NATO as a nuclear alliance

NATO's nuclear capability and its evolution in the international nuclear order

Tapio Juntunen, Jyri Lavikainen, Matti Pesu, Iro Särkkä

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Foundations of NATO's nuclear capability and its evolution in the international nuclear order

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Abstract

The aim of this report is to provide an overview of the structure and trends of the international nuclear order, the basics of NATO's nuclear deterrence and its implementation, and decision-making related to the alliance's nuclear weapons policy. The study will also assess how Finland can participate in NATO's nuclear deterrence policy if it so wishes and what effects NATO membership will have on Finland's arms control policy.

Nuclear deterrence constitutes one part of NATO's deterrence mix, and the Alliance views nuclear weapons as the supreme guarantee of its security. U.S. nuclear weapons form the backbone of NATO's nuclear deterrence, and a small proportion of its nuclear weapons are stationed in allied countries. According to NATO's statements, the purpose of its nuclear deterrence is to preserve peace, prevent coercion and deter military aggression. NATO's focus in recent years has been on developing conventional deterrence, but it is also making moderate changes to its nuclear weapons policy.

NATO's nuclear deterrence policy has various participatory elements. The Alliance has its own senior body for discussion on nuclear weapons: the Nuclear Planning Group. Non-nuclear allies such as Finland have several opportunities to influence and participate in the alliance's nuclear weapons policy. Importantly, as a member of NATO, Finland can continue its active arms control efforts.

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Keywords research, research activities, NATO, deterrence, nuclear weapons, national security, arms control

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Nato ydinaseliittoumana
Naton ydinasepelotteen perusteet ja kehittyminen osana kansainvälistä ydinasejärjestystä

Valtioneuvoston selvitys- ja tutkimustoiminnan julkaisusarja 2024:25

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Tekijä/t	Tapio Juntunen, Jyri Lavikainen, Matti Pesu, Iro Särkkä		
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Tiivistelmä

Tämän tutkimusraportin tavoitteena on tarjota yleiskatsaus kansainvälisen ydinasejärjestyksen rakenteeseen ja trendeihin, Naton ydinasepelotteen perusteisiin ja sen toimeenpanoon sekä puolustusliiton ydinasepolitiikkaan liittyvään päätöksentekoon. Tutkimuksessa arvioidaan myös, millä tavalla Suomi voi halutessaan osallistua Naton ydinpelotepolitiikkaan ja mitä vaikutuksia Nato-jäsenyydellä on Suomen asevalvontapolitiikalle.

Ydinasepelote muodostaa yhden osan Naton pelotekokonaisuudesta, ja liittouma näkee ydinaseet sen turvallisuuden äärimmäisenä takeena. Yhdysvaltain ydinaseet muodostavat Naton ydinasepelotteen selkärangan, ja pieni osa sen ydinaseista on sijoitettu liittolaismaihin. Naton linjausten mukaan sen ydinasesuorituskykyjen tarkoituksena on rauhan säilyttäminen, sen painostamisen ehkäiseminen ja sotilaallisen aggression estäminen. Naton viime vuosien painopiste on ollut konventionaalisen pelotteen kehittämisessä, mutta se on myös tekemässä maltillisia muutoksia ydinasepolitiikkaansa.

Naton ydinasepolitiikassa on useita osallistavia elementtejä. Puolustusliitossa on ydinaseisiin liittyvää keskustelua varten oma korkean tason elin: ydinasepolitiikan suunnitteluryhmä. Suomen kaltaisilla ydinaseettomilla jäsenillä on useita mahdollisuuksia vaikuttaa ja osallistua liittokunnan ydinasepolitiikkaan. Suomi voi Naton jäsenenäkin jatkaa aktiivista asevalvontapolitiikkaa.

Klausuuli	Tämä julkaisu on toteutettu osana valtioneuvoston selvitys- ja tutkimussuunnitelman toimeenpanoa. (tietokayttoon.fi) Julkaisun sisällöstä vastaavat tiedon tuottajat, eikä tekstisisältö välttämättä edusta valtioneuvoston näkemystä.
Asiasanat	tutkimus, tutkimustoiminta, NATO, pelote, ydinaseet, turvallisuuspolitiikka, asevalvonta

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NATO som en kärnvapenallians
Grunderna för NATO kärnvapenkapacitet och dess utveckling i den internationella kärnvapenordningen

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Referat

Syftet med denna rapport är att ge en översikt över den internationella kärnvapenordningens struktur och trender, grunderna för Natos kärnvapenavskräckning och dess genomförande samt beslutsfattandet gällande alliansens kärnvapenpolitik. I utredningen bedöms också hur Finland kan delta i Natos kärnvapenavskräckningspolitik, om landet så önskar, och hur Natomedlemskapet påverkar Finlands vapenkontrollpolitik.

Kärnvapenavskräckning utgör en del av Natos avskräckningsmix, och alliansen ser kärnvapen som den högsta garantin för sin säkerhet. USA:s kärnvapen utgör ryggraden i Natos kärnvapenavskräckning, och en liten del av dess kärnvapen är stationerade i allierade länder. Enligt Natos uttalanden är syftet med dess kärnvapenavskräckning att bevara freden, förhindra tvång och avskräcka från militär aggression. Natos fokus under de senaste åren har varit på att utveckla konventionell avskräckning, men man gör också måttliga förändringar i sin kärnvapenpolitik.

Natos kärnvapenavskräckningspolitik har olika inslag av deltagande Alliansen har ett eget ledande organ för diskussion om kärnvapen: planeringsgruppen för kärnvapenfrågor. Icke-kärnvapenallierade, såsom Finland, har flera möjligheter att påverka och delta i alliansens kärnvapenpolitik. Finland som medlem i Nato kan fortsätta sitt aktiva vapenkontrollarbete.

Nyckelord forskning, forkningsverksamhet, Nato, avskräckning, kärnvapen, säkerhetspolitik, vapenkontroll

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Contents

1 Introduction

The international system is currently undergoing significant change, with international politics increasingly characterized by rivalry and confrontation, particularly among the great powers. With the world order being reshaped, nuclear weapons have reappeared on the agenda of international security. Great-power politics, regional security dynamics in Europe, the Middle East and East Asia and technological developments alike have highlighted the significance of nuclear weapons in international affairs.[1] The centre of gravity of the international nuclear order has shifted from measures reducing the role of nuclear weapons towards a re-emphasis on maintaining and implementing nuclear deterrence. At the same time, the arms control arrangements developed over the decades are creaking at the seams.

It was not until Russia's invasion of Ukraine in February 2022, however, that nuclear deterrence and the potential use of nuclear weapons emerged at the core of international security and public debate. Russia's readiness to use tactical nuclear weapons as a show of force or on the battlefield has been analysed broadly, although the most acute concerns regarding the potential use of nuclear weapons has receded.[2] Russia's invasion of Ukraine has also shown how nuclear deterrence can, on the one hand, encourage a state's aggression and, on the other hand, restrict the actions of parties to a war or broader conflict.[3]

Jeffrey Lewis and Aaron Stein have aptly pointed out how – in relation to Russia's invasion of Ukraine – nuclear deterrence has been both a frustrating and terrifying reality. On the one hand, it has limited the freedom of action of both the West and Russia in the broader conflict. On the other hand, nuclear weapons involve the risk of catastrophic harm that policymakers must consider in their decisions concerning war. According to Lewis and Stein, it is no accident that these elements exist, as nuclear deterrence

1 See e.g. Michel and Pesu, 2019.

2 Alberque, 2022a. Some experts still regard the use of nuclear weapons in the context of the war in Ukraine as possible.
See e.g. Schroeder, 2023.

3 See e.g. Ven Bruusgaard, 2022; Sinovets and Vicente, 2022; Freedman, 2022; Juntunen, 2022.

> *"is a mechanism by which the balance of terror functions and this basic reality cannot be wished away, or simply dismissed to support policies that intentionally dismiss what are very real threats to using nuclear weapons".*[4]

As a nuclear alliance, NATO is fundamentally influenced by nuclear deterrence – one of the three elements of its deterrence mix – and the increasing prominence of nuclear weapons in international politics. Three of its 32 allies are nuclear-armed powers, and non-nuclear allies can participate in its nuclear policies through participatory platforms and by providing operational support for its nuclear missions. NATO's nuclear deterrence policy is outlined between the Allies. Its most important body responsible for nuclear deterrence policy is the Nuclear Planning Group (NPG), which consists of all NATO members with the exception of France. Some Allies also take part in NATO's nuclear sharing arrangement. In addition, a number of Allies also take part in its nuclear mission through the Conventional Support for Nuclear Operations (CSNO) mechanism. Since 2014, NATO has been reinforcing its deterrence and defence. Although the main focus in the extensive reforms has been on conventional deterrence[5], the role of nuclear deterrence is also being increasingly discussed and developed.[6]

During 2022, nuclear weapons issues have also made a strong appearance on the agenda of Finland's foreign and security policy. In reaction to Russia's military action in Ukraine, Finland decided in May 2022 to apply for NATO membership. Finland's decision was in part influenced by nuclear threats made by Russia against a non-nuclear-armed neighbouring state and, on the other hand, by NATO's nuclear deterrence. Russia's aggression showed how a nuclear-weapon state can acquire freedom of action for itself against a country that is not protected by a nuclear umbrella. It is this deficit, among other things, that Finland sought to fill by joining NATO in April 2023.[7]

To date, Finland's foreign policy has emphasised, above all, nuclear disarmament, nuclear arms control and non-proliferation. NATO membership makes nuclear deterrence an everyday part of Finland's foreign and security policy. As said earlier, NATO refers to itself as a nuclear alliance and, along with conventional weapons systems and missile defence, nuclear weapons form one part of NATO's deterrence mix, with NATO's Strategic Concept defining nuclear forces as the supreme guarantee for the security of the Alliance.[8]

4 Lewis and Stein, 2022.

5 Covington, 2023.

6 Weaver, 2023.

7 Pesu and Iso-Markku, 2022; Pesu and Iso-Markku, 2024.

8 NATO, 2022a.

This research report produced by the Finnish Institute of International Affairs (FIIA) and Tampere University aims to provide an overview of the structure and trends of the international nuclear order, the rationale behind NATO's nuclear deterrence and its implementation, and decision-making relating to the nuclear weapons policy of the Alliance. The study also examines how Finland may, if it so wishes, participate in NATO's nuclear deterrence policy and how NATO membership affects Finland's arms control policy. As a member of NATO, Finland must decide on its own contribution to NATO's nuclear policy, including the arms control policy of the military alliance, which opens up a new field for Finnish decision-making, policymaking and public debate.

The key research questions of this study are:

- What are the current trends in the international nuclear order and arms control architecture and how do they affect NATO's nuclear deterrence policy?
- What are the principles and elements of NATO's nuclear deterrence?
- How are decisions relating to nuclear weapons made and implemented in NATO and in which ways can Allies participate in the nuclear deterrence policy of the Alliance?
- How can Finland participate in NATO's nuclear deterrence policy and how might NATO membership potentially affect Finland's arms control policy?

Chapter 2 of the report delves into the international nuclear order, its history and ongoing trends. Chapter 3 examines the rationale behind NATO's nuclear deterrence and nuclear deterrence policy: NATO's nuclear doctrine and its development, the nuclear doctrines and arsenals of the Alliance's nuclear-weapon states, and NATO's nuclear sharing arrangements. Chapter 4 discusses the formulation of NATO's nuclear policy and the diversity of stances among Allies on nuclear deterrence and NATO's nuclear deterrence policy. Chapter 5 of the report focuses on assessing Finland's options and the effects of NATO membership on Finland's arms control policy. The concluding chapter summarises the most important conclusions of the study.

The report builds on existing academic and policy-relevant scholarship. The work has taken account of both established as well as more recent research into themes such as deterrence theory, NATO's nuclear policy and its history, and nuclear policy choices of individual Allies. The report also covers ongoing debate taking place within both academic and policy-oriented realms. In addition to secondary sources,

primary material has been collected for the study, consisting of material including official documents and statements of NATO and its allies, such as strategic concepts and summit communiqués. The material analysed also includes comments provided by policymakers in the media and public debate on nuclear weapons.

