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B61-12
nuclear bombs:
more risk than
security?

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B61-12 nuclear bombs: more risk than security?

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Executive summary

Documents and open-source reporting have evidenced the return of the US-owned and manufactured B61 nuclear bomb to the UK for the first time since 2008. The upgraded 'B61-12' thermonuclear gravity bomb is useable with the F35A fighter jet, which the UK is in the process of procuring from the US in hopes that the UK may participate (the UK already makes a nuclear contribution to NATO', since its nuclear weapons are assigned to the Alliance's defence) in NATO's nuclear mission, whereby NATO allies contribute aircraft, personnel, and infrastructure for the deployment of these US nuclear weapons as part of NATO's collective nuclear defence of Europe. The US retains sole authority over the bombs, although their use in the context of NATO's nuclear mission requires approval from NATO's Nuclear Planning Group and the UK Prime Minister and US President. Nuclear weapons deployed under nuclear sharing arrangements are often referred to as 'tactical nuclear weapons,' reflecting their primary intent for 'battlefield use'; in contrast to the far more powerful 'strategic nuclear weapons', such as the UK's Trident, though this distinction is often challenged and dismissed, and the B61-12 further dissolves the distinction as its characteristics make it capable of being a 'tactical/strategic' weapon.

Counter intuitively, the B61-12 has been advocated as contributing to arms control and non-proliferation, first, by advancing American arms control agreements with Russia, secondly, by consolidating multiple legacy variants of the B61 into a smaller overall nuclear stockpile, and finally, by the larger practice of nuclear sharing dissuading host-countries from acquiring their own nuclear weapons. These measures delivered meaningful benefits, such as greater transparency, even if they did not address all nuclear weapons and conventional imbalances that incentivise proliferation (gaps that renewed diplomacy could address). However, the B61-12 remained wedded to the risky and nebulous strategy of nuclear deterrence. Furthermore, the B61-12 introduces new weaknesses to this logic, including elevated risks of nuclear escalation and distinctive credibility issues. Also, the purportedly

improved accuracy of the B61-12 may make nuclear use more thinkable in a conventional conflict, which defies the logic that they are primarily intended for deterrence. On the other hand, the use of the bomb in such 'first-use' circumstances could not only be constrained by low public opinion, which also lowers its credibility in these scenarios, but is also unlikely to yield battlefield gains while incurring devastating humanitarian impacts. Given these weaknesses, the utility of the bombs and broader nuclear sharing structure they are hoped to serve are mostly symbolic and political.

Due to this, the UK and other nuclear-armed and hosting states should reduce their reliance on nuclear weapons for defence in favour of stronger conventional capabilities, while also initiating diplomatic exchanges to address shared threat perceptions and lower the risk of conflict, which can contribute to a foundation for future talks on conventional arms control as well as more comprehensive nuclear arms control. Given the possibility that the B61-12 may lower the nuclear threshold, risk-reduction measures should also be pursued. The end of New START risks triggering an unchecked escalation in the nuclear arms race, which makes it essential for US and Russia, with European encouragement, to resume arms control talks especially due to historically high nuclear risks. The crisis raised by the expiration of New START hence presents an opportunity to renew and consider more comprehensive approaches to arms control.

Acronyms

CAC – Conventional Arms Control

HASC – House Armed Services Committee

DCA – Dual Capable Aircraft

LEP – Life Extension Program

NFU – No First Use

NPG – Nuclear Planning Group

NPR – Nuclear Posture Review

NWSs – Nuclear Weapons States

NNWSs – Non-nuclear Weapons States

RAF – Royal Air Force

TNW – Tactical Nuclear Weapons

SALT – Strategic Arms Limitation Treaty

SNW – Strategic Nuclear Weapons

START – Strategic Arms Reduction Treaty

Introduction



CREDIT: US AIR FORCE

Two B61-12 development shapes (Joint Test Assembly) under F-15E during test flight in 2015.

Nine countries currently possess nuclear weapons, and five of these countries are formally recognised as nuclear weapons states (NWSs) by the Non-Proliferation Treaty (NPT), the foremost international-level treaty to advance non-proliferation or prevent the spread of nuclear weapons, which entered into force in 1970. Yet an additional group of states participates in ‘nuclear sharing’. Nuclear sharing is an arrangement that allows certain states to operate delivery platforms licensed and capable of deploying nuclear weapons owned by the US, specifically B61 bombs. All of the European states under this arrangement are non-nuclear weapons states (NNWSs), though the UK, a NWS, is planning to participate. The ‘sharing’ qualifier reflects the fact that the weapons are US-owned and controlled and hence usable with US permission – and in the case of NATO’s nuclear mission, agreement among NATO’s Nuclear Planning Group and the UK Prime Minister’s authorisation – and host states provide and maintain the fighter aircraft, crews, and certain supportive infrastructure for the weapons. As communicated in a NATO fact sheet, this arrangement ensures that the Alliance ‘shares’ in the nuclear defence of Europe¹.

These weapons are stationed in the European bases of the participating states, and in US controlled facilities within those bases. The UK along with NATO maintain a longstanding policy to neither confirm nor deny the presence of nuclear weapons at a given location², but six NATO countries, including the UK, are currently believed to host bases that store US nuclear bombs: Belgium, Germany, The Netherlands, Italy, and Turkey³. The UK’s participation dates to the Cold War, and the UK was also the first country on the continent, in 1954, to receive US nuclear weapons,⁴ although this arrangement is believed to have ended in 2008. The bombs operable under nuclear sharing arrangements are also often referred to as ‘tactical’ nuclear weapons (TNWs).

The storage of these weapons on the territory of European allies of the US, also called the forward deployment of nuclear bombs, have long been controversial, especially since the NPT obliges NWSs to negotiate the elimination or disarmament of nuclear weapons in good faith in exchange for NNWSs forgoing the acquisition of nuclear weapons for themselves. The five NWSs have collectively made statements reaffirming their commitment to their nuclear disarmament obligation⁵ but the participating states under nuclear sharing continue to justify

the deployment of these bombs on the grounds of nuclear deterrence i.e. dissuading adversaries from undertaking hostile actions against the state or their interests by threat of nuclear retaliation. The factor of US ownership means that the practice of nuclear sharing can also be seen as 'extended deterrence', through which NWSs such as the US aim to prevent attacks on non-nuclear armed allies by threat of an American nuclear response. But in the case of US-owned and forward-deployed nuclear weapons in Europe, should the threats be realised and nuclear weapons used, the bombs can be delivered by the US allies who host these weapons on their territory.

It is thus difficult for NWSs to claim to be upholding the spirit of the NPT's disarmament commitment while those same states continue to legitimise nuclear deterrence, the central defence doctrine that underpins nuclear weapons, which in turn incentivises NNWSs to develop them, which may lower the appeal of non-proliferation. Moreover, the ongoing deployment of these weapons not only marginalises nuclear disarmament but also sidelines more advantageous and stable security postures rooted in conventional defence capabilities.

In 2025, the UK government under Prime Minister Keir Starmer announced the acquisition of F-35A Lightning II Joint Strike Fighter jets, and unearthed evidence prior to and during that year pointed to the deployment of B61 nuclear bombs, particularly the upgraded B61-12, to the UK and other European countries. While these fighter jets are mainly intended for training purposes, their procurement has also been presented as supporting the potential entry of the UK into NATO's nuclear mission, although the UK would need to overcome considerable obstacles to be able to participate in the future. These developments significantly renew the urgency of addressing these concerns, particularly in the UK but also the international context.

