epdf/10.1080/01402390.2024.2351500
60. "New 2,000 km 'deep precision strike' weapon to be developed by UK and Germany as Trinity House Agreement delivers first major milestones". Ministry of Defence, 15 May 2025. https://www.gov.uk/government/news/new-2000-km-deep-precision-strike-weapon-to-be-developed-by-uk-and-germany-as-trinity-house-agreement-delivers-first-major-milestones
61. 'Trident Alternatives Review'. Cabinet Office, 16 July 2013. https://assets.publishing.service.gov.uk/media/5a7c65b1e5274a7ee2567320/20130716_Trident_Alternatives_Study.pdf
62. 'Trident Alternatives Review'. Cabinet Office, ibid. Para 20, p6.
63. Net present value whole life costs. The Trident Alternatives Review gave a total figure of just under £25 bn for the option, but this included the costs of building two SSBNs to provide nuclear cover while the new warhead was being developed. These SSBNs would not be required if the aim of the programme was to develop a theatre nuclear capability to operate alongside Trident. 'Trident Alternatives Review'. Cabinet Office, ibid. Chart A, p7.
64. 'Trident Alternatives Review'. Cabinet Office, ibid. Para 25, p8.
65. Oral evidence: Strategic Defence Review'. House of Commons Defence Committee. HC 973, ibid. Q31.
66. 'What sector should the UK government spend more on?' YouGov. https://yougov.co.uk/topics/society/trackers/what-sector-should-the-uk-government-spend-more-on
'Would you support or oppose tax increases on people like you to pay for an increase in defence spending?' YouGov, 2 June 2025. https://yougov.co.uk/topics/politics/survey-results/daily/2025/06/02/a9b6b/2
Ben Clements: 'Surveying public opinion in Britain towards defence spending'. MASR, 4 August 2025. https://www.amsr.org.uk/surveying-public-opinion-in-britain-towards-defence-spending/
67. 'Oral evidence: Strategic Defence Review'. House of Commons Defence Committee. HC 973 Wednesday 2 July 2025, ibid. Q16, Q30.
68. Jonathan Beale, Imogen James: 'UK to buy nuclear-capable F-35A fighter jets'. BBC News, 24 June 2025. https://www.bbc.co.uk/news/articles/c335406gxdvo
69. 'Royal Navy nuclear deterrent submarines conducting increasingly long patrols'. Navy Lookout, 22 September 2023. https://www.navylookout.com/royal-navy-nuclear-deterrent-submarines-conducting-increasingly-long-patrols/
'Royal Navy Vanguard-class submarine comes home after breaking the record for the longest patrol'. Navy Lookout, 17 March 2025. https://www.navylookout.com/royal-navy-vanguard-class-submarine-come-home-after-breaking-the-record-for-the-longest-patrol/
70. John Paul Rathbone: 'UK faces difficult and expensive choice over 'essential' nuclear deterrent'. Financial Times, 26 March 2024. https://www.ft.com/content/b28ae2f3-9f03-4246-9dd6-fe6ffa011cc3
71. 'Northwood Declaration: 10 July 2025 (UK-France joint nuclear statement)'. Prime Minister's Office, 10 Downing Street, 10 July 2025. https://www.gov.uk/government/news/northwood-declaration-10-july-2025-uk-france-joint-nuclear-statement
72. Paul Ingram: 'Is Trident sunk? Britain's new fighter jets are no backup'. UnHerd, ibid.
73. 'UK to purchase F-35As and join NATO nuclear mission as Government steps up national security and delivers defence dividend', Prime Minister's Office, ibid.
74. Hans M. Kristensen, Matt Korda, Eliana Johns & Mackenzie Knight: 'Nuclear weapons sharing, 2023'. Bulletin of the Atomic Scientists, ibid.
75. '70 years of the Russell-Einstein manifesto'. The Royal Society, 8 July 2025. https://www.youtube.com/watch?v=jhWoTkafcwk at 38 minutes 50 seconds.
76. '70 years of the Russell-Einstein manifesto'. The Royal Society, ibid, at 37 minutes 50 seconds.
77. Hans Kristensen & Matthew McKinzie: 'Video Shows Earth-Penetrating Capability of B61-12 Nuclear Bomb'. Federation of American Scientists, 14 January 2016. https://fas.org/publication/b61-12_earth-penetration/
78. Masao Tomonaga: 'The Atomic Bombings of Hiroshima and Nagasaki: A Summary of the Human Consequences, 1945-2018, and Lessons for Homo sapiens to End the Nuclear Weapon Age'. Journal for Peace and Nuclear Disarmament, Vol 2(2), P491-517. 2 December 2019. https://doi.org/10.1080/25751654.2019.1681226
79. Tim Street, 'Stepping back from the brink: the myths of tactical nuclear weapons and limited nuclear war.' Nuclear Education Trust, to be published November 2025. https://nuclearedutrust.org/

80. ‘Oral evidence: The UK contribution to European security. House of Commons Defence Committee. HC 520, 1 April 2025. Q14. https://committees.parliament.uk/oralevidence/15686/pdf/
81. Fred Kaplan: ‘The Bomb: Presidents, Generals, and the Secret History of Nuclear War’. Simon & Schuster 2020. P254-258.
82. Hans M. Kristensen, Matt Korda, Eliana Johns & Mackenzie Knight-Boyle: ‘French nuclear weapons, 2025’. Bulletin of the Atomic Scientists, Vol 81:4, P313-326. 15 July 2025. https://doi.org/10.1080/00963402.2025.2524251
83. Hamish de Bretton-Gordon: ‘Starmer has gone for the cheapest possible tactical nukes’. Telegraph, 26 June 2025. https://www.telegraph.co.uk/news/2025/06/26/tactical-nuclear-bombers-raf-deterrence-putin-russia-gap/

Every effort has been made to ensure the accuracy of this report but Nukewatch and NIS welcome corrections and feedback. Comments should be sent to office@nuclearinfo.org or by post to the address on the back page.

NIS and Nukewatch UK

Nuclear Information Service
Nuclear Information Service is an independent, not-for-profit research organisation. We investigate the UK nuclear weapons programme and publish accurate and reliable information to stimulate informed debate on disarmament and related issues.

35–39 London Street
Reading, Berkshire RG1 4PS
United Kingdom

+44 (0)118 327 4935
office@nuclearinfo.org
www.nuclearinfo.org

Donate: www.nuclearinfo.org/donate
Facebook: www.facebook.com/Nuclearinfo
Twitter/X: @Nuclearinfo
BlueSky: @nuclearinfoservice.bsky.social
YouTube: www.youtube.com/nuclearinfo

Nukewatch UK
Nukewatch UK monitors and tracks the movement of the British weapons of mass destruction. We believe that communities potentially affected by nuclear movements should be aware of their existence and the risks they pose.

+44 (0)7796 226488
spotters@nukewatch.org.uk
www.nukewatch.org.uk

Facebook: www.facebook.com/NukewatchUK
Twitter/X: @Nukewatchuk
BlueSky: @nukewatchuk.bsky.social
Youtube: www.youtube.com/channel/UC2e0_9pSKk4S4XQmne4yDNw

ISBN 978-1-9993413-7-4

Design by Advocate design agency

Nuclear Information Service
+44 (0)118 327 4935
office@nuclearinfo.org
www.nuclearinfo.org

Nukewatch UK
+44 (0)7796 226488
spotters@nukewatch.org.uk
www.nukewatch.org.uk