Alongside the above-mentioned sources, the study has also made use of other material. The project research group organised a workshop relating to the project themes at FIIA on 13 September 2023. The event was attended by 15 experts from Finland and other Allied nations. Based on presentations given by participants, the workshop discussed trends in NATO's nuclear policy in the changing international nuclear order, the Alliance's decision-making on nuclear policy, and Finland's opportunities to participate in NATO's nuclear deterrence policy and its implementation. The report does not refer directly to discussions that took place in the workshop, but observations raised at the event provide supplementary and in places more in-depth information complementing the primary and secondary material.

To gain background information, the research process also involved numerous discussions in 2023 with representatives of the NATO International Staff, NATO Ally countries and Finnish public officials as well as researchers with expertise in nuclear deterrence in Brussels, Helsinki, Washington and Paris. The discussions were informal background consultations, and the information obtained was utilised alongside other primary material and existing research literature. More importantly, views gained from the background discussions were also useful in the interpretation of primary material.

2 International nuclear order and arms control architecture

2.1 Components of the international nuclear order

NATO's nuclear policy – particularly the nuclear sharing arrangements and extended deterrence practice as its integral elements – should be understood as part of the broader international nuclear order. The international nuclear order is a concept consisting of military practices and technological factors maintaining nuclear deterrence and, on the other hand, of regulatory systems and norms moderating the political effect of nuclear weapons. The nuclear order is not an institution or a binding agreement negotiated by state actors at a specific point in time. Rather, it is about constantly evolving yet at the same time historically relatively well-established notions and courses of action associated with the global significance of nuclear weapons that started to take more permanent shape from the 1960s onwards.[9]

From the very beginning, the formation of the nuclear order has involved the challenge posed by dual-capable technology: applications of nuclear physics can be used in energy production as well as for military purposes. This means the nuclear order inherently involves a balancing act between the massive destructive potential of nuclear weapons and the peaceful employment of nuclear power and technology. From this perspective, the nuclear order is a historical amalgamation of state practices, norms, arms control treaties and other agreements, based on which efforts have been made to manage the dual-capability challenge and the related power-political tensions. Ultimately, ensuring the survival of humanity and the prevention of a nuclear war can be regarded as the primary goal of the nuclear order.[10]

Negotiated in the UN in 1968 and in force since 1970, the Treaty on the Non-Proliferation of Nuclear Weapons (NPT) was based on the recognised need to agree on ways in which the society of states could manage the above-mentioned dual-capability challenge. From the NPT perspective, the nuclear order is hierarchical by

9 Nuti, 2018, pp.965–66.

10 Walker, 2000, pp.706–07.

nature. Under the NPT, only five states that had successfully conducted a nuclear weapons test by 1967 are recognised by the parties as nuclear-weapon states. Since then, another five countries that are non-NPT parties have acquired nuclear weapons, with South Africa the only one of these that has subsequently voluntarily dismantled them.

NATO's nuclear policy has evolved alongside the international nuclear order, with the relationship between these being characterised by strong historical path dependence. For example, NATO's characteristic "dual-track policy" – emphasising the defensive value of nuclear deterrence while on the other hand promoting the arms control dialogue aiming to reduce the risks arising from nuclear armament – was created while the international nuclear order started taking more permanent shape from the late 1960s onwards.

The main characteristics of the nuclear order can be divided into three key components and respective subcomponents:

1. Deterrence policy practices, related weapons technology developments, and arms control measures, treaties and agreements seeking to maintain strategic balance between nuclear-weapon states.

2. Measures and treaty systems seeking to achieve non-proliferation of nuclear possession, reduce the political significance of nuclear weapons and implement regulation on weapons technology and nuclear material.

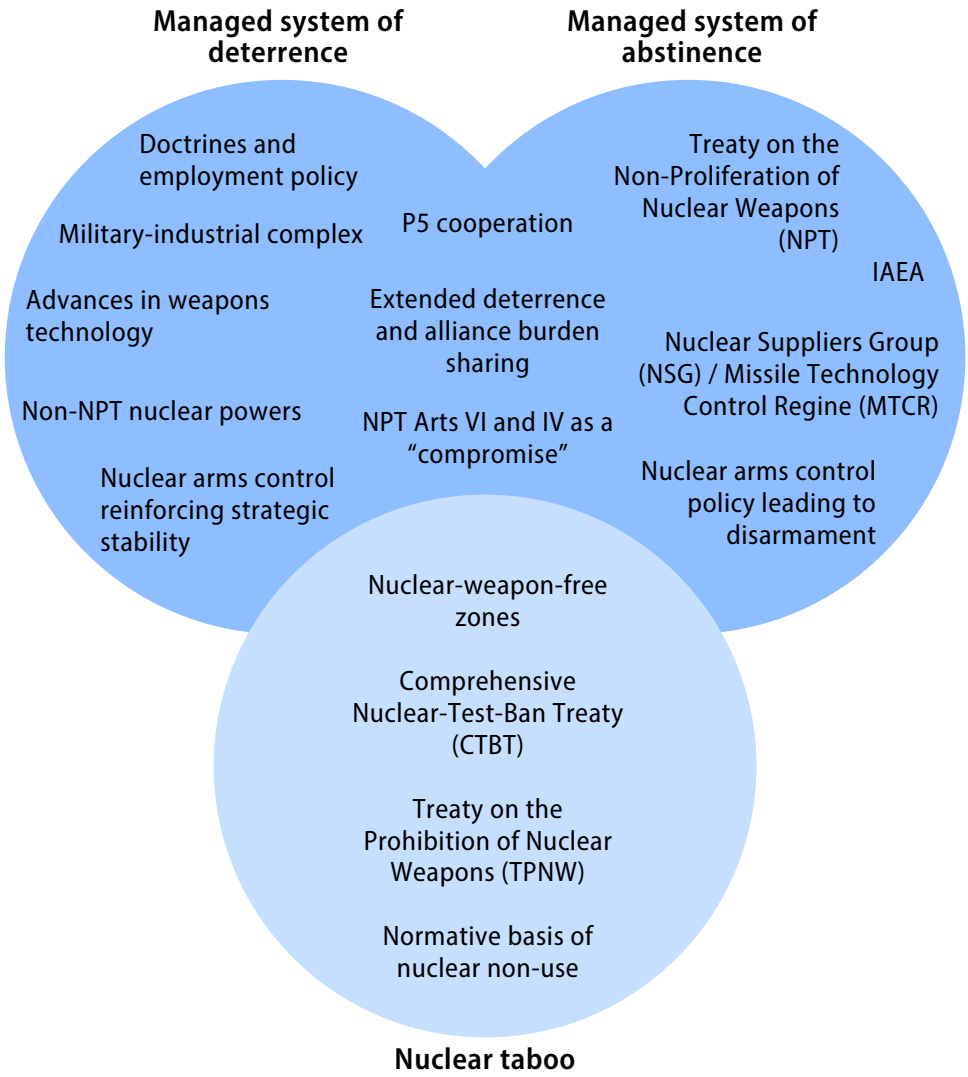
3. Norms such as the nuclear taboo emphasising a high threshold for use of nuclear weapons as well as practices and treaty systems supporting these.

The interrelationship between deterrence policy and measures to moderate the effect of nuclear weapons plays a key role in NATO politics too. Over the decades, this has been visible in the debate within the Alliance on how to balance between strengthening deterrence and conducting policy dialogue on arms control. The development of NATO's nuclear sharing programme and related issues concerning the non-proliferation of national possession of nuclear weapons have historically been intertwined with the development of the international nuclear order (see section 3.6).[11]

11 Alberque, 2017.

This is why it should be noted that NATO's extended nuclear deterrence and the Alliance's joint nuclear planning from the 1960s onwards were for their part interwoven with efforts to prevent nuclear proliferation. As a NATO member, Finland's foreign and security policy is now more comprehensively intertwined with the basic pillars of the international nuclear order mentioned above: alongside the traditional profile emphasising the stabilising effect of the NPT and arms control treaties and agreements, Finland is now also relying on the extended nuclear deterrence of NATO's nuclear-weapon states as part of its security policy.[12]

Figure 1. International nuclear order and its three intertwined components (adapted from Walker, 2000; 2012; Knopf, 2022; Budjeryn, 2022; Iwama, 2023; original figure in Juntunen, 2024)



12 Pesu and Juntunen, 2023.

2.2 NATO, the Treaty on the Non-Proliferation of Nuclear Weapons and the international nuclear order

Perhaps the best-known model of the features of the international nuclear order has been presented by William Walker in his book *A Perpetual Menace: Nuclear Weapons and International Order* (Routledge, 2012). Walker defines 'international nuclear order' as entailing evolving patterns of thought and activity the primary goal of which is the survival of the world and humanity, avoidance of war and, on the other hand, the use of nuclear technology as a tool for economic development.[13]

According to Walker, the international nuclear order offers states the opportunity for the quest for a *tolerable accommodation* of tensions and uncertainties in their relationships with each other arising from the differences in the capabilities, practices, rights and obligations caused by regulation of the existence of nuclear weapons.[14] Consequently, the nuclear order does not refer to any regime or treaty consciously designed by states. Instead, it is a process continuously evolving along with the more general power relations of world politics and changes caused by technological advances.

13 Walker, 2012, p.12. In defining 'order', Walker follows the theoretical tradition of the English School of international relations theory, which does not associate 'order' with hegemony but, instead, takes account of the society of states possibly also having some fundamental shared goals that the order with its conventions supports (see also Iwama, 2023).

14 Ibid. Walker's definition in full (italics in the original): "*Given the existence of nuclear technology, the international nuclear order entails evolving patterns of thought and activity that serve primary goals of world survival, war avoidance and economic development; and the quest for a tolerable accommodation of pronounced differences in the capabilities, practices, rights and obligations of states*". Walker's definition elaborates on the conception of the nature of international order made known by Hedley Bull (2002 [1977], p.10), one of the key theorists of the English School of international relations. Here, inter-state politics takes place in a space that is anarchical by nature. While international politics is characterised by anarchy and the ensuing power imbalances, political units consisting of human individuals may, regardless of this, develop and form sets of rules, conventions and norms that at least in part regulate the activities of the society formed by states.

In his original work, Walker divides the international nuclear order into two mutually dependent systems: *managed system of deterrence* and *managed system of abstinence* seeking to mitigate and reduce the role of nuclear weapons in world politics.[15]

The managed system of deterrence involves the material reality of nuclear weapons – the hardware of nuclear weapons and nuclear explosives, the means of delivery (delivery vehicles) of nuclear weapons, the command-and-control systems relating to nuclear weapons systems, intelligence systems and the characteristics of advances in weapons technology relating to all of the above. In addition, the system of deterrence involves the cultural understandings adopted from deterrence theories and the practices of deterrence policy (see section 3.1). It is through these that nuclear powers operationalise their nuclear doctrines as well as regulate and develop the composition and deployment of their nuclear forces. The managed system of deterrence thus provides nuclear-weapon states an increasingly controlled and rule-bound framework, based on mutual vulnerability and restraint, to prevent war and maintain stability.[16]

15 Walker, 2000, p.706. Professor Jeffrey Knopf (2022) has recently examined the global nuclear order as a whole consisting of three or four interwoven strands: strategic stability, the nuclear taboo and nuclear non-proliferation (understood in the broad sense). A similar analysis has been applied by Nicola Horsburgh (in Knopf, 2022, p.188), who identifies nuclear deterrence, arms control, non-proliferation and disarmament as the elements of the international nuclear order. On the other hand, the latter three of these elements can also be viewed as an amalgamated whole.

16 The nuclear deterrent – or the threatened use of nuclear weapons – can also be employed as a tool for military or diplomatic blackmail. A recent example of this has been seen in Russia's multiple threats of using nuclear weapons in conjunction with the illegal war of aggression against Ukraine. It is, however, somewhat controversial to claim that there are conventions or understandings of nuclear blackmail shared by the society of states, as this is not about maintaining strategic balance (for the differences, see Sechser and Fuhrmann, 2017). Rather, it can be said that the reinforcement of the nuclear taboo (see below) has had a negative effect on the acceptability of nuclear blackmail, too. Correspondingly, nuclear blackmail has proved historically to have very little utility as an instrument in power politics. This is a logical consequence from the nuclear order perspective, as the detonation of a nuclear weapon for blackmail purposes would break the nuclear taboo in a way that would result in a no less than a glaring imbalance between the political benefits sought and the consequences of the act for the society of states (bearing in mind that the ultimate aim of the nuclear order is to prevent nuclear war and, to a slightly lesser extent, to prevent the use of nuclear weapons for hostile purposes).