This report proceeds in six parts. First, it briefly defines TNWs and examines how their supposed distinction from 'strategic nuclear weapons'

(SNW) has been understood and criticised, before outlining the UK's evolving relationship with these weapons. Second, it summarises the B61 family of nuclear gravity bombs, the tactical variants of which have been historically deployed in the UK and Europe, and describes the design, capabilities, and storage and security features of the B61-12, the B61 that was upgraded and modernised under the B61-12 Life Extension Programme and is currently forward deployed in the UK and Europe. Third, the consequences of the B61-12 modernisation programme for arms control, non-proliferation, and disarmament are assessed, showing how the bomb was predicated on arms control agreements, namely New START, while the B61-12 modernisation program and nuclear sharing were rationalised as advancing arms control and non-proliferation. Yet, the bomb is intended to reinforce nuclear deterrence, despite the substantial weaknesses and dangers of this posture.

Fourth, it shows how the B61-12 could also weaken the practical foundations of nuclear deterrence even further by introducing new risks and ambiguities due to its technical and political limitations. Fifth, it demonstrates how, should the fragile logic of nuclear deterrence crumble and the bombs be used, that even supposedly 'limited' nuclear use, which is constrained by low public support, can still generate catastrophic consequences for civilians and the environment. Finally, it advances alternative strategies, including a focus on conventional military capabilities and conventional arms control, as more credible and durable pathways for reducing nuclear dangers and increasing security. This is also supplemented by appeals for the US, Russia, and Europe to initiate diplomatic talks for arms control and explore opportunities to address mutual threat perceptions and reduce the risks of violent conflict. This is then followed by how these alternatives may be more viable to domestic policy and political audiences, and how New START, whose implementation shaped the development of the B61-12, may also politically undermine the forward deployment of B61 gravity bombs upon its expiration. Concluding remarks and policy recommendations are then provided.

Tactical nuclear weapons: definitions and the UK experience

While TNWs are often understood as lower-yield ‘battlefield’ nuclear weapons, in contrast to ‘SNWs’, which are higher yield and principally ‘city-destroying’ bombs targeted at key military and strategic targets of the adversary,⁶ this TNW/SNW distinction has been heavily contested, and several government officials have assailed this dichotomy as an artificial and non-existent construct. High-level US government officials who have supported this position include the former US Secretary of Defense James Mattis⁷ and the former Vice Chairman of the Joint Chiefs of Staff, John Hyten.⁸ Notable officials within the UK who have also eschewed this distinction include Des Browne,⁹ former Secretary of State for Defence, and Maria Eagle, the former Minister of State at the Ministry of Defence (MOD).¹⁰ These critics converge on the general point that all nuclear weapons are effectively strategic, in the sense that their use can trigger an unpredictable and uncontrollable cascade of effects while raising nuclear response as a real possibility in warfare. Hence, the term ‘TNW’ will be retained for descriptive purposes while normatively committing to the position expressed above that the TNW/SNW distinction is arbitrary. The following section will provide a brief history of nuclear weapons labelled as ‘TNW’ in the UK before providing details of the return of these weapons and how their upgraded characteristics further affect this distinction.

UK history

One early British nuclear weapon acknowledged as one of the first TNW was designated Red Beard, which had a yield of 15 kilo tons (kt), and was in service from 1960-1973, but was eventually succeeded by the WE177.¹¹ The yield of 15kt is equivalent to the nuclear weapon dropped on Hiroshima in Japan which killed and irradiated hundreds of thousands of civilians and obliterated infrastructure, and the bomb subsequently dropped on Nagasaki had a yield of 21kt¹²

The WE177, like the past Red Beard and future B61, was a gravity bomb, a munition that is dropped by aircraft in ‘unguided’ modes¹³ (in the case of the UK, aircraft

operated by the Royal Air Force (RAF)). The WE177 was manufactured by the UK and entered service in 1966 in three variants: A, B, and C. The WE177A, entering service by 1969, had a yield of 10 kt, which reflected the opinion held by the MOD at the time that TNWs should not exceed this yield.¹⁴ The WE177B, developed as an interim measure, had a considerably higher yield of 450kt, but was intended for strategic roles. The WE177C, entering service by 1972 and at 200 kt, met NATO’s condition for a high-yield TNW capped at 200 kt.¹⁵ These varying yield thresholds, especially when contrasted with the bombs dropped on Japan, further illustrate how vague and misleading it is to describe TNWs as ‘lower-yield’ or ‘small’ nuclear weapons.

In addition to maintaining its own TNW arsenal, the UK, like several other NATO members, participated in nuclear-sharing arrangements. US bombs shared with the UK that first arrived in 1954 were stored at RAF Lakenheath, in Suffolk. Though, the UK also shared US nuclear weapons under Project E.¹⁶ At this time, the UK along with other European states invested in nuclear weapons to balance against the Soviet Union’s pre-eminence in conventional weapons and capabilities.¹⁷

Following the end of the Cold War, and the successive US-Russian reductions of their nuclear weapons stockpiles and the START (Strategic Arms Reduction Treaty) agreement, which placed mutual reductions on US and Russia SNWs and delivery systems, the UK retired its WE177 by 1998 and has not maintained an air-delivered tactical nuclear capability ever since. Though the US significantly reduced its forward deployed nuclear weapons in Europe, an estimated 100 bombs remained, and those assigned to the UK continued to be stored at RAF Lakenheath until 2008.

However, documents analysed by the Federation of American Scientists (FAS) in 2022, based on US Department of Defense disclosures, revealed NATO adding RAF Lakenheath to a list of nuclear weapons storage sites to be upgraded¹⁸. Additionally, a now-deleted document cited by the BBC in the UK stated that related work at Lakenheath was underway in



CREDIT: US AIR FORCE

Display of B61-12 at Kirtland Air Force Base.

preparation for its ‘upcoming nuclear mission.’¹⁹ Nukewatch, an organisation that tracks and monitors the movements of the UK’s nuclear weapons system, reported evidence that strongly corroborates this development. Photos of a US Air Force (USAF) C-17 Globemaster at Lakenheath on 17 July 2025 appeared to show nuclear weapons being unloaded, and analysis of flight-tracking data for the C-17 and other activity at the base reinforced this conclusion.²⁰ This closely followed the UK formally announcing its purchase of dual-capable aircraft (DCA), specifically the F-35A, which can carry nuclear and conventional weapons, and which, despite being mainly intended for training, have been described as potentially contributing to NATO’s airborne nuclear mission in the future. These

developments are interlinked because the B61 bombs returning to the UK are certified to be launched from the F-35A platform.

The B61 family and the B61-12

The B61 family

The B61-12 comes from a wider family of B61 gravity bombs, which first entered service in 1968. Information provided by FAS reveals key information about the core features of the B61 family. The B61 has come in several ‘variants’, which can be distinguished according to their yields.²¹ Information about these bombs is provided below in Table 1. As can be seen, the highest yield of all the B61 bombs far surpasses the explosive strength of the two bombs used against Japan in WWII. As also indicated, the B61-12’s variable yield falls within the same range as that of the B614, which is because the B6112 uses a refurbished version of the B614’s warhead. According to remarks in the US from 2013 by a member of the Subcommittee on Strategic Forces during a House Armed Services Committee (HASC) hearing on nuclear modernisation programmes, the Obama administration at the time anticipated that the tactical variants of the B61 would remain forward-deployed in Europe for the next 50 years.²²

The aircraft in the B61 family can be ordered into ‘strategic’ or ‘tactical’ categories, with fighter aircraft such as the F-35A being tactical and heavy ‘bombers’ such as the B2A Spirit bomber being strategic. The tactical/strategic distinction of the B61 family is dictated by the delivery aircraft, and the associated differing mission sets, they are coupled with. The F35A Lightning II stealth fighter comes from the F35 family that includes B and C variants. In 2024, the Netherlands became the first European country to announce that it would acquire F-35As for NATO’s nuclear mission, followed in 2025 by the UK.²³ In the UK, F-35As are already stationed at Lakenheath and will be assigned a US Air Force (USAF) nuclear mission, but the F-35As the UK will purchase will be based at RAF Marham, Norfolk. Assuming the achievement of staggering tasks, such as meeting ambitious availability and delivery targets for the aircraft, and overcoming obstacles linked to operational readiness, these aircraft may be capable of joining NATO’s nuclear mission.²⁴ The B61-3 and B61-4 are the variants that have traditionally been forward deployed in Europe.²⁵

Table 1. B61 variants

B61 Variant	Yield	Classification	Status	Guidance
B61-3	0.3, 1.5, 60, 170	Tactical	Inactive	Unguided
B61-4	0.3, 1.5, 10, 50	Tactical	Inactive	Unguided
B61-7	10-360	Strategic	Inactive	Unguided
B61-10	0.3, 5, 10, 80	Tactical	Inactive	Unguided
B61-11	400	Strategic	Active	Unguided
B61-12	0.3, 1.5, 10, 50	Tactical/Strategic	Active	Guided
B61-13	50, 360	Strategic	Planned	Guided

Source: Federation of American Scientists

Table 2. B61-12

Physical dimensions	Length: 11 feet, 8 inches Diameter: 1 foot, 1 inch Weight: 825 pounds
Delivery	Gravity bomb with glide/standoff Guided tail-kit
Detonation modes	Airburst Ground burst

Source: Air & Space Forces Magazine²⁶

Table 3. Aircraft capable of carrying the B61-12

Aircraft	Classification	Guided Delivery Capability
B-2A	Strategic	Yes
B-21	Strategic	Yes
F-15E	Tactical	No
F-16C/D	Tactical	No
F-16MLU	Tactical	No
F-35A	Tactical	Yes
PA- 200 Tornado	Tactical	No

Source: Federation of American Scientists

Active warheads in the US stockpile are kept in operational status and ready for use on short notice, with their tritium bottles and other limited-life parts installed. In contrast, inactive warheads are stored in depots in non-operational status; with their tritium bottles removed. Warheads are retired when they are taken off their delivery systems and removed from the nuclear stockpile, while dismantled warheads are broken down into their individual component parts²⁷.

The following section provides an overview of the B61-12 variant, its implications for the active and inactive status of other B61 variants, and the significance of its 'guided' capabilities.

The B61-12 and its delivery aircraft

The provision of upgrades to an existing nuclear weapons stockpile is defined as 'nuclear modernisation'. Plans for upgrades to the B61 that eventually manifested as the B61-12 Life Extension Program (LEP) were foreshadowed in 2008, when the USAF was reportedly considering a 'B61-Mod 12' to extend the bomb's service life, enhance safety features to reduce the risk of theft or accidental detonation, and replace all but the most modern B61 variants.²⁸ The Department of Defense's 2010 Nuclear Posture Review officially confirmed that the US would proceed with the B61 LEP to extend its life by 20 years by replacing

its nuclear and non-nuclear components, with production expected to begin in 2017, and for the bomb to be integrated with the F-35.²⁹

The B61-LEP sought to replace and ultimately consolidate three previous B61 tactical and strategic designs, specifically, the B61-3, B61-4, and B61-7.³⁰ Initial plans for the B61-12 were to consolidate these three B61 variants in addition to the B61-10. However, upon the B61-10's retirement in 2016, the consolidation plan was reduced to these three variants³¹. According to the Government Accountability Office, this consolidation would cut the number of nuclear gravity bombs in the US arsenal by half.³² In October 2024, the Biden administration announced the development of the B61-13, a successor to the B61-12. The new variant is intended to replace some of the B61-7s in the stockpile and will feature a comparable yield to that bomb, which will be higher than the yield for the B61-12, while carrying over the B61-12's improved safety, security, and accuracy features. The B61-13 is also described as offering 'additional options against certain harder and large-area military targets.'³³ The first assembly of the B61-13 was completed around mid-2025, five months after completion of the last production unit of the B61-12.³⁴ After the B61-13 enters service, the active US stockpile will hence be comprised of the B61-11, B61-12, and B61-13.

Like the F-35 it is paired with, the B61-12 LEP was struck by delays and cost overruns. In 2010 the National Nuclear Security Administration estimated that the B61-12 LEP would cost \$4 billion.³⁵ But in 2013, it was believed that the B61-12 LEP would end up amounting to \$10-12 billion, then asserted by a Pentagon panel to be the most expensive LEP the US has ever embarked on.³⁶ By its completion, the cost totalled \$9 billion.³⁷

In 2020, the F-15E, which along with the F-35A is stationed at RAF Lakenheath, became the first delivery aircraft to be compatible with the B61-12 following a successful test with a mock version of the weapon.³⁸ The B61-12 became operational in 2023, and first cleared for operational use on B2 strategic bombers.³⁹

The F-35A in turn was officially certified to be compatible with the B61-12 by 2024, which also marked its transition into a DCA and the first time a stealth aircraft was designated as being certified to carry a nuclear weapon.⁴⁰

Key characteristics of the B61-12 and its delivery aircraft are summarised in Tables 1-3. As shown, one of the significant innovations of the B61-12 is its ability to be deployed on both tactical and strategic aircraft. According to additional analysis by FAS, the B61-12 effectively nullifies the distinct categories of 'non-strategic' and 'tactical' warhead categories in the US nuclear arsenal, as the bomb will be capable of executing tactical and strategic missions and be replacing remaining tactical B61 variants,⁴¹ which is why they can be grouped as 'tactical/strategic' as shown in Table 1.

The tail-kit assembly is a hallmark feature of the B61-12. This upgrade converts the B61-4 into a guided standoff nuclear bomb, the first of its kind. Such digitally guided delivery is executed by the tail-kit assembly steering the bomb along a controlled flight path, and this is contrasted with the 'unguided, free-fall delivery' seen in the previous B61 variants, although the B61-12 is also still capable of such unguided delivery.⁴² The guided delivery feature is believed to improve the B61's accuracy, thus making it achieve destructive effects that previously required higher-yield warheads and with less radioactive fallout (higher yields were generated to 'compensate' for the relatively lower accuracy of earlier bombs). These are the features of the bomb that have elicited significant attention and concern. The perception that it is more accurate and produces less radioactive fallout may reduce the perceived 'costs' of nuclear weapons use and consequently make their employment more likely.