In addition to nuclear weapons, deterrence conceptions and weapons technology, Walker includes in the system of deterrence the measures and arrangements based on which nuclear powers seek, through diplomatic means, to prevent any misinterpretations concerning nuclear weapons, to manage risks and to exercise preventive control of potential crises. The system also includes such arms control arrangements between nuclear powers that seek to reduce the likelihood of a sense of mutual threat and misinterpretations, but that do not necessarily lead directly to disarmament.

Arms control often relates specifically to the management of the system of deterrence, which in practice means *arms control for strategic stability*, that is, pursuits of nuclear powers arising from their own interests to reinforce strategic stability between them and the symmetricity of deterrence policy. On the other hand, arms control may also seek disarmament. This is when arms control treaties and agreements directly seek to dismantle nuclear weapons or related systems. This can be pursued, for example, by agreeing on reductions in and dismantling of nuclear weapons systems that feed instability or even on the banning of certain technologies, that is, by implementing *arms control for abolition*.[17]

Thus, the system of deterrence also involves a shared understanding that the erosion of the mutual vulnerability between nuclear powers could lead to catastrophic consequences to humanity. In this respect, the preventive or restraining logic of nuclear deterrence is based on the risks involved in the potential use of nuclear weapons and the politico-psychological effect of their destructive power.

Walker calls the other system of the international nuclear order 'a managed system of abstinence'. Here, Walker does not refer to the cultural tradition of non-use of nuclear weapons or the norm of the nuclear taboo as such. Instead, he points out that this concerns the grand bargain between the recognised nuclear-weapon states and states that have undertaken not to have nuclear weapons that is at the core of the NPT.

17 See Budjeryn, 2022.

Strategic stability

Since the turn of the 1950s and 1960s, 'strategic stability' has referred to the scenario typical of the nuclear era where no nuclear-weapon state regards it, due to the high risk of nuclear retaliation against itself, as worthwhile to undertake the preparation of striking first with a nuclear weapon in order to paralyse the other side's capacity for action and counterstrikes. In this narrow meaning, the situation referred to as 'strategic balance' arises when the adversaries recognise that they have a survivable second-strike nuclear capability (crisis stability).

In addition to this, strategic stability is also affected by other pragmatic, domestic political and moral factors that provide a disincentive for state actors to be the first to use nuclear weapons in a crisis.

Moreover, the strengthening of strategic stability has subsequently involved arms control measures which, on the one hand, may maintain and even reinforce the reciprocal significance of nuclear deterrence but also disincentivise the development of such new nuclear weapons systems that might undermine trust in mutual vulnerability.

There is no clear consensus on the concept of strategic stability in academic debate – let alone in practical great-power politics. For example, Russian commentary has featured the concept of strategic stability to more generally describe the status of the relations between Russia and the West. China, in turn, has stressed the relationship of reciprocal nuclear vulnerability traditionally associated with the concept.

Sources: Colby & Gerson, 2013; Claeys & Williams, 2022; Kühn, 2023, p.2.

The key aim of the NPT is to prevent the materialisation of the risks posed to international security by the proliferation of nuclear weapons. Under this aim, the majority of the world's states have waived their sovereign right to develop and control certain dual-capable technologies enabling military applications (including for defensive purposes). The signatory states guarantee, for the states that had successfully conducted a nuclear weapons test by 1967, the right to possess nuclear weapons without a time limit associated with this privilege.

In return, the states undertaking to remain as non-nuclear-weapon states receive support from all of the signatory states for the peaceful use of nuclear energy, various levels of security assurances provided by recognised nuclear-weapon states, and other normative and pragmatic benefits. In addition, under Pillar 2 of the NPT, the signatories to the NPT, including the five nuclear-weapon states recognised in the treaty, undertake to pursue negotiations in good faith towards complete nuclear disarmament.

Three pillars of the NPT

Non-proliferation of nuclear weapons (Articles I–II): the non-nuclear-weapon signatory states undertake not to obtain nuclear weapons; the nuclear-weapon signatory states undertake not to transfer nuclear weapons to any other states or to assist them in the manufacture of their own nuclear weapons.

Use of nuclear energy for peaceful purposes (Article IV): nothing in the treaty may prevent the Parties from developing, producing or using nuclear energy for peaceful purposes; the Parties undertake to support each other in the development of scientific and technological information relating to this.

Nuclear disarmament (Article VI): each of the Parties to the treaty undertakes to pursue negotiations in good faith relating to cessation of the nuclear arms race and to nuclear disarmament, and on a treaty on general and complete nuclear disarmament under international control; this also applies to the five nuclear-weapon states defined in the treaty.

Walker associates the security assurances of the nuclear-weapon states, particularly the "positive security assurances", with the system of abstinence. Of these, the best-known practice is *extended deterrence*, the key appliers of which have been the United States and NATO (see Chapter 3). The connection of extended deterrence with the system of abstinence is linked, in NATO's history, with the United States seeking during the 1960s and 1970s by means of its positive security assurances to reassure several Western European countries that they have no need to develop their own nuclear weapons programmes (see section 3.6).[18]

Some literature has separately identified nuclear disarmament and the nuclear taboo as the third component of the international nuclear order.[19] In simplified terms, 'the nuclear taboo' is based on a culturally shared understanding of nuclear weapons being always considered, regardless of their explosive yield, as fundamentally different from conventional weapons. The idea of the existence of the nuclear taboo is therefore based on an understanding of the moral pressure and obligation of not using nuclear weapons in conjunction with crises and wars.

Even though the United States used nuclear weapons in the war against Japan on two occasions in August 1945, since then the understanding of their massive destructive force potentially posing an existential threat to humanity has become stronger and clearer; the threshold for being the *first* to use nuclear weapons with lethal intent has become morally almost insurmountable. In other words, the mere moral burden that can be anticipated to result from detonating nuclear weapons in a war situation and the global condemnation that would ensue have established the understanding in relations between states of the limited utility of nuclear weapons as instruments of force.[20]

18 Walker, 2000, p.707. 'Positive security assurances' refer to pledges made by nuclear-weapon states to provide assistance to a non-nuclear-weapon state in the case of an armed attack. The pledge may be provided under a formal agreement or be informal, in addition to which there may be variation in the level of precision as regards the definition of the threshold for use of armed force required for the pledge to be honoured. 'Negative security assurances' in turn mean that a state pledges not to threaten to use or to use nuclear weapons against a non-nuclear-weapon state. Historically, nuclear-weapon states have sought to encourage non-nuclear-weapon states by means of both positive and negative security assurances to not obtain nuclear weapons (see Tetrais, 2011).

19 See e.g. Knopf, 2022; Budjeryn, 2022. See also Tannenwald, 2007.

20 Tannenwald, 2007.

The concept of 'the tradition of non-use of nuclear weapons' has also been used to refer to the nuclear taboo.[21] In contrast to the nuclear taboo, the perspective with the non-use of nuclear weapons is not so much to explain the phenomenon as resulting from a morally binding normative effect. Instead, it is examined as state practice that has emerged from a number of precedents. Many of the precedents influencing the non-use tradition were also set during the Cold War. For example, the decision of President Dwight D Eisenhower and the US administration not to use nuclear weapons as a solution to the Korean War in the early 1950s or later to solve the crises in Indochina and the Taiwan Straits are referred to in the literature as precedents solidifying the non-use tradition.

Considering the existence of the nuclear taboo and the non-use tradition, it appears, however, counter-intuitive that nuclear-weapon states have, particularly from the 1970s onwards, put a great deal of effort in maintaining sufficiently credible deterrence based on the potential use of nuclear weapons. Nuclear-weapon states have developed flexible retaliation options, limited nuclear war concepts and escalation control options, manufactured relatively low-yield "mini-nukes" and sought to control and minimise the radiation and other environmental impacts of detonation of nuclear weapons.

Put simply, it could be argued that, if the nuclear taboo in itself was to explain the period of nearly 80 years of non-use of nuclear weapons, the nuclear powers would be likely to regard their deterrence as credible with considerably more limited nuclear capability. Nevertheless, the threshold for hostile nuclear employment has remained extremely high, with this undoubtedly having been influenced also by moral obligations and cultural understandings of the nature of nuclear weapons.

It should also be noted that the nuclear-weapon states recognised under the NPT (the P5 states) have subsequently indirectly acknowledged the existence of the nuclear taboo in their several joint statements where they have underlined that a nuclear war cannot be won and must therefore never be fought.

21 Paul, 2009. In the nuclear taboo context, the use of nuclear weapons refers to their detonation for hostile purposes in crisis situations or warfare. This of course does not rule out the fact that nuclear-weapon states continuously use nuclear weapons as their foreign and security policy tools ranging from status-related pursuits to nuclear deterrence and blackmail policy.

On the other hand, the nuclear-weapon states seek to reinforce the credibility of their nuclear deterrence with doctrinal wordings reserving the option of the first use of nuclear weapons against other nuclear-weapon states and possibly also against their allies. The aim is not only to manipulate the adversaries' risk assessments so that other states are not tempted to use nuclear weapons in war situations, but also to protect themselves against nuclear blackmail.

The first-use option plays a particularly important role for such regional nuclear-weapon states that regard a more powerful regional power or great power as an acute threat to national security. For example, Pakistan's nuclear deterrence is based on the threat of asymmetric escalation, whereby the country is prepared to use low-yield battlefield nuclear weapons already at an early stage of a conflict against India's conventional forces.[22]

Conceptual difference between nuclear blackmail and nuclear deterrence

'Nuclear deterrence' refers to a policy employed by states to prevent hostile acts by adversaries by threatening them with the high cost of aggression. 'Nuclear blackmail' in turn is about threatening the first use of nuclear weapons in a way that seeks to extract proactive political and military concessions from an adversary. Roughly speaking, this means that the coercive policy of nuclear blackmail uses active threats to the adversary in order for the blackmailer to gain something it does not yet have (such as diplomatic concessions, unilateral disarmament by the adversary, territorial cession, etc.), whereas nuclear deterrence refers primarily to safeguarding and maintaining something already held. Both strategies aim to achieve political goals without resorting to executing the threat made. In other words, they are about risk manipulation. In real-life politics, nuclear deterrence and nuclear blackmail can also be intertwined.

22 Narang, 2014, Chapter 3.

Historically, nuclear blackmail has proved to be a rather poor instrument in power politics. This is partly due to the moral burden arising from the nuclear taboo – threats concerning the use of nuclear weapons in a situation where the aim is to achieve, for example, political concessions or territorial cession with secondary significance to national security interests suffer from a deficit of moral and political credibility. The negative consequences of nuclear first use in terms of domestic and alliance politics would most likely be substantial. In addition, nuclear blackmail involves the problem of military redundancy: in most cases, the demands made by the blackmailer, especially threats made against smaller non-nuclear-weapon states, could be imposed by means of clearly smaller threats based on conventional capabilities. The credibility of nuclear blackmail against another nuclear-weapon state in turn is reduced by the adversary's nuclear deterrence, that is, the chance of retaliation, depending slightly on the ratio of nuclear capabilities possessed by the states.

Source: Sechser and Fuhrmann, 2017.

The majority of nuclear-weapon states do not, however, categorically rule out the option of nuclear first use in their nuclear doctrines. US President Joe Biden stated in his presidential election campaign in 2020 that he supports the application of the "sole purpose" policy in US nuclear policy. This would have meant reserving nuclear weapons for the sole purpose of deterring a nuclear attack and, if necessary, to retaliate for a nuclear attack. Following Russia's invasion of Ukraine and the numerous instances of nuclear blackmail by the Russian leadership, the most recent US nuclear doctrine and defence strategy retains the nuclear first-use option in extreme circumstances.[23]

23 Among the current nuclear-weapon states, only China excludes the first use of nuclear weapons in its declared nuclear doctrine. In other words, China's nuclear deterrence is built on "assured retaliation", which seeks to prevent any first use of nuclear weapons by an adversary (see Narang, 2014, Chapter 5.) On the other hand, Chinese authorities have expressed in private conversations that China would consider nuclear first use in case of a conventional attack against its nuclear forces (Kristensen, Kodra and Reynolds, 2023). India has also long maintained an official no-first-use policy. In 2003, however, it announced that it reserves the option to retaliate with nuclear weapons in the event of a chemical or biological weapons attack. Experts have viewed India's no-first-use declaration with some scepticism in other respects too (see Kristensen and Kodra, 2022, pp.226–27). The Soviet Union also declared a no-first-use pledge in 1982. Russia abandoned this pledge in 1993.

The components of the international nuclear order are mutually interdependent. As a military alliance, NATO's joint nuclear policy and the national-level nuclear policies of its nuclear-weapon states are also intertwined with the systems of the international nuclear order. From this perspective, NATO's nuclear policy should also be examined as a whole that does not boil down exclusively to deterrence policy practices.

Just as in debate within NATO between advocates of arms control initiatives and those seeking to reinforce deterrence, there are potential tensions between the systems of the international nuclear order, too; the reinforcement of one component may cause unwanted disorder in another component of the order. In a somewhat similar manner, advocates emphasising arms control initiatives or reinforcing deterrence can be identified in NATO's internal debate.

The non-proliferation of nuclear weapons can also be promoted not only by diplomatic and rules-based means but also through the use of force, such as by carrying out a military intervention to destroy the infrastructure of a clandestine nuclear weapons programme prepared by a non-nuclear-weapon state. This, in turn, may lead other state leaders, concerned about a decline in their security status, to believe they need to strengthen their own nuclear weapons programmes or existing deterrence capabilities.[24] An increase in the number of regional nuclear-weapon states emphasising the potential first use of nuclear weapons may in turn have a negative impact on regional and strategic stability, the outlook for nuclear disarmament and even the moral foundation of the nuclear taboo.

Correspondingly, for example, at the turn of the 1960s and 1970s, the outlook for missile defence systems development affected the arms race where both main parties to the Cold War initiated major investment in developing the survival and

24 Narang and Sagan, 2022, pp.248–49. Israel's measures to end the nuclear weapons programmes of Middle Eastern states can be mentioned by way of example here. Israel's most recent target has been the clandestine nuclear weapons programme prepared by Bashar al-Assad in Syria, with Israel's military strike destroying an unfinished nuclear reactor playing a key role for the programme in 2007. Israel had previously, in 1981, destroyed the Osirak nuclear reactor near Baghdad in Iraq in a similar way. The United States in turn negotiated with Muammar Gaddafi, the then leader of Libya, and persuaded him to surrender Libya's struggling nuclear weapons project in 2003 (see Narang, 2022, pp.309–16). In the light of current information, the original aim of both Syria and Libya was to reach nuclear capability instead of seeking to use the nuclear weapons programme developed to the threshold stage mainly as tool for political and diplomatic blackmail without any actual aim to develop operational nuclear weapons.

penetration capability of their offensive arsenal. Such a state of affairs turning into a full-blown arms race may result in a security paradox where the objective security status of all parties declines regardless of their subjectively defensive intentions.[25] Any further uncontrolled development of such a situation erodes confidence in the existence of reciprocal vulnerability and the significance of the nuclear taboo.

2.3 Birth of the Treaty on the Non-Proliferation of Nuclear Weapons and NATO's extended deterrence

The international nuclear order took shape in the 1960s and was established further in the 1970s as part of the broader changes associated with the international system and great-power politics. The Treaty on the Non-Proliferation of Nuclear Weapons (NPT), which would later form the foundation of the nuclear order, was negotiated in the UN in the 1960s. The treaty was a historic achievement, as efforts to solve the nuclear proliferation problem and the challenges related to the international control of nuclear technology had been made unsuccessfully since the late 1940s.

The nuclear weapons monopoly enjoyed by the United States since World War II eroded gradually at the turn of the 1950s, as the Soviet Union succeeded, contrary to the expectations of many, in making progress towards catching up with the United States in the field of nuclear weapons. The Soviet Union's first test of a hydrogen bomb, which took place in August 1953 (with the United States having conducted a similar test in November 1952), strengthened the view that world politics had entered into an age of a bipolar system shadowed by the threat of nuclear weapons.

Massive atmospheric nuclear testing causing major environmental damage, public nuclear threats in conjunction with events such as the 1956 Suez Crisis, and the general prospect of the potential spread of nuclear ownership increased international pressure to manage the nuclear weapons problem towards the late 1950s. In addition, the leaps made in missile and submarine technology at the turn of the 1950s and 1960s increased the mutual vulnerability of the nuclear-weapon

25 Booth and Wheeler 2008, p.9, pp.115–17.

states. At the turn of the decade this was manifested in reciprocal political decisions to refrain temporarily from atmospheric nuclear tests (a moratorium on nuclear testing).[26]

The physical size of nuclear warheads was also rapidly becoming smaller, which enabled their more flexible placement in available delivery vehicles (means used to deliver nuclear weapons to their targets).[27] The rapid leaps made in nuclear weapons technology and the reciprocal vulnerability reinforced by them was not, however, automatically embedded as a pragmatic understanding shared by the great powers. The idea of maintaining a strategic balance, which has subsequently played a key role in the nuclear order, only started to gain increasing attention in the 1960s following the Cuban Missile Crisis.

The Cuban Missile Crisis awakened the leading nuclear powers to the importance of risk management relating to nuclear weapons, too. Even amidst the deep ideological and political power struggle, the United States and the Soviet Union recognised their mutual interest to seek to prevent any unintentional misinterpretations leading into the use of nuclear weapons in the context of crises. The development of crisis management mechanisms contributed towards higher predictability of deterrence policy and strategic stability.

In the early 1960s, France and China joined the club of nuclear-weapon states alongside the United States, the Soviet Union and the United Kingdom. At the same time, many other countries, including several allies of the United States

26 The United States and the Soviet Union agreed politically – but not under a treaty – on a moratorium on nuclear testing in 1958. The moratorium was, however, unilaterally ended by the Soviet Union, following the loss of prestige it suffered in the Berlin Crisis, as it resumed atmospheric nuclear testing in September 1961. These included perhaps the biggest and most destructive propaganda show during the Cold War, as the Soviet Union detonated a massive nuclear weapon with a yield of more than 50 megatonnes over Novaya Zemlya. Correspondingly, the United States conducted its first nuclear tests in outer space in the following year. Rather soon and also in part surprisingly from the perspective of contemporaries, international pressure resulted in August 1963 in the Partial Nuclear Test Ban Treaty (PTBT) signed in Moscow by the United States, the Soviet Union and the United Kingdom, banning nuclear weapon tests in the atmosphere, in outer space and under water.

27 For example, from the mid-1950s onwards, the United States deployed to West Germany nuclear weapons that could be fired with field guns or even grenade launchers and the ranges of which were only a few kilometres at their shortest. The smallest nuclear warheads, such as the W54 tactical nuclear warhead designed to be launched from a grenade launcher, were already so light by the start of the 1960s that they could be carried around by individual infantrymen.

and the Soviet Union, were "nuclear threshold states". Accordingly, contemporary debate in the early 1960s featured authoritative scenarios predicting the number of nuclear-weapon states to increase manyfold already during the next decade if the international community and leading nuclear powers did not take speedy measures to prevent nuclear proliferation.[28]

The prospect of potentially dozens of nuclear-weapon states was a multidimensional challenge for the United States and the Soviet Union alike, which also aligned their interests. On the one hand, the issue was cohesion management in terms of alliance politics in Europe and, on the other hand, an ideological and political power struggle elsewhere in the world. The spread of nuclear ownership would have threatened the status of the two leading nuclear powers at the top of the international nuclear pecking order.

The maturation of the system of deterrence was manifested by an approach emphasising strategic balance between the leading nuclear powers, which was based on a recognised capacity for assured retaliation by means of nuclear weapons. This was assumed to disincentivise carrying out an extensive first strike aiming to disarm the adversary's nuclear capacity. Reciprocal vulnerability to assured retaliation increased, as nuclear warheads could be delivered to their target much faster while at the same time it was easier to hide nuclear launch platforms in locations such as oceans.

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28 The most famous of these is probably the March 1963 comment made by US President John F Kennedy, warning of the possibility that in the 1970s there may be 15 to 25 nuclear-weapon nations if no treaty is arrived at on the matter (see Pilat & Busch, 2015, pp. 1–2). According to Narang (2022), there are 29 states in history that have pursued active nuclear weapons programmes. A total of ten nuclear weapons programmes have ended up acquiring operational nuclear capacity. Of these, only South Africa voluntarily dismantled its indigenously produced nuclear weapons in the early 1990s (Harris et al., 2004). In May 1992, Belarus, Ukraine and Kazakhstan signed the Lisbon Protocol, under which they promised to surrender the nuclear weapons systems from their territory to Russia, which was recognised as the sole inheritor of the Soviet nuclear arsenal, and to accede to the NPT as non-nuclear-weapon states (Budjeryn, 2023, par. 3). It should also be noted that the strategies underlying nuclear programmes have varied considerably from case to case. Narang breaks these down into four categories: the first five nuclear-weapon states were *sprinters*; Israel, North Korea and Pakistan adopted a *sheltered pursuit* strategy under a superpower patron; states without a major power shelter but with a clear goal of acquiring operational nuclear capacity, as was the case with Syria and Iraq, pursue a *hiding* strategy; a strategy of *hedging* is employed by a large number of states that have been preparing clandestine potential to attain nuclear capacity (a kind of nuclear weapons option) to increase their room for manoeuvre in security policy but have for various foreign and domestic policy reasons consciously decided not to produce nuclear weapons.

Any changes in the components of the international nuclear order and their interrelations have subsequently mainly been gradual since the Cold War. In this respect, the history of the nuclear order is characterised by the focus shifting between periods emphasising the significance of deterrence and periods emphasising nuclear disarmament. Regardless of the major technological advances made, many of the phenomena, practices and cultural assumptions relating to nuclear policy can still, however, be explained through the norms, treaties, agreements and power configurations created during the Cold War.

As regards NATO's deterrence policy, a key example is its nuclear sharing arrangements and related consultation practices (see section 3.6). Historically, these relate to the connection between debate on the Alliance's political, military and moral burden-sharing and, on the other hand, the key role of the NPT. It is therefore particularly important to take account, in the context of NATO's nuclear policy and deterrence, of the interconnectedness between the sub-systems of the nuclear order.

In historical summary, this is a process that took place from the late 1950s until the late 1960s, owing to which the nuclear deterrence of the United States in particular was institutionalised as part of NATO's preventive defence in Europe (see section 3.2). The nuclear umbrella provided by the United States for Europe and the multilateral talks on its credibility ultimately convinced countries such as West Germany and Italy that they had no reason to obtain independent nuclear capability against the threat they perceived to be posed by the Warsaw Pact.[29]

At the same time, after the mid-1960s, the U.S. and the Soviet Union reached a consensus that the nuclear sharing and consultation procedures now associated with the practice of extended deterrence were not in conflict with the NPT and nuclear non-proliferation. The key issue was that the recognized nuclear-weapon states should maintain peacetime military control over nuclear weapons.[30]

The process towards the NPT, which was passed in 1968 and entered into force in 1970, was, however, first triggered already in October 1958 when Irish Minister for External Affairs Frank Aiken proposed at the UN a draft resolution on the opening of negotiations concerning a treaty on the non-dissemination of nuclear weapons.[31] The United States initially had reservations about the initiative; the Eisenhower administration found that the "Irish Resolution" would jeopardise the right of the United States to deploy nuclear weapons in Europe, which it had been doing since 1954.

29 Sayle, 2020.

30 Alberque, 2017.

31 Choussudovsky, 1990.

However, the amendments to the resolution text made in the subsequent years persuaded both the European NATO member states as well as the John F Kennedy administration to endorse it. A key role in this was played by changes of wordings whereby the focus was put on the idea of not relinquishing national control over nuclear weapons (as an obligation of nuclear powers) and, in return, the responsibility "not to accept control" of nuclear weapons (as an obligation of non-nuclear-weapon states).[32]

The rewordings of the Aiken resolution allowed the U.S. to interpret that the existing NATO nuclear sharing arrangements wouldn't conflict with a treaty potentially negotiated later. This required NATO's internal arrangements to make sure the United States would maintain launch control over nuclear weapons deployed in Europe.

The amendments made to the Aiken resolution already in the early 1960s would subsequently also form the basis of the consensus reached by the United States and the Soviet Union on the draft of the NPT.