The B61-12's upgraded capabilities, particularly the ability of the tail-kit assembly to enable it to penetrate the earth and cause an explosion beneath it, has also earned it a reputation as a potentially formidable 'bunker buster' bomb.⁴³ The '12 Day War' between

Israel and Iran during 2025 provides an illustration of how the B61-12's earth penetrating capabilities might be exploited. During the conflict, the US intervened and launched conventional GBU-57 MOP bunker-buster bombs against Iranian nuclear facilities to counter Iran's nuclear programme, which reportedly set back the programme but failed to eliminate it. The Defense Threat Reduction Agency assessed that only using a TNW dropped from a B-2 Spirit bomber, following the 'softening up' of the site by a conventional attack, could destroy the underground core of the facility at the Fordow Fuel Enrichment Plant, but this option was neither considered by President Trump nor briefed by the Secretary of Defense Pete Hegseth.⁴⁴ The B-2 Spirit in turn is compatible with the B61-12. This means that it is possible that the B61-12 could hold hard and deeply buried targets at risk.

Another signature and novel characteristic provided by the TKA is a modest standoff capability. 'Standoff capability' generally refers to a weapon's ability to hit a target from far enough away that the delivery platform doesn't have to enter within the target's 'defensive area'.⁴⁵ In other words, the lower the standoff capability, the closer the delivery platform must get to the target, and potentially within the range of the target's defences, to release the payload. However, the extent and nature of the bomb's 'modest' standoff capabilities remain unclear. Also, while a hypothetically effective standoff capability would improve the safety and survivability of the bomb's delivery aircraft compared to earlier variants, it also demonstrates the importance of attaching these bombs to platforms like the F-35A, whose stealth features can also augment safe ingress and egress during the delivery of these bombs (assuming they are not highly vulnerable to technology that can detect stealth aircraft).

The F-35A and the B61-12 have other interactive performance characteristics. As shown in Table 3, some older aircraft operated by participants in NATO's nuclear mission cannot fully exploit the B61-12's advanced guided delivery capabilities. This reinforces the impetus

for these states to acquire aircraft the F-35A which, as shown, is the only fighter aircraft with these capabilities. Additionally, the bomb's capacity to reach key strategic targets depends on the integration of certain support systems into the F-35A. US TNWs in Europe can reach targets in Russia when their delivery aircraft are supplemented with in-flight refuelling support. Yet the RAF do not currently possess tanker aircraft to provide such refuelling⁴⁶; though USAF can refuel the F-35As with its own tanker capabilities, thus enabling them to perform missions with extended ranges.⁴⁷

Storage and security of the B61-12

Countries that host US nuclear bombs have bases equipped with aircraft shelters with internal Weapons Storage and Security Systems (WS3), owned by the US, to store the bombs. 33 of these vaults were installed in RAF Lakenheath, while 24 were installed in RAF Marham.⁴⁸ The number of B61s stored by each host-nation base varies, with estimates placing the higher total at 20–30 bombs and lower estimates hovering around 10–15.⁴⁹ However, while RAF Marham is officially confirmed as the base for the F-35A, the basing of the B61-12 has not been publicly confirmed. One possibility is that aircraft based at Marham in Norfolk could fly to RAF Lakenheath to be loaded with the weapons in the event of a crisis. Another is to store the bombs at Marham itself, which also served as the storage site for the WE177 TNW during the Cold War.⁵⁰

One of the earliest-stated objectives of the B61-12 LEP was to reduce the risk of accidental detonation, which has clear public safety implications. Consistent with this objective, the B61-12 has been built to meet high safety standards. In 2016, Sandia National Laboratory simulated a high-speed accident to test this feature. This involved a mock B61-12 sliding down a 10,000-foot rocket sled track into a steel and concrete wall to examine the weapon's features that prevent accidental detonation.⁵¹

The B61-12, arms control, non-proliferation, and disarmament



CREDIT: US AIR FORCE

B61-12 onboard a C-17.

Nuclear modernisation presented as arms control/nonproliferation

Nuclear Information Service (NIS) has previously conducted research showing widespread global criticism towards nuclear modernisation, even from some NWSs, including the US. In 2017, the US warned of countries developing new nuclear capabilities, yet the B61-12 introduces new capabilities to the B61 family. And by 2018, the US even linked the low prospects of disarmament to the modernisation programmes in Russia, China, and North Korea.⁵²

The US government's decision at the time, under the Obama administration, to proceed with the B61-12 LEP initially also garnered domestic controversy, particularly given the previous stimulus for arms

control and political appeals to reduce the role of nuclear weapons shortly before.⁵³ However, some officials in the Obama administration justified assent to these nuclear modernisation plans as a necessary precondition for securing US Senate approval for the eventual ratification of the New START Treaty with Russia in December 2010,⁵⁴ which was an updated agreement between the two states to place additional limits on their strategic nuclear warheads and delivery systems. This logic informing the Obama administration's decision reflects historical instances in the US in which domestic political officials are 'bought off' with nuclear modernisation plans to secure their backing for arms-control agreements. A direct historical parallel to the case of the B61-12 LEP and New START is the Strategic Arms Limitation Treaty (SALT I) of 1972. Like New START, the Secretary

of Defense and the Joint Chiefs conditioned their support for SALT I on the administration committing to nuclear modernisation.⁵⁵

In a hearing in the HASC session on Nuclear Weapons Modernisation Programmes, General Robert Koehler, then US Commander of US Strategic Command, provided commentary that buttresses this position. Koehler argued that:

*“the need for sustained investments increases as we decrease the number of deployed weapons to New START levels. From a military perspective, smaller numbers of weapons means that the quality and reliability of each weapon must be high”*⁵⁶

During the same hearing, other officials also attempted to reconcile this tension between the administration’s support for arms control and the B61-12 LEP by arguing that the LEP itself facilitated arms control and non-proliferation goals primarily by consolidating several legacy variants of the B61. In effect, this means that the B61-12 LEP enabled the US to reduce its nuclear weapons stockpile while upgrading it.

Additionally, the wider nuclear sharing framework has also been promoted as a non-proliferation mechanism. By extending the protection of US nuclear weapons to NNWSs, proponents argue that these countries may be less willing to develop nuclear bombs of their own.⁵⁷

The following sections will examine the advantages and limitations of these measures for arms control, non-proliferation, and disarmament.

Limitations – New START

Conditioning New START on such modernisation programmes as the B61-12 LEP delivered tangible benefits towards arms control. Since the US and Russia account for the largest share of nuclear stockpiles among NWSs, the limits set by this treaty substantially reduce the overall figure of nuclear stockpiles globally, which contributes to more stabilised relations between the two largest nuclear powers and by extension reduces global nuclear risks.

Additionally, the treaty yielded significant concessions for transparency. The on-site inspections established by this treaty enabled each side to verify that the other was complying with its commitments. This was one of several significant achievements of New START since previous nuclear arms control negotiations between the US and the Soviet Union were often stalemated by the latter’s resistance to permit intrusive on-site inspections.⁵⁸ This demonstrates the significance of imploring the US and Russia to resume diplomatic and arms control talks following the treaty’s expiration in February 2026.