The Soviet Union wanted to make sure NATO's internal nuclear sharing arrangements and consultations would not under any circumstances lead into West Germany's independently controlled nuclear capability. The United States agreed to this, despite the abandoning of the plans to establish a multilateral nuclear force for NATO raising suspicions in West Germany in particular as to the commitment of the United States to defending the Europeans.

Following lengthy negotiations, the United States in turn received guarantees from the Soviet Union that the existing nuclear arrangements of the United States and NATO in Europe would not be in conflict with the NPT. In this respect, the consensus between the United States and the Soviet Union was based on the text of the treaty covering only what is prohibited. Anything that might specifically be permitted was omitted from the text.

In addition, the Soviet Union and the United States agreed that the draft for the NPT would be formulated on the basis that it only governs peacetime relations between states. The United States did, however, already at the negotiating stage ensure from the Soviet Union that the consultation arrangements relating to NATO's collective nuclear planning and the option to deploy new nuclear weapons to Allies would

32 Burr, 2018.

be available in the future, too.[33] At this point, Washington had already become aware of how important many European Allies regarded the continuous and active consultations relating to nuclear planning (see section 3.6.1 below).

A key issue was also that the Soviet Union and the United States agreed that the NPT only applied to nuclear warheads. This means the NPT did not restrict allies' right to, for example, missile system ownership and exercises, provided that the systems would not contain nuclear warheads and provided that control over nuclear weapons would remain in all circumstances with the nuclear-weapon states recognised by the treaty.[34]

2.4 NATO's dual-track policy and the golden era of nuclear disarmament

The consensus reached by the United States and the Soviet Union on the first draft on the Treaty on the Non-Proliferation of Nuclear Weapons (NPT) in late summer 1967 was one of the first signs of détente between the superpowers. Despite the Soviet invasion of Czechoslovakia and the still ongoing Vietnam War, the policy of détente also cascaded down from superpower relations to Europe. Over a brief period lasting a few years, speedy progress was made in negotiations towards the recognition of the two German states and the arrangements for a European Security Conference. At the same time, the United States and the Soviet Union for the first time entered into negotiations towards a treaty on the control of the composition of strategic nuclear forces and missile systems (negotiations commenced in Helsinki in 1969).

The "dual-track approach", by which NATO's nuclear policy has subsequently long been characterised, was developed during that same period of transformation. The impetus for the dual-track approach is often credited to the programme of work initiated in 1966 by Pierre Harmel, the Belgian Minister of Foreign Affairs. The purpose of the programme was to review the tasks and consider the future of NATO, which was approaching its 20th anniversary. Also underlying the programme was the decision made by de Gaulle's France in 1966 to pull out from NATO's military structures.

33 Alberque, 2017, pp. 35–40.

34 Alberque, 2017, pp. 26–47.

Implemented by the North Atlantic Council and chaired by the Secretary General of NATO, the work of representatives designated by governments took place under four sub-groups. The Report of the Council on the Future Tasks of the Alliance was published in December 1967. Its guiding idea was to combine stronger deterrence with promoting political détente. As regards nuclear policy, this subsequently meant a combination of reinforcing nuclear deterrence and focusing on arms control to reduce risks – a dual policy reflecting the relationships between the components of the international nuclear order.

The dual-track policy faced a baptism of fire already in the late 1970s, as NATO decided, following lengthy internal debate, to respond to the threat posed by the advanced and manoeuvrable land-based Soviet SS-20 missiles. In response, land-based intermediate-range US ballistic missile systems and cruise missiles would be deployed in Europe. The other track of the Dual-Track Decision taken by NATO in 1979 entailed, however, that the deployment of US missiles in Europe would commence only in 1983 and only if no progress was made by then in the arms control talks with the Soviet Union to solve the security threats perceived by Western Europe.

The United States and the Soviet Union failed to resolve the ensued crisis through arms control talks. With the talks deadlocked in 1981, the deployment of US missiles commenced in late 1983. The same autumn saw the tensions between the superpowers and, more general, between the member states of NATO and the Warsaw Pact, reach levels higher than ever seen since the Cuban Missile Crisis.[35]

In the early 1980s, numerous anti-nuclear protests were held in Western Europe and the United States. Of the Nordic NATO member states, especially Denmark but later also Norway made several reservations to NATO communiqués concerning nuclear policy during the 1980s.[36] Anti-nuclear public opinion was gaining ground in the United Kingdom, Belgium and the Netherlands, the governments of which had agreed to hosting US Euromissiles on their territory.[37] The implementation of

35 There is a lack of clear understanding in the research literature about the significance of the most intense year of the Euromissile Crisis and the perceived level of threat of war in autumn 1983, which is due particularly to the unavailability of Soviet sources (see Miles, 2020; Barras, 2016). It is, however, known that the period was characterised by reciprocal distrust, which was deepened by the erosion of dialogue between the leaders of the superpowers in the 1980s and by the enemy images prevailing in the intelligence communities on both sides (see Jones, 2016).

36 Juntunen, 2021.

37 Wittner 2009, pp. 144–47.

the decision to deploy the Euromissiles, regardless of the related domestic policy tensions, in a way that did not significantly strain the internal cohesion of the Alliance served as a precedent that was an indicator of the functioning of the dual-track policy.

Although the negotiations to resolve the Euromissile Crisis ended in a deadlock in the early 1980s, they later formed the foundation for the arms control talks in which speedy progress was made in 1986–1987. In the October 1986 summit in Reykjavík, President Reagan and General Secretary Gorbachev already reached an agreement in principle on reductions in their intermediate-range nuclear forces. At this point, the Soviet Union also agreed to negotiate on intermediate-range missiles separately from the talks on defence and space-based systems.[38]

Signed in Washington in December 1987, the Intermediate-Range Nuclear Forces (INF) Treaty was the first arms control treaty in the nuclear era to eliminate and ban a whole class of weapons. The disarmament measures of the INF Treaty also covered all of the US and Soviet conventional ground-launched missiles with ranges of 500–5,500 kilometres. This means the INF Treaty was a treaty linked with the system of abstinence of the nuclear order that reduced and restricted the military and political significance of nuclear weapons.[39] The strict control and compliance procedures with an intrusive verification regime negotiated for the INF Treaty was a genuine breakthrough on the basis of which also subsequent arms limitation talks were conducted.[40]

Negotiated by the Soviet Union and the United States since 1982 and finally signed in 1991, the Strategic Arms Reduction Treaty (START) was in this respect based on the control and verification tools developed in conjunction with the INF. Unlike in the case of the INF, under START the reduction measures applied not only to delivery vehicles (a reduction by around one third) but also to nuclear warheads (around half of the deployed warheads).[41]

38 Sheehan, 1988, p.156.

39 Gassert et al., 2021, p.9.

40 Richter, 2021.

41 Savranskaya, 2015.

The golden era of nuclear disarmament between 1987 and 1994 was complemented by the unilaterally announced yet reciprocally implemented nuclear disarmament measures taken by US and Soviet and later by Russian leaders. These also applied to short-range nuclear weapons systems. In September 1991, President George Bush announced a major nuclear disarmament initiative resulting in the United States withdrawing all land- and marine-based short-range nuclear weapons systems from outside its own territory.

Key terms of the INF Treaty

Signed in 1987, the INF Treaty covered all ground-launched US and Soviet missiles with ranges of 500–5,500 kilometres, regardless of their location. The missiles had to be destroyed by summer 1991. Later, after the collapse of the Soviet Union, the INF Treaty's missiles ban was also applied to the former Soviet states the territories of which had contained Soviet INF systems. Under the treaty, the United States destroyed 403 ballistic missiles and 443 cruise missiles and the Soviet Union 1,757 ballistic missiles and 80 cruise missiles. The parties' right to conduct on-site verification inspections ended in 2001.

Key terms of START I

Under the treaty signed in July 1991, the Soviet Union and the United States agreed on the maximum number of 1,600 deployed heavy bombers, submarine-launched ballistic missiles and intercontinental ballistic missiles, with the agreed maximum number of nuclear warheads set at 6,000. One strategic bomber was counted under START I as carrying one warhead. Full implementation of the treaty was to be achieved by December 2001. As was the case with the INF, compliance with START I was also verified with on-site inspections and shared missile telemetry.

Source: Pifer, 2015, pp. 293–294; Arms Control Association (n.d.), The Intermediate-Range Nuclear Forces (INF) Treaty at a Glance.

From this point onwards, the United States has only deployed non-strategic air-launched nuclear weapons in Europe (see section 3.6.2). The Soviet Union and Gorbachev responded with their own unilateral nuclear disarmament measures, including by withdrawing all deployed Soviet non-strategic nuclear warheads to central storage sites separate from delivery vehicles – a decision that, based on available information, has not been reversed. In addition, the Soviet Union destroyed a significant number of land-based non-strategic nuclear weapons, of which some had been deployed in areas close to Finland, too.[42]

2.5 Strategic stability and arms control in the 2020s

Uplifted by the golden era of nuclear disarmament, the states parties to the Treaty on the Non-Proliferation of Nuclear Weapons (NPT) decided at the 1995 NPT Review and Extension Conference to extend the treaty indefinitely. They also agreed on a resolution emphasising the significance of the nuclear disarmament pillar referred to in Article VI of the NPT as well as concrete steps towards the furtherance of the goals of the treaty (including a comprehensive nuclear-test ban, a ban on the production of fissile material for nuclear weapons, and concrete progress towards complete nuclear disarmament). In addition, the Review and Extension Conference recommended the commencement of negotiations towards the establishment of a Middle East zone free of weapons of mass destruction.[43]

China and France acceded to the NPT in 1992, and Argentina and Brazil, which had been pursuing their own nuclear projects during the Cold War, in 1995 and 1998. Before these, South Africa had already in the early 1990s voluntarily dismantled the rudimentary nuclear weapons it had developed in secrecy. Following an eventful process, the question of who should inherit the Soviet nuclear arsenal was also resolved successfully from the nuclear non-proliferation perspective, as Russia was designated as the sole inheritor of the Soviet nuclear capacity, which meant the number of the nuclear-weapon states did not increase. Subject to a great deal of public debate at the time, the fears of nuclear terrorism and of nuclear materials ending up large scale on the black market did not materialise to the feared extent, either.

42 Koch, 2012. President of the Russian Federation Boris Yeltsin confirmed already in January 1992 the unilateral nuclear disarmament measures carried out reciprocally by Gorbachev and extended them further.

43 Ford, 2015.

These major steps forward made with regard to nuclear non-proliferation suffered a setback, however, in 1998 when both Pakistan and India confirmed their already publicly known nuclear-weapon status by conducting nuclear tests in brief succession. Debate about the aspirations of countries such as Syria, Iraq, Iran, Libya and, in particular, North Korea, to join the "nuclear club" increased after the turn of the millennium. For example, in the 1990s, Libyan leader Muammar Gaddafi managed to acquire the components of an almost fully deployable nuclear programme from black market sources involving the network of AQ Khan, a developer of Pakistan's nuclear weapons programme. However, Libya lacked the technological expertise to implement the programme, which is why, following negotiations with the United States, Gaddafi agreed to roll back the nuclear weapons project in exchange for the economic sanctions against Libya being uplifted[44].

Around the same time, there were increasing calls for the speedier advancement of the nuclear disarmament of the recognised nuclear-weapon states. In 1998, the New Agenda Coalition (NAC) of Brazil, Ireland, Mexico, New Zealand, Slovenia, South Africa and Sweden called for the nuclear-weapon states to commence concrete talks towards complete nuclear disarmament (Slovenia and Sweden have subsequently left the NAC). The emergence of the NAC was a prelude to the conferences on the catastrophic humanitarian consequences of nuclear weapons held in the 2010s and the negotiations leading up to the Treaty on the Prohibition of Nuclear Weapons (TPNW).[45]

In addition to the increased threat of nuclear proliferation, the progress made after the mid-1990s in arms control talks between the leading nuclear powers and in the new reduction measures taken on the basis of the talks was clearly slower and more cautious than during the preceding era. The decision announced by the United States in late 2001 to withdraw from the Anti-Ballistic Missile Treaty (ABM) signed in 1972 foreshadowed not only a change in the perceived threat associated with nuclear weapons but also a period of more constrained relations between the leading nuclear powers. The United States argued its decision on the basis of a missile threat from "rogue states" in the climate following the 9/11 terrorist attacks on the United States in 2001.