Nevertheless, while New START imposed important limits on SNWs, it made limited contributions to comprehensive arms control by failing to incorporate TNWs.⁵⁹ TNWs are broadly excluded from the raft of strategic offensive arms control agreements agreed upon between the US and Russia, which have imposed decreasing limits on SNWs and consist of the Strategic Arms Limitation Talks/Treaties (SALT I and II in the 1970s), the Strategic Arms Reduction Treaty (START accords of the 1990s), the 2002 Moscow Treaty, and, most relevant in this instance, the 2010 New START Treaty. Indeed, given the difficulties of precisely defining these bombs, TNWs are sometimes defined in a ‘negative’ sense as all nuclear weapons excluded from these treaties.⁶⁰ This exclusion however further underlines the urgency of reviving arms control and diplomatic talks following the end of New START, as the successor treaty was anticipated to not only provide additional cuts to SNW in line with the historical progress on arms control, but to also fill this gap by covering TNWs.⁶¹ This is consistent with statements and preferences expressed from the December 2010 US Senate ratification of New START.⁶² Additional information will be provided of the risks and potential new realities introduced by the B61-12 in a post-New START landscape.

On a different note, New START has also been promoted as reconcilable with nuclear deterrence and, as such, is limited in its ability to reduce reliance on nuclear arms. For example, in a 2013 speech in Berlin invoking

the New START agreement, then-President Barack Obama asserted that the US could reduce its deployed strategic nuclear warheads by up to one-third while still maintaining a 'strong and credible strategic deterrent'⁶³.

Limitations – conventional capabilities

While stockpile reductions alone provide security benefits, there are limitations to viewing such reductions in isolation as effective for inducing arms control and non-proliferation responses from other NWSs. On the one hand, the reciprocal stockpile reductions by the US and Russia since the end of the Cold War contributed to shaping a dynamic of trust and mutual reassurance, which encouraged both states to continually lower their SNWs.

On the other hand, and as noted in a *Strategic Studies Quarterly* paper, these considerable nuclear stockpile reductions undertaken by the US did not elicit reciprocal behaviour from other US adversaries, who still invested in nuclear weapons to balance against the American advantage in conventional capabilities, similar to NATO states against the Soviet Union during the Cold War.⁶⁴ This bears relevance to the current balance of forces between Russia and NATO. Unlike the Cold War period, in which NATO states once relied on nuclear weapons to offset Soviet conventional superiority, contemporary Russia relies on its nuclear forces to offset US and NATO conventional advantage. Russia's reliance on its nuclear capability as a compensatory measure is also likely to grow given the relative underperformance of its 'emerging technologies', such as artificial intelligence (AI) in Ukraine.⁶⁵

Yet, as also illustrated by New START in the previous section, such limitations can be addressed through diplomacy and arms control. One significant reason states may invest in nuclear capabilities to offset conventional inferiority is when defence planning is driven by worst-case thinking⁶⁶, with nuclear forces serving as a hedge against the possibility of defeat or coercion. However, a key benefit of arms control agreements like New START is their capacity to

mitigate this tendency toward worst-case planning; through measures such as enhanced transparency and predictability. This hence reinforces the need to resuscitate diplomatic engagement and arms control talks.

Limitations – nuclear deterrence

Despite being presented as advancing arms control and non-proliferation, the B61-12 LEP was undertaken to reinforce US nuclear deterrence and that of its allies. As stated previously, this can inadvertently encourage proliferation by strengthening the perception that nuclear weapons are highly valuable for security. In a separate HASC hearing on the B61-12, in which General Koehler is asked why the US needs the B61, the General is clear and unequivocal in his response: "It is about deterring. It is about assuring our allies of our extended deterrence commitment to them".⁶⁷ So long as the logic of nuclear deterrence endures, then NWSs will continue to rely on nuclear weapons for their defence and security, even with a shrinking stockpile, as Obama observed in his Berlin speech in reference to New START and SNWs.

This logic of shoring up nuclear deterrence in the face of nuclear stockpile reductions can be extended to the wider nuclear sharing framework which the deployment of B61s draws from. This can be seen from how NWSs responded to the diminishing nuclear stockpiles and growing antinuclear ferment towards the end of the Cold War:

"for NATO's nuclear-armed and nuclear-hosting states, the solution remained the same: shifting more of the moral burden of nuclear defence to the alliance as a whole. Stockpile reductions and nuclear burden sharing thus constituted two sides of the same coin: to adapt to the new normative environment, nuclear deterrence had to be reduced in size militarily and shared more widely politically".⁶⁸

Nuclear sharing, including maintaining bases hosting US nuclear bombs, hence distributes 'political' responsibility for nuclear deterrence across multiple NATO allies rather than solely leaving it to the NWSs.

This logic, as previously shown, is articulated in NATO fact sheets, but the quote above uncovers the broader and tacit implications of this thinking. This shared political responsibility can reinforce alliance consensus around nuclear deterrence as a core element of NATO's defence and security posture, which leaves the NWSs less politically isolated. This political reinforcement has been described in an analysis by Linde Desmaele as a key political function of nuclear sharing.⁶⁹ While this logic bears more direct relevance to the NNWSs that participate in nuclear sharing, it alludes to the wider function of nuclear sharing in politically propping up the policy of nuclear deterrence amidst pressures for nuclear disarmament. Taken together, the B61-12 LEP and the wider nuclear sharing framework which it is central to are hence mechanisms for reinforcing nuclear deterrence as a core principle of the defence and security strategy of the NATO alliance. However, this strategy to politically embed deterrence does not appear to be resonating with the public in various European countries, including those in NNWSs. A YouGov poll from 2025 found that most respondents in Britain and France (NWSs), as well as Germany and Italy (NNWSs that share nuclear weapons), Denmark, Sweden, and Spain (NNWSs that don't share nuclear weapons), oppose US nuclear weapons being stationed on their territories.⁷⁰

In addition, delegitimising deterrence requires recognising its deeply ingrained flaws. For example, proponents of nuclear deterrence often attempt to substantiate the theory by pointing to the absence of major war since WWII after the onset of the nuclear age. However, substantiating this claim is fraught with difficulties because this absence may instead be linked to a host of other factors. For instance, confirming the deterrence argument would require evidence that a planned attack against a NWS was abandoned out of fear of that state's nuclear arsenal, but such evidence is lacking. As such, it is difficult to discern whether the absence of major war since WWII reflects successful deterrence or simply the absence of major adversarial intentions to attack to begin with.⁷¹ For instance, as previously stated, NATO states sought to deter a Soviet

invasion and balance the Soviet Union's superior conventional capabilities with nuclear weapons. Yet George Kennan, the late and eminent American statesman who was the architect of the Cold War policy of Soviet 'containment,' and who eventually became an ardent critic of nuclear weapons and called for nuclear disarmament, later argued that the Soviet Union's conventional military strength and intent to attack NATO and the West were exaggerated.⁷² On a similar note, the claim that extended deterrence functions as a non-proliferation mechanism is itself weakened by cases such as the UK, which developed its own nuclear weapons under the extension of presumed US nuclear protection.⁷³

As the following sections demonstrate, the B61-12 and the forward deployment of nuclear weapons in Europe exacerbate rather than resolve the weaknesses inherent in nuclear deterrence and extended deterrence theories. Some of these limitations stem from technological developments and the technical characteristics of the weapon itself, while others arise from the institutional and political frameworks governing their deployment. Together, these obstacles introduce heightened risks of nuclear escalation and unique credibility problems over the bomb's use.

Ambiguities and limitations of the B61-12

Dual capable capabilities and variable yields

A comprehensive analysis by Tim Street, published by the Nuclear Education Trust, titled *Stepping Back from the Brink: The Myths of Tactical Nuclear Weapons and Limited Nuclear War*, illuminates some of the strategic reasoning behind the current interest in TNWs in the UK. One factor is to reinforce the perceived credibility of nuclear deterrence, particularly amid Russia's growing nuclear sabre-rattling following its full-scale invasion of Ukraine. Proponents of TNWs argue that, without a comparable tactical option of their own, the UK may be reluctant or unable to respond proportionately to a Russian tactical nuclear strike, particularly since retaliating with the strategic Trident system would be disproportionate and hence politically and legally contentious. Whilst some maintain that Trident retains a variable yield and, by extension, a sub-strategic role, adversaries may nevertheless interpret a Trident launch as strategic, thus prompting a strategic-level response.⁷⁴

Hence, while some critics contend that TNWs may lower the nuclear threshold, and that the enhanced precision and accuracy of the B61-12 will make nuclear weapons appear more useable, for nuclear weapon advocates using this logic, this is precisely the point. The fact that such weapons are more useable is what strengthens their perceived ability to deter: adversarial states would be less inclined to launch a first strike on the UK with TNWs if they anticipate that the UK will deliver a proportionate tactical response. The ensuing mutual vulnerability is then assumed to be what upholds the non-use of nuclear weapons on each side.

Yet, and even if one were to take the dubious tactical/strategic distinction for granted, should the F-35A and B61-12 assume such 'tactical' responsibilities, it would raise a quandary for this argument. The combined characteristics of the F-35A and the B61-12 entail that the UK and other NATO members would be fielding weapon systems that can carry either conventional or nuclear payloads, and if nuclear, armed with

weapons whose yields span highly variable degrees of strength. Dual-capable platforms alone have long posed escalation risks for this reason but attaching them to a variable-yield nuclear bomb like the B61-12 multiplies these challenges. An adversary would be uncertain as to not only whether an incoming strike is conventional or nuclear, but also what the magnitude of the impending nuclear detonation will be. These ambiguities are magnified when considering that even the low yield options of the B61-12, as described earlier, can result in effects previously requiring higher yields, and that a mid-air refuelling capability can extend the range of the airborne delivery platform. The F-35A and B61-12 can therefore still elicit a 'strategic' response and gravely raise the risks of calamitous miscalculation.

However, hypotheticals such as this rest on the tenuous assumption that the B61-12 would be authorised for use in the first place. The B61-12's enhanced capabilities still do not address institutional and political issues affecting the bomb's usability. As recently confirmed by Defence Minister Lord Coaker, under NATO's nuclear mission, the bombs will be subject to the authorisation of the US and NATO Nuclear Planning Group (NPG), of which the UK is a part.⁷⁵ The following raise the constraints on such collective decision-making to authorise the use of the B61-12.

Emerging technologies and compressed decision-making time

It is not only unlikely that such consultation could be achieved in the event of a fast-moving crisis and looming nuclear emergency, but also improbable due to how emerging technologies, particularly AI, have significantly sped up the pace of warfare on the modern battlefield.⁷⁶ Nuclear deterrence assumes that decision-makers will remain calm and rational in a crisis and will also have adequate time to properly assess the situation, yet the speed at which decisions must be made, which is accelerated by emerging technologies, can easily overwhelm rational judgment and compress decision-making time. Furthermore, the likelihood of highly dangerous misunderstandings and



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

outcomes arising from scenarios like those described in the previous section is increased by the time-compressing effects of emerging technologies.

Credibility-consensus trade-off

Despite use of the bombs being dependent on collective decisionmaking, one caveat is that the US could potentially unilaterally deploy these weapons. Hence, one tension introduced by the consultation mechanism has been described in an analysis by Jacklyn Majnemer in the Texas National Security Review as the 'credibility-consensus' trade-off of US nuclear weapons on European territory. On the one hand, ensuring consensus among the NPG over the use of these weapons lowers the credibility of their use and its capacity to deter, given that such consensus is unlikely to be forthcoming. Following from this, lowering consensus over their use, by the US downplaying the consensus mechanism, can elevate the bomb's credibility and ability to deter, but at the heightened risk of drawing European hosts into nuclear scenarios that they may not want to be involved in.⁷⁷ This trade-off highlights the implicit dangers to European B61-12-hosting allies in *increasing* the bomb's credibility.

This point also shows that the nuclear sharing framework does not only function to politically entrench nuclear deterrence as a core defence principle as previously explained but also distributes responsibility for a nuclear strike. The high reluctance on the part of NATO allies to assume such responsibility, particularly in scenarios they would have otherwise evaded, raises the premium on achieving consensus but at the cost of diminishing the believability that the bomb could be used.

Then again, as Majnemer cautions, the US is better able to deploy these nuclear weapons unilaterally and against European objections, because the US is less constrained by a European veto than Europe is by American decision-makers.⁷⁸ One potential reprieve for European states in these circumstances is that some US officials have indicated the US is unlikely to rely on

DCA and B61 bombs for a nuclear attack due to them being relatively more vulnerable than submarine or land-based missiles.⁷⁹ This is reinforced by statements from several US military officials that cast doubt on the military utility of these weapons. In 2010, James E. Cartwright, then-Vice Chairman of the Joint Chiefs of Staff, said that US forward-deployed TNWs bore no military use or advantage that wasn't better served by strategic and conventional forces.⁸⁰ Additionally, a Washington Post report from 2022 quoted the assistant defense secretary for nuclear, chemical and biological defense programs under President Barack Obama, who said the bombs had no military value and were only in Europe for 'political reasons'.⁸¹ While these views point to the low likelihood of reluctant NATO states being dragged into a US-launched nuclear attack via nuclear sharing, they are built on assumptions that downplay the military value of these weapon systems.

Divergent threat perceptions

On a similar note, the low likelihood of consensus also stems from the divergent threat perceptions that have long plagued NATO since the end of the Cold War. Different NATO members regard different regions and nation states as their primary threats, but the most relevant divergence in this instance is NATO's Eastern states viewing Russia as a graver threat than its Western partners due to those Eastern states' closer proximity to Russia and Russia's revisionist ambitions.⁸² Furthermore, it has been argued that fears of escalation of the war in Ukraine among the more risk-averse states slowed the deployment of weapons to Ukraine.⁸³

These dynamics can be magnified in the event of decisionmaking over deploying nuclear weapons intended for 'battlefield use'. If the US and some of its NATO allies wavered in authorising conventional weapons transfers out of concern for escalation with Russia, it is difficult to see how they would rapidly approve the use or heightened readiness of nuclear weapons. This reluctance is reinforced by

the previously stated and widely held view that all nuclear weapons use is essentially 'strategic' and fundamentally alters the nature of the conflict.

This issue is linked to an endemic problem with extended deterrence, which is whether the state granting such alleged nuclear protection, in this case the US, would be willing to invite nuclear retaliation against itself in response to protecting NNWSs with their nuclear weapons. The likelihood of inviting such risks is significantly lowered when there is a disparity in threat perception between the NWSs and the NNWSs regarding the adversary.