44 Narang, 2022, pp. 309–310

45 Nuclear Threat Initiative, 2023.

Nevertheless, in early 2002 the United States and Russia managed to negotiate the Strategic Offensive Reductions Treaty (SORT), which superseded START II signed in 1993. Under SORT, the operationally deployed strategic nuclear arsenal of both countries was reduced further from START I to 1,700–2,200 nuclear warheads by 2013. At the same time, an extension to START I was agreed. SORT did not, however, address the total number of nuclear warheads (including nuclear warheads in storage) or include any verification regimes typical of effective arms control mechanisms. On the other hand, the United States and Russia established, in conjunction with SORT, the Bilateral Implementation Commission (BIC) concerning the treaty.[46]

In 2006, the United States and Russia launched preparations for negotiations on an extension to START I, which was set to expire in December 2009. The negotiations were a success and resulted in New START signed in Prague in April 2010.[47] In early 2021, only two days before the expiry of the treaty, newly elected President Joe Biden and President Vladimir Putin exchanged notes extending New START by five years. The option for this procedure had already been agreed in the original treaty. In November 2022, however, Russia violated the treaty by announcing at the last moment that it would not participate in the already agreed meeting of the Bilateral Consultative Commission (BCC) in Egypt. BCC activities had been on hold due to the pandemic for more than a year.

Key terms of New START

Signed in 2010, New START specified the further reductions and respective limits for both deployed nuclear warheads (1,550 nuclear warheads) and the launchers of nuclear weapons (maximum number 800 launchers, of which 700 deployed). The treaty also specified procedures for monitoring and verification as well as information exchange concerning the number of nuclear warheads and delivery vehicles and matters such as the exchange of missile launch notifications. It was also decided to continue the use of the BilateralConsultative Commission (BCC). The BCC was due to meet at least twice a year in Geneva.

Source: Pifer, 2015, p. 296.

46 Arms Control Association, 2022.

47 Pifer, 2015, pp.295–296.

Also partially paused due to the pandemic, the on-site inspections were due to continue in 2023, but Russia prohibited US on-site inspections in Russia and announced it would suspend its participation in New START. The United States, however, finds that a suspension is legally invalid under the treaty. At the same time, the Biden administration has emphasised that it is, regardless of this, ready to extend the treaty and to continue negotiations on replacing the treaty as well as related strategic dialogue if Russia resumes compliance with the treaty.[48]

The undermining of New START increases tensions between the leading nuclear powers, while at the same time feeding pressure for nuclear armament elsewhere. Although it, for the time being, appears that both states are complying with the limits set by the treaty for nuclear weapons systems, this is the first time since 1988 that the leading nuclear powers are in a situation where their relations are not governed by an intrusive verification regime with on-site inspections and information exchange practices.[49]

The problems faced by the START regime have not as such come as a surprise. Already before this, Russia had violated the INF Treaty by developing the new 9M729 missile (SSC-8), the range of which exceeded the range of 500 kilometres specified by the treaty. Accusations concerning this were made by President Barack Obama's administration in 2014. Correspondingly, Russia accused the United States of as many as three violations of the treaty. Succeeding the Obama administration, in October 2018, President Donald Trump issued an ultimatum to Moscow declaring that the United States would withdraw from the INF Treaty if Russia did not return to compliance with the treaty.[50]

In early 2019, the United States announced its intention to withdraw from the agreement following the period of notice of six months specified by the treaty. Trump's unilateralism and decision not to properly consult his European Allies aroused a great deal of criticism within NATO.[51] As of early August 2019, the INF Treaty, which had ushered in the eradication of the military political confrontations of the Cold War and the start of the golden era of nuclear arms control, no longer existed.[52]

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48 U.S. Department of State, 2023.

49 Without an effective and intrusive verification and control regime, it is particularly difficult to assess, for example, whether the other party is developing and further deploying multiple-warhead technology in its missiles.

50 Pifer, 2019.

51 Bange, 2021, pp.334–35.

52 Bugos, 2019.

This meant the arms control practices between the two biggest nuclear-weapon states inherited from the final stages of the Cold War are only barely alive. Tensions between the countries are higher than ever since the early 1980s. Regardless of this, there are still some functioning crisis management mechanisms in place between the United States and Russia. Senior officials at the White House and the Kremlin are reportedly maintaining contact to manage the risks of escalation related to the war in Ukraine.[53]

There are also reports of background communication channels between the administrations and armed forces of the countries.[54] Also the Ballistic Missile Launch Notification Agreement (BMLNA) signed in 1988, including its notification procedure, between the United States and Russia is still in force, as are the information exchange arrangements concerning strategic arms system exercises.[55]

These arrangements have traditionally been linked with separate discussions promoting nuclear weapon risk reduction and dialogue between the United States and Russia concerning strategic stability. In the latter context, the United States made a proposal in September 2023 to Russia for the continuation of arms control negotiations "without preconditions". In December 2023 Russia officially rejected the U.S. proposal. In its diplomatic note Russia linked progress in arms control negotiations with the general state of Russia-U.S. relations and the Ukraine War in particular. Thus, Russia detached itself from the long tradition of isolating arms control negotiations from general geopolitical tensions and other political issues between the U.S. and Russia.[56]

53 Salama and Gordon, 2022.

54 Hennigan, 2022.

55 The 1988 treaty was made legally binding in conjunction with the signing of New START. The United States has recently proposed the introduction of a similar procedure with China, too (see Mayer, 2023). China and Russia also have a similar notification agreement for ballistic missile launches signed in 2009 and extended by ten years in 2020. Acton, MacDonald and Vaddi (2021, pp.53–59) have proposed the development of notification agreements for ballistic missile launches and the expansion of their scope into a trilateral regime for the United States, Russia and China as a potential format for the multilateral development of arms control.

56 Bugos, 2023; Flatoff & Kimball, 2024.

The P5 group of nuclear-weapon states recognised under the NPT has also, even after the start of Russia's war of aggression, met at expert level, albeit with poor outcomes.[57] As late as early 2022, only weeks before Russia's invasion of Ukraine, the P5 states published a joint statement in which they affirmed that nuclear weapons should serve defensive purposes, deter aggression and prevent war. In their statement, they affirmed the Reagan-Gorbachev principle that a nuclear war cannot be won and must never be fought.[58] Postponed by two years due to the coronavirus pandemic, the autumn 2022 NPT Review Conference was generally a failure, as Russia opposed the negotiated outcome document.[59]

In general terms, headwinds are therefore being faced by the components anchoring the system of abstinence of the nuclear order – the nuclear non-proliferation system and the arms control treaties reducing the role of nuclear weapons in world politics. It should, however, be noted in the context of shifting political landscapes that certain arrangements, such as the Nuclear Suppliers Group (NSG), the practical implementation of nuclear material control, and the Missile Technology Control Regime (MTCR), are still in place regardless of increased tensions in world politics.

In addition to the erosion of nuclear arms control treaties, the key challenges of the international nuclear order can be summarised under three interrelated phenomena or trends. Firstly, the transformation of the nuclear order is characterised by a continued increase in multipolarity, especially between China, the United States and Russia. At the same time, the significance of nuclear policy has increased also at the regional level, particularly in the Middle East and East Asia. The multipolarisation and regionalisation of the nuclear arms race leads to a situation where the arms control architecture and related practices, attuned to the bipolar system and strongly bilateral relations of the Cold War era, no longer responds to the challenges posed by the new era.

57 Hernández, 2023.

58 The White House, 2022. Alongside their Strategic Arms Limitation Talks (SALT), the United States and the Soviet Union signed already in June 1973 the Agreement Between the United States of America and the Union of Soviet Socialist Republics on the Prevention of Nuclear War.

59 Russia did not accept the concern expressed in the draft outcome document about the safety of Ukrainian nuclear power plants or the strongly condemning references to the use of nuclear power plants as instruments of war (United Nations, 2022).

The second key trend arises from the questioning of the legitimacy of the NPT and the continued fragmentation of the field of nuclear disarmament policy. By the time of writing this, already 70 states have become parties to the Treaty on the Prohibition of Nuclear Weapons (TPNW) signed in 2017 at the United Nations and in force since 2021, with the majority of the world's states expected to follow suit in the near future.[60]

Although the TPNW was originally intended to supplement the NPT, criticism towards the NPT, which is associated with the interests of the recognised nuclear-weapon states, can be expected to increase in the near future. Declarations of Meetings of States Parties to the TPNW have in rather strong terms condemned any reliance on nuclear deterrence, including arrangements referring to extended nuclear deterrence and nuclear sharing arrangements based on alliances.[61]

It is therefore to be expected that the distance between states and civil society organisations grouped around the TPNW and, on the other hand, the group of states supporting the integrity of the NPT and gradual nuclear disarmament will increase.[62] At the same time, more and more non-nuclear-weapon states perceiving a threat from nuclear-weapon states, such as Finland, Sweden and South Korea, have sought protection from extended nuclear deterrence. With the distance between the group of states emphasising a total ban on nuclear weapons and the group stressing the indivisibility of the pillars of the NPT increasing, the number as well as room for manoeuvre of the bridge-builders between these two is also decreasing. At the same time, the breathing space of various middle-of-the-road nuclear disarmament initiatives is shrinking.

60 Around 60 per cent of UN member states are already located in areas declared as nuclear-weapon-free zones (NWFZ), which geographically cover the entire inhabited continental area of the Southern Hemisphere (see Mendenhall, 2020). There are a total of nine NWFSs, of which three are uninhabited areas or global commons (Antarctica, outer space and the international seabed). The NWFSs agreed between groups of states for inhabited areas are located in Latin America, the South Pacific, Southeast Asia, Africa and Central Asia.

61 The declaration of the second Meeting of States Parties to the TPNW is available at https://docs-library.unoda.org/Treaty_on_the_Prohibition_of_Nuclear_Weapons_-SecondMeeting_of_States_Parties_(2023)/TPNW.MSP_.2023.CRP_.4.Rev_.1_revised_draft_dec.pdf.
See in particular paragraphs 16–20 of the declaration.

62 See Ritchie, 2022.

The third key trend is the increased role of technological advances and the related dual-capability problem (that same technology can be used for weapons systems as well for peaceful purposes). Even though, as a rule, almost all technology may involve dual-capability issues, the problem of distinction is particularly challenging with regard to many modern technologies, such as cyber technologies, drones, space technology and artificial intelligence (AI) technology. Reaching verifiable arms control treaties concerning these technologies is markedly challenging.[63]

Correspondingly, technological breakthroughs relating to nuclear weapons systems have been reflected in developments including investments in intelligence technologies, improved accuracy of multiple-warhead missile delivery systems and the possibility to select lower-yield warheads.[64] Somewhat paradoxically, the development of nuclear weapons systems has long been characterised by stepping up flexible options for potential use to disincentivise anyone from actually using nuclear weapons in a crisis situation.

While the "second nuclear age" after the Cold War was characterised by the emergence of new regional nuclear powers, the "third nuclear age" in turn is characterised by nuclear weapons losing their monopoly as a weapons system that can be used for wide-ranging and even existential destructive effects. The classic division between conventional classes of weapons and those capable of mass destruction is in this respect becoming blurred, especially owing to the development of AI technologies and quantum computing. This may also provide incentives for further nuclear armament.[65]

63 See Vaunman & Volpe, 2023.

64 Lieber and Press, 2017.

65 Futter & Zala, 2021.

3 Fundaments of NATO's nuclear deterrence

3.1 Deterrence and nuclear deterrence

Western theoretical debate has produced several definitions for 'deterrence'. According to a narrow definition, 'deterrence' means preventing from action by fear of consequences.[66] A broader definition provided by the historian of nuclear strategy Lawrence Freedman proposes that 'deterrence' is "concerned with deliberate attempts to manipulate the behaviour of others through conditional threats".[67] At the same time, threats unavoidably involve a contradiction: It is the aim of a threat for the target to yield and for there to be no need to carry out the threat. At the same time, a threat can only work if the target really believes in the readiness to carry out the threat.[68] Therefore, capability, credibility, and communication have been regarded as the essential components for effective deterrence: Deterrence can only work if the state has genuine capability to carry out its threat. In addition, it must have the actual will to use that capability. Finally, it must be capable of communicating its intentions to its target so that the target is informed of the two first requirements being met.[69] Thomas Schelling, probably the most influential developer of deterrence theory, noted that there is an essential difference between warfare and deterrence: warfare is concerned with the skilful application of force, while deterrence is concerned with the skilful non-use of force. Deterrence is about "using potential military capability to pursue a nation's objectives." [70]

Sir Michael Quinlan, who was one of the most significant contemporary theorists of deterrence and a practitioner of deterrence during his long career at the UK Ministry of Defence, wrote that deterrence "arises from basic and permanent facts about human behaviour". People seek to take account of the consequences of their actions and seek to avoid adverse outcomes. People also exploit these universal realities when trying to influence decisions made by others. Quinlan concludes:

66 Schelling 2020, p.71.

67 Freedman 2004, p.6.

68 Schelling, 2020.

69 See e.g. UK Ministry of Defence, 2013. See also George & Smoke, 1976, p.64.

70 Schelling, 1980, p.9.

"Only the truly insane have no sense of weighing consequences."[71] Freedman in turn has described how natural selection has often favoured species that have succeeded in convincing their predators that they would fight back or would be too poisonous to eat if caught as prey.[72] Deterrence can therefore be something we do every day and occurs in relationships between people, states and species. If a state is able to influence the decisions of another state or actor, deterrence can be employed.