It is also such speculation that raises doubts as to whether nuclear sharing can prevent nuclear proliferation. Considering such scepticisms, some individuals conclude that states can only accrue the alleged deterrent benefits of nuclear weapons by manufacturing and maintaining ones for themselves,⁸⁴ but the previously mentioned YouGov poll also found that majorities in NNWSs oppose developing nuclear weapons of their own.

Impact of a 'limited' nuclear detonation

The combination of variable-yield options and perceived improved accuracy means that the B61-12 may lower the nuclear threshold and make nuclear use appear more feasible in a conventional conflict. This can subsequently encourage decision makers to contemplate nuclear use not only to dissuade aggression but to coerce adversaries into surrendering, or reversing battlefield gains. Hence the bomb may not only be utilised in a retaliatory capacity but even on a first-use basis in a conflict. Such usage is probable due to neither the US nor NATO maintaining a no first-use (NFU) policy i.e. a commitment not to use nuclear weapons first in a crisis. Russia has similarly not held this policy since 1993.⁸⁵

The previously mentioned 12-Day War between Israel and Iran offers a setting in which such nuclear first use could occur. Historical parallels can be instructive, as in the mid-90s when the Clinton administration in the US approved a modification of the B61-11 strategic bomb for use as a bunker-buster bomb to attack and destroy chemical and biological weapons stored underground, which was a posture that was taken up by the succeeding Bush administration, and this strategy presupposed the first use of nuclear weapons.⁸⁶ While there is no evidence that this is currently the operational policy of the US, this potentially situates the B61-12 within a longer line of US strategic thinking that has contemplated first-use nuclear options and, in theory, such strategies can be revisited in the future.

Yet, to consider the use of nuclear weapons in these instances would amount to a departure from the very role often meant to legitimise them, which is deterrence. This would make their legitimacy much more difficult to sustain as it would require decision-makers and the public to directly confront the disastrous and unavoidable humanitarian consequences that would be inflicted on others and themselves. It is the very magnitude of such effects that are often presented as reasons to retain nuclear weapons: no aggressor would be willing to even risk

being met with such a destructive response and would hence restrain themselves from attacking the NWS to begin with. This exposes a contradiction at the heart of nuclear deterrence: such weapons 'fail' when they are used, but to be credible, nuclear deterrence entails a willingness to use them.

One restraint on the first use of nuclear weapons is public opinion. According to a survey experiment of US and UK government employees in an official capacity and UK parliamentarians, the credibility of a nuclear first use attack against NNWSs significantly increases when bolstered by high public support.⁸⁷ This hence revealed that nuclear policy can be significantly responsive to public opinion. However, polling doesn't show strong public support for such nuclear weapons use. A 2023 survey by British Pugwash and polling company Savanta of 2,320 adults in the UK found 48% opposed the first use of nuclear weapons, while 40% supported such use.⁸⁸ A YouGov poll conducted in April 2022 that sampled 2,219 adults found that 81% of respondents did not believe it was acceptable to launch a nuclear first strike while 5% believed it was acceptable.⁸⁹ A YouGov poll of 2,217 adults conducted in the US in March 2024 found that most American respondents, at 69%, believed nuclear weapons should not be used first in a conflict.⁹⁰ Thus, even if there were an allure to employ the B61-12 in a first-use, warfighting role, such an application, like the contrasting practice of deterrence, may lack credibility.

Also, evidence not only shows significant human and ecological devastation following in the wake of the blast, but also non-existent, and even worsening, gains on the battlefield. Data gathered from wargames and simulated exercises conducted in the US showed that supposedly limited strikes not only failed to compel adversaries to stand down but instead emboldened them to respond with nuclear strikes in kind.⁹¹ Additionally, atmospheric model simulations of conflicts involving many 'small' nuclear bombs suggest a potential 'nuclear autumn', in which, beyond the immediate effects of the spread of radioactive

fallout and scores of civilian casualties, global agricultural production would severely reduce due to diminished solar radiation reaching the land and a global decline in rainfall. In addition, the 'nuclear drought' triggered by explosions over developed land could lead to a global famine, killing up to a billion people, with those in the most food-insecure regions being the most vulnerable.⁹²

Beyond first use, a research paper from the NATO Defence College titled 'Challenges to NATO's nuclear strategy' also shows how small nuclear bombs would not only result in widespread fatal and radioactive effects to civilians and the environment but would also falter in retaliatory military objectives. According to this analysis, a hypothetical 'low-yield' tactical retaliatory strike against Russian strategic locations in Kaliningrad would have to confront "prevailing winds when considering the possibility of fallout onto NATO territory and NATO civilians, and military units being affected by radiation and exposure" thus leading the author to conclude that:

"...it would be extremely difficult for any number of low-yield nuclear weapons used on the battlefield to have desirable effects in NATO's interests, without also creating extremely unpleasant side-effects for NATO personnel and civilian populations. There are few, if any, reasonable uses of nuclear weapons on the battlefield in a way that could conceivably halt forward movement from a prepared, armoured adversary".⁹³

The use of nuclear explosives in a bunker busting role, even at a 1kt magnitude, similarly present grave risks of spreading deadly radioactive fallout to friendly troops and urban civilian areas.⁹⁴

Beyond nuclear deterrence: defence and diplomacy

As NIS has previously argued, since the UK's nuclear weapons programme is likely to accumulate rising costs, this places the programme in a 'trilemma' which may be resolvable by: (1) increasing investment in the nuclear weapons programme at the expense of conventional capabilities, (2) increasing the overall defence budget at the expense of other spending areas, or (3) reducing the costs of the nuclear weapons programme itself.⁹⁵ In light of the severe shortcomings of nuclear sharing, another of its symbolic and political functions delineated by Desmaele is to deflect attention from pressures on participating states to increase conventional capabilities and the defence budget.⁹⁶ But for a NWS like the UK, this can be re-interpreted as nuclear sharing diverting attention away from options 1) and 2). However, the UK and NATO are now at a critical juncture where such deflection may no longer be affordable. Per reports, US officials may be seeking a 2027 deadline for Europe to assume primary responsibility for NATO's conventional defence capabilities.⁹⁷ The latest US National Security Strategy, released in late 2025, echoed these sentiments.⁹⁸

Collectively, these issues and American signals not only point to the growing defence fissures between the US and Europe, and by extension the fragility of US security guarantees, but, in combination with the tense and volatile security environment, also to the urgency for the UK and its European and NATO allies to redirect resources toward capabilities that deliver tangible security benefits, rather than merely symbolic or political ones with potentially grave costs for humanity and the environment.

Conventional defence

Evidence of US approval of the UK redirecting resources towards conventional defence can be found during earlier debates over Trident renewal, when a report on the UK's nuclear weapons and NATO argued that reallocating resources away from nuclear weapons and towards conventional forces could have

mitigated the political fallout of nuclear disarmament in the UK and been endorsed by the US administration at the time.⁹⁹ The reported 2027 deadline set by current US officials suggests that such a redirection of resources may also find favour with the present administration. Additionally, earlier debates also raised objections from Eastern Europe to nuclear disarmament, but Eastern Europe may be similarly placated by redirecting resources to conventional capabilities since NATO's conventional limitations are particularly acute along its eastern borders. So, while NATO outspends Russia on military spending and Russia relies on nuclear weapons as a balancing factor in the event of a major war, it may have stronger prospects of fighting and winning a comparable conventional conflict confined to the Eastern region.¹⁰⁰

Following from this, Poland, an Central European state and NATO member, has expressed a desire to increase its contribution to NATO's nuclear sharing arrangements.¹⁰¹ However contrary to heeding such calls, given the attendant flaws of the nuclear sharing, the UK and NATO can better respond to the immediate threat emanating from Russia by contributing to filling in conventional shortcomings along the Eastern flank of NATO.

Conventional arms control and risk reduction

Contrary to the above, according to an essay from the Stockholm International Peace Research Institute, NATO assessments of the likelihood of a Russian attack, particularly in the Baltic region, may be inflated and not account for the considerable costs that Russia would incur from such an action. These arguments closely echo the views, as previously shown, that were expressed by George Kennan during the Cold War of fears of a Soviet attack on the West being exaggerated. Building on this, the authors call for dialogue between European and Russian experts to gain a clearer understanding of these mutual threat perceptions and to identify opportunities for risk reduction. These discussions are even suggested as possible precursors to conventional arms control (CAC)¹⁰². An argument

has even been made that the breakdown of CAC talks was a significant, if not central, causal factor of Russia's war on Ukraine in 2022.¹⁰³ As Elbridge Colby, the current Under Secretary of Defense for Policy under the Trump administration, argues, a CAC regime would restrict the number of Russian forces near the Baltic states, while NATO countries would agree to comparable limits in their own areas¹⁰⁴. Taken together, European states can invest in conventional defense capabilities while also holding discussions to address mutual threat perceptions and risk reduction, before engaging in CAC.

Domestic political viability

Some European officials believe that investing in conventional defence would be more costly and burdensome than participating in nuclear sharing, and thus such a shift would be difficult to legitimise before the public.¹⁰⁵ However, these concerns may rely on unclear or distorted estimates of the relative costs of nuclear weapons programmes in general and nuclear sharing specifically. The International Campaign to Abolish Nuclear Weapons (ICAN) published a report outlining the various costs and expenses of NWSs' nuclear weapons programmes, but the authors cautioned that estimating the costs of nuclear sharing is complicated by the secretive and opaque nature of nuclear-sharing arrangements.¹⁰⁶ As argued in another ICAN publication, based on publicly available evidence, it's unlikely that the mammoth costs of nuclear weapons programmes would be overshadowed by investments in conventional capabilities,¹⁰⁷ but it is difficult to demonstrate this without full transparency of these programmes and nuclear sharing. Moreover, as shown previously, the public in the UK and other nuclear-sharing states have long been largely opposed to nuclear sharing, meaning that low transparency may erode public support and increase suspicion even more.

Additional challenges to domestically justifying the nuclear mission can be gleaned from a dissertation presented in 2021 about nuclear sharing by Robert G. Bell, former NATO Assistant Secretary General for

Defence Investment. Bell interviewed multiple Obama and Trump officials, as well as NATO political and military leadership, and found that around 90% stated that continuing to participate in nuclear sharing would be profoundly harder to justify, to domestic audiences, without being supplemented with a strong arms control agenda and the extension of New START in February 2021.¹⁰⁸ The need for such an accompanying arms control agenda is based on the 'twin pillars' approach in NATO in which a firm military defence is paired with diplomatic engagement,¹⁰⁹ so the end of New START, which is the last remaining arms control agreement with Russia, would result in the termination of any such engagement and the loss of the diplomatic pillar. While an extension was eventually agreed on by the US and Russia in 2021, New START has now expired by February 2026, thus bringing these legitimisation challenges to nuclear sharing. Accordingly, whereas the US modernisation efforts that birthed the B61-12 were justified as conditions for securing New START, domestic political legitimacy for the continued forward deployment of these weapons may hinge on the treaty's continuation. Following from this, the expiration of New START could threaten the political sustainability of these deployments.

Furthermore, the breakdown of New START is the culmination of the gradual fraying of diplomatic arms control processes preceded by notable collapses such as the end of the Anti-Ballistic Missile Treaty and Intermediate Range Nuclear Forces Treaty, so the diplomatic pillar has long been under considerable stress and needs to be strengthened and revived with European countries and NWSs such as the UK taking the lead.

Conclusion

This analysis examined the return of upgraded US-owned and manufactured B61-12 nuclear gravity bombs to the UK. The assumptions behind the bomb's modernisation and deployment were also interrogated. This investigation showed how the B61-12's enhanced accuracy and variable yield are ostensibly intended to strengthen the credibility of the flawed and dangerous strategy of nuclear deterrence, with a reduced US nuclear stockpile. Also, the employment of these weapons encounters significant political and institutional obstacles, some of which could weaken NATO's unity and cohesion at a moment when such solidarity is essential. However, the bomb's characteristics may also lower the threshold for nuclear use, which is a risk compounded by the absence of policy constraints on the US and NATO on such use, though using the bomb in these circumstances is not only a calamity but also constrained by low public support, which in turn can also greatly limit the credibility of its use in these circumstances.

However, building on this, European nuclear hosts' next security objective should not be singularly focused on attaining a 'proper deterrent'. While the paper presented a case for strengthening conventional defence, it also emphasized the importance of pairing such measures with renewed diplomatic engagement, as is also consistent with NATO practice. European states and the UK must therefore be relatively less mindful of a potential deterrence gap, but more so with the widening diplomacy gap due to the expiration of New START. An exclusive focus on whether defensive capabilities are sufficient to defend against Russia and other adversaries assumes that defence requirements are fixed and objectively determined. But this overlooks the capacity, of diplomacy to reshape these requirements, and facilitate reciprocal arms reductions and long-term security.

The government's decision to join NATO's nuclear mission appeared to have been made hastily, which poorly comports with the Strategic Defence Review authors' recommendation to studiously explore the benefits and feasibility of expanding the UK's

contributions to NATO's nuclear role. Previous analyses, including the F-35A report co-published by NIS and Nukewatch, as well as Tim Street and the Nuclear Education Trust's study on the dangers of limited nuclear war, make a meticulous and thorough case that such participation is highly infeasible and likely to invite more costs and dangers than benefits. With the currently high levels of domestic and international stakes, the government and society cannot afford costly theatrical politics disguised as security policy.

Recommendations

At the national level

- The UK government should pause plans to enter into NATO's nuclear sharing arrangements via the acquisition of the F-35A, pending a thorough and inclusive strategic review of the military utility, political and economic implications, alliance dynamics, and escalation risks associated with such participation.
- The government should be more transparent about its nuclear sharing and weapons stockpile to strengthen public accountability and to enable a more comprehensive cost analysis of the nuclear weapons programme.

At the international level

- The UK along with NATO allies should reignite diplomatic and arms control talks for a successor to the New START Treaty ensuring that any future agreement also covers TNWs.
- The UK and NATO allies should explore ways to strengthen conventional defensive capabilities in Europe, while also opening channels to address mutual threat perceptions and risk reduction. This can be followed by CAC talks with Russia to negotiate mutual reductions in conventional military forces.

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