Freedman has argued that all deterrence is in a way self-deterrence, as deterrence always depends on the calculations made by the deterred. [73] This is why deterrence may also fail to work. The same threats do not work on everyone, and some are prepared to take bigger risks than others. Deterrence is therefore unavoidably about information influencing and psychological warfare. The adversary is issued with the threat of the intolerable consequences of its action and provided with a way out in not acting or in ceasing to act.[74]

In nuclear deterrence, the psychological problem is significantly greater than in deterrence based on other tools.

One of the original developers of nuclear deterrence strategy, Bernard Brodie suggested in the early years of the Cold War that, even though states had also previously sought to reach their aims by threatening other states with war, nuclear weapons permanently changed the logic of deterrence. Before the age of nuclear weapons, failure of deterrence could also be useful because it strengthened the effectiveness of the state's subsequent threats, as going to war demonstrated their credibility. In the Cold War circumstances of mutual nuclear deterrence, the aim, instead, was always the non-use of nuclear weapons.[75] The effectiveness of nuclear deterrence also requires, however, that the threat to retaliate the aggression is credible. This calls for demonstrated capability and readiness to use nuclear weapons.[76]

71 Quinlan, 2004, pp.12–14.

72 Freedman 2004, p.6.

73 Freedman, 2004, p. 30.

74 Schelling, 2020, p. 35; U.S. Department of Defense, 2006, pp.16–17; U.S. Strategic Command, 1995.

75 Brodie, 1959, pp.271–72.

76 Schelling, 2020; Tertrais, 2021, pp.4–5.

A party relying on nuclear deterrence must therefore make its threats credible so that it will never need to carry them out. In practice, a nuclear-weapon state or alliance must have maximum escalatory range in the conventional realm. This is because the stakes in the conflict may be highly important, but perhaps not important enough for anyone to credibly contemplate the use of nuclear weapons.[77]

If, however, deterrence is unilateral, that is, there is no threat of retaliation against the nuclear-weapon state, the nuclear-weapon state can act aggressively. This conclusion was already presented in the first comprehensive analysis of the significance of nuclear weapons edited by Brodie in 1946.[78] Likewise, if one nuclear-weapon state is able to credibly demonstrate its capability and readiness to either use nuclear weapons or to withstand a nuclear war longer than another nuclear-weapon state, it may be able to gain the upper hand in the deterrence battlefield. As a result, it may succeed in reaching its aim without war or, while war is ongoing, without using nuclear weapons.[79]

For these reasons, NATO has stated that it will remain a nuclear alliance as long as nuclear weapons exist in the world. It is for this purpose that NATO and its nuclear powers, with the United States the most important of these, maintain flexible nuclear capabilities, regularly conduct nuclear exercises (see section 3.8) and communicate their intentions to potential aggressors. At the same time, both the United States and NATO have, at least from the late 1950s onwards, sought to avoid excessive dependence on nuclear weapons. Relying on nuclear deterrence in any other than extreme circumstances may result in reduced effectiveness of deterrence due to a credibility problem.

Most nuclear-weapon states have developed their nuclear weapons to guarantee their own safety, which makes it simpler for them to maintain credible deterrence. As Schelling points out, the readiness of the United States to defend itself with nuclear weapons is likely to be clear to everyone. The United States and the United Kingdom are, however, committed to defending other countries within NATO with nuclear weapons and therefore been prepared to subject themselves to great risk under the circumstances of mutual deterrence. Schelling underlines that "to persuade enemies or allies that one would fight abroad, under circumstances of

77 Biddle, 2020.

78 Brodie, 1946, pp.60–62.

79 Reid and McDermott, 2022, p.20; Schelling, 2020, pp.106–16. For the current situation, see Weaver, 2023.

great cost and risk, requires more than military capability. It requires projecting intentions. It requires having those intentions, even deliberately acquiring them, and communicating them persuasively to make other countries behave."[80]

3.2 From massive retaliation to flexible response: development of NATO's nuclear doctrine during the Cold War

NATO has been a nuclear alliance throughout its history. NATO's first Strategic Concept laid out in 1949 that the general objective of the Alliance is to create "a powerful deterrent to any nation or group of nations threatening the peace, independence and stability of the North Atlantic family of nations". The first military measure listed in furtherance of the objective was to "insure the ability to carry out strategic bombing \[...] with all types of weapons, without exception".[81] It was commonly understood that US nuclear weapons would have been used for the bombing. The first drafts of the Strategic Concept referred to the use of the atomic bomb, but Denmark expressed its concerns about an explicit statement on the use of nuclear weapons, and in the end the reference was omitted from the adopted Strategic Concept.[82]

At the beginning of the Cold War, NATO was highly dependent on nuclear deterrence, as the Soviet Union had superior conventional military capacity compared to the forces of European NATO allies. In 1954, NATO's Strategic Concept adopted the strategic doctrine of *massive retaliation* for the defence of the Alliance. The strategy was based on the assumption that a Soviet attack against the Alliance could succeed only if the Soviet Union initiated a war with nuclear strikes against NATO's nuclear forces. Consequently, in the event of the outset of a major war,

80 Schelling, 2020, p.36. The United States has, in addition, under various treaties undertaken to defend Australia, Japan and South Korea and indicates that the defence of some of its partners might in some conditions involve the use of nuclear weapons. The United States suspended its treaty-based obligations to New Zealand in 1986 after New Zealand had declared itself as a nuclear-free zone and banned US nuclear-powered submarines from visiting New Zealand ports.

81 NATO, 1949. Strategic bombing was based on a line of thought having gained ground in the 1920s and the 1930s, whereby the air forces and massive bombing of cities would play a decisive role for the outcome of a major war. See Brodie, 1959.

82 Pedlow, 1997, p.XIII.

NATO planned to strike immediately with nuclear weapons against both the armed forces and the war industry of the Soviet Union.[83] The concept of massive retaliation originated from the United States, which had already outlined it publicly, and had adopted it a year earlier as part of its national security policy.[84]

NATO's strategy, however, suffered from credibility issues, as basing defence on the threat of large-scale use of nuclear weapons was regarded as problematic in a situation where aggression could be local and limited. The key threat perception was related to a potential Soviet military incursion against West Berlin.

NATO developed multiple contingency plans for the scenarios relating to the defence of Berlin in 1957–1963. One of the options, described as demonstrative, would have employed five low-yield nuclear weapons against military targets. The aim would have been to make the Soviet Union back down by demonstrating that NATO was prepared to use nuclear weapons. The option was regarded as less risky than the other options involving the use of nuclear weapons, but at the same time its ability to achieve the political objective was seen as highly questionable.[85]

At the same time, the development of options more limited than massive retaliation was given impetus by the development of Soviet nuclear forces. In the late 1950s, the Soviet Union achieved the capability to use intercontinental bombers and ballistic missiles to strike against the United States, which could no longer assume to survive unharmed if it was to threaten the Soviet Union with large-scale retaliation when defending Europe.[86]

The US nuclear deterrence strategy has traditionally sought *damage limitation* for reasons related to both homeland defence and extended deterrence. If the United States suffered less damage when defending others with nuclear weapons, the risk associated with limited nuclear options would be lower for the United States, which would bolster the credibility of the deterrence they create. In addition, damage limitation capability strengthens the position of the United States in relation to weaker nuclear-weapon states.[87] Means of damage limitation include destroying adversary nuclear weapons prior to their launch (*counterforce* strikes), preventing launches by means of, for example, cyber attacks (*left-of-launch* capabilities) and employing integrated air and missile defence.

83 NATO, 1954.

84 U.S. Department of State, 1954; National Security Council, 1953.

85 Maloney, 2010; NATO, 1962.

86 Wohlstetter, 1958.

87 Glaser & Radzinsky, 2023.

The credibility of extended deterrence and the potential decoupling of US and European security were sources of concern and mistrust throughout the Cold War.[88] French President Charles de Gaulle voiced this concern when questioning whether the United States would be ready to trade New York for Paris.[89] Consequently, the credibility of the deterrence was bolstered by means of words, policies and actions during the Cold War.[90] The best-known example of this was the United States maintaining troops in West Berlin, even though these troops had no hope of successfully defending their positions. This, however, ensured that any war in Europe would also involve US soldiers and, therefore, also the United States.[91] Providing European Allies with assurance about the readiness of the United States to also defend them with nuclear weapons still remains a key component of the US policy of extended deterrence.[92] The stationing of NATO's enhanced Forward Presence (eFP) troops – now known as Forward Land Forces (FLF) – in the Baltic States and Poland after Russia's aggression against Ukraine in 2014 was based on the same logic.[93]

The adoption of extended deterrence also emanated from the United States and the United Kingdom wanting to discourage their Allies from developing their own nuclear weapons by convincing them of their readiness to defend their Allies by all means. In the 1960s, the problem was resolved by creating the nuclear sharing arrangements and the Nuclear Planning Group (NPG), which are still in place and which were used to achieve the commitment of the members of the Alliance to nuclear deterrence and, subsequently, to having no nuclear weapons under the NPT. Previously, France had decided to develop its independent nuclear deterrent and pulled out from NATO's integrated military command structure in 1966. In addition to not regarding the US extended deterrence as credible and wishing to ensure its own strategic autonomy, France objected to withdrawal from the concept of massive retaliation.[94]

88 Pesu and Sinkkonen, 2024.
89 Office of the Historian, 1961.
90 Biddle, 2020.
91 Schelling, 2020, p.47.
92 Yost, 2009.
93 See e.g. Noll, Bojang and Rietjens, 2020.
94 Tertrais, 2020, p.4, p.15.

To solve the credibility issue concerning deterrence, in 1967 NATO abandoned the massive retaliation strategy and adopted a *flexible response* strategy based more strongly on conventional forces, with NATO also adopting the doctrine of limited nuclear war. Flexible response was also of US origin, but it had been developed in NATO, too, in the late 1950s. The American strategy was presented to the Alliance by the US Secretary of Defense Robert McNamara in 1962.[95] The change of strategy involved a notable dispute between the United States and France. France was firmly against the flexible response strategy in NATO both publicly and privately in 1962–1965. Schwartz suggests that a strong position in favour of flexible response would have meant NATO Allies choosing the United States over France, for which they were not prepared. As a full member of the Alliance, France also had the power to prevent the decision to replace massive retaliation with flexible response. The adoption of the new strategy became effectively possible once France withdrew from NATO's integrated command structure.[96]

The flexible response strategy was based on the threat perception whereby Soviet aggression against NATO could entail large-scale or limited war or measures below the threshold of war. Deterrence therefore had to be credible against many levels of aggression. Consequently, NATO's deterrence concept was based on three elements:

1. A manifest determination to defend the entire Alliance area against all forms of aggression.

2. A recognisable capability to respond to all levels of aggression.

3. A flexibility which would prevent the aggressor from predicting with confidence NATO's response to aggression, and which would lead the aggressor to conclude than an unacceptable degree of risk would be involved regardless of the nature of the attack.

95 Schwartz, 1983, pp.134–44.

96 Schwartz 1983, pp.187–88.

Should NATO's deterrence have failed, the actual defence strategy of the Alliance would also have been based on three options:

1. Direct defence with conventional forces.

2. Deliberate escalation first by broadening or intensifying non-nuclear engagement and later by the use of demonstrative or selective nuclear strikes.

3. Large-scale nuclear war.[97]

In flexible response, the primary form of deterrence was not the use of nuclear weapons but the threat of escalation aiming for the Soviet Union to conclude in all stages of aggression that the degree of risk involved in an attack was too high compared with the aims it could achieve. Therefore, the premises of the flexible response strategy were not fundamentally based on military strategy, as was the case with the strategy of massive retaliation. Instead, they reflected a Clausewitzian understanding of war as a continuation of politics with other means.[98] Flexible response aimed for aggression against NATO never being a rational continuation of Soviet foreign policy.

According to NATO's 1968 Strategic Concept, escalation in this context did not seek to defeat the enemy but, instead, to weaken the enemy's will to continue the conflict – another Clausewitzian principle.[99] In addition, the strategy sought to raise the threshold for using nuclear weapons and put more emphasis on conventional defence. The strategy based on the threat of escalation was, however, considered to require the manifested capacity to retain the initiative to use nuclear weapons first. This was required for the credibility of the strategy in practice, as otherwise the threat to escalate the war would be groundless. It was also considered that the effects of a nuclear war would be so grave that NATO should use nuclear weapons only after political, economic, and conventional military actions had been tried and found insufficient.[100] Flexible response remained as the NATO doctrine until the end of the Cold War.[101]

97 NATO, 1967; NATO, 1968; NATO, 1969.

98 Clausewitz, 1873.

99 Clausewitz, 1873.

100 NATO, 1968; NATO, 1969.

101 Pedlow, 1997, p.XXV.

The end of the Cold War and the waning of the threat of a large-scale war resulted also in the reassessment of the role of NATO's nuclear deterrence. In the 1991 Strategic Concept, NATO justified the role of nuclear deterrence not from a perspective based on threat assessments but, instead, by Soviet capabilities. NATO estimated that, regardless of a non-adversarial and cooperative relationship, the Alliance had to take account of Soviet military capability, including its nuclear capabilities, if it was to maintain stability and security in Europe. The concept also gave a political rationale for the continued deployment of US nuclear weapons in Europe. The presence of US nuclear weapons in Europe "inseparably linked" the security of Europe to that of North America.[102]

The next Strategic Concept, approved in 1999, continued to endorse this political function of US forward-deployed nuclear weapons. To ensure its safety, NATO outlined it would maintain an appropriate mix of nuclear and conventional forces based in Europe, although at a minimum sufficient level. The Strategic Concept states that "taking into account the diversity of risks with which the Alliance could be faced, it must maintain \[...] credible deterrence". It did not, however, regard conventional forces as sufficient. Nuclear weapons were considered to make a unique contribution to preserving peace as, according to the concept, they rendered "the risks of aggression against the Alliance incalculable and unacceptable".[103]

Although NATO's most recent Strategic Concept from 2022 does not directly mention nuclear weapons as a means of imposing costs, the wording whereby NATO has the "capabilities and resolve to impose costs on an adversary" that would "outweigh the benefits" of aggression is a typical way of defining the mechanism by which nuclear deterrence functions. The adversary is assumed to calculate the costs and benefits arising from its action as well as the costs and benefits of non-action. A threat of nuclear retaliation seeks to increase the adversary's perception of the costs of any attack to a level that makes the aggressor abandon its intention to attack.[104]

102 NATO, 1991.

103 NATO, 1999.

104 See e.g. Joint Chiefs of Staff, 2020, p.I-3 and U.S. Department of Defense, 2006.

3.3 Under US leadership: nuclear deterrence policy of NATO and its nuclear powers

NATO determines the basis and purpose of its nuclear capability in its Strategic Concept and other key documents. During the Cold War, the Strategic Concepts were classified documents. It is only since 1991 that they have been public. The nature of the Strategic Concepts has, however, changed since the end of the Cold War. Whereas during the Cold War they were clearly military strategy documents, after the Cold War they have by nature been policy documents outlining NATO's threat perceptions, tasks and aims.

Although NATO has not adopted a no-first-use policy, the way the concept notes that "any employment of nuclear weapons against NATO would fundamentally alter the nature of a conflict" implies that NATO considers first use by an aggressor as a particular threat. The concept states in this context: "The circumstances in which NATO might have to use nuclear weapons are extremely remote."[105] At the same time, the ambiguous threat to impose costs that outweigh the benefits of aggression can be leveraged to its fullest extent only if NATO does not adopt the no-first-use policy. In addition, nuclear deterrence can, according to current policy, be used to deter the use of biological or chemical weapons or other strategic attacks.

These policy documents play a major role, as NATO's activities are based on a consensus. In NATO, the Strategic Concept and other policy documents result in concrete measures the preparation of which is at times slow. Elaine Bunn, who served as US Deputy Assistant Secretary of Defense in 2013–2017, has mentioned having spent nine months to get the Allies to accept the 2016 Warsaw Summit Communiqué paragraphs 51–54 on nuclear weapons.[106]

In its Strategic Concept, NATO states that the strategic nuclear weapons of the United States are the supreme guarantee of its security. Strategic nuclear weapons have traditionally referred to high-yield intercontinental-range nuclear weapons that are targeted at cities, the military-industrial capacity and military forces of the adversary, while nuclear weapons used on the battlefield have been referred to as tactical. Today, this distinction is often regarded as inappropriate, as the use of nuclear weapons classified as tactical has long been recognised to have strategic effects. This logic also reflected in the current US and NATO policy, according to

105 NATO, 2022a, p.7.

106 Bunn, 2023, p.222; NATO, 2016.

which the employment of nuclear weapons would fundamentally alter the nature of a conflict.[107] In addition, many strategic nuclear capabilities, such as cruise missiles launched from strategic bombers, can be used against certain types of battlefield military targets. The important role of the United States in guaranteeing NATO's nuclear deterrence is based, alongside the country's other military force, above all on the size and diversity of the US nuclear arsenal, and on its decision-making system independent of NATO's consensus decisions, rather than the yield and range of individual weapons systems. Without US nuclear weapons, NATO's nuclear capabilities would be vastly overpowered by Russia's.

In addition, the Strategic Concept credits the nuclear deterrents of the United Kingdom and France with a deterrent role of their own in contributing to the security of the Alliance, as NATO regards their separate decision-making centres as complicating the calculations of potential adversaries, which has traditionally been thought to reduce the likelihood of a decision to attack. It is, however, illustrative of the order of importance of the nuclear powers that NATO did not recognise the contribution of the nuclear forces of the United Kingdom and France to the deterrence of the Alliance until the Ottawa Declaration in 1974.[108] To conclude, the Strategic Concept states that NATO's nuclear deterrence posture relies "also" on the forward-deployed US nuclear weapons, deliverable by dual-capable aircraft provided by NATO allies that participate in the Alliance's nuclear sharing arrangements.[109]

In terms of organisation, the forward-deployed US nuclear weapons are under US custody, but would operate under the auspices of NATO, rather than the US Strategic Command (USSTRATCOM), which is the US national organization in charge of nuclear planning and operations. However, the forward-deployed nuclear capability is connected to the rest of the US nuclear deterrent, US strategic plans and US military forces used to implement them. The system is massive.

107 See e.g. Schelling, 2020; The U.S. Department of State 2024; NATO 2022, p.7; U.S. Department of Defense 2022, p. 7. However, some official documents continue to maintain the distinction between strategic and non-strategic nuclear weapons. See, e.g. Woolf 2022, pp. 8–11.

108 NATO, 1974.

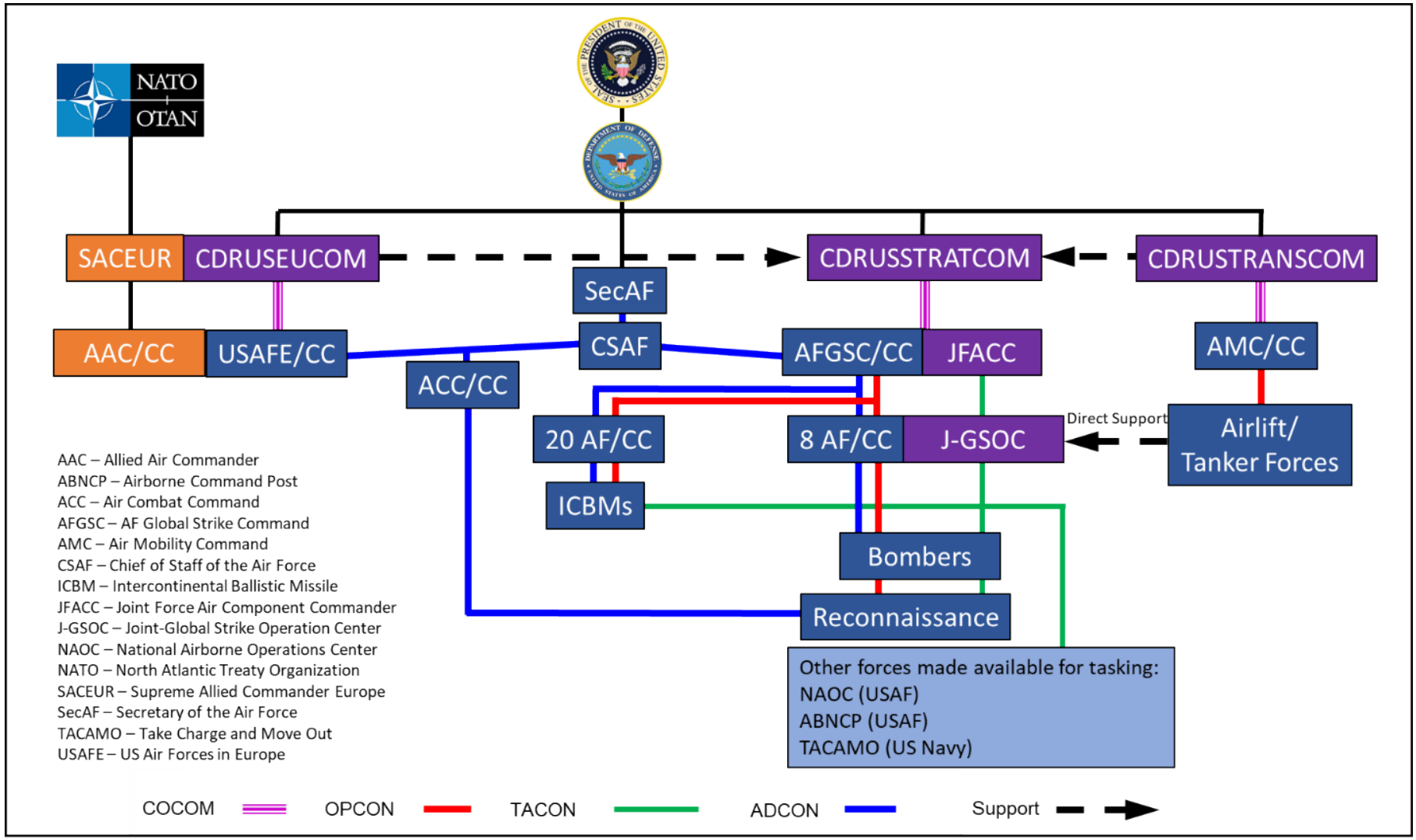
109 NATO 2022a, p.8.

Figure 2 shows how the nuclear weapons deployed in Europe by the United States are linked with the US Air Force Organization for nuclear operations. Command authority over nuclear weapons deployed in Europe by the United States is exercised by NATO's Supreme Allied Commander Europe (SACEUR), who is dual-hatted as Commander of US European Command (CDRUSEUCOM). Likewise, the Allied Air Commander (AAC) also serves as Commander of US Air Forces in Europe and Africa (USAFE/CC).

CRDUSEUCOM exercises combatant command (COCOM) of US Air Forces in Europe and Africa. The United States Strategic Command (USSTRATCOM) and CDRUSEUCOM have a supported/supporting command relationship with each other: USSTRATCOM is the supporting commander of CDRUSEUCOM for planning, while CDRUSEUCOM is the supporting commander for execution of US strategic war plans. The Commander of USSTRATCOM (CDRUSSTRATCOM) in turn has combatant command of US Air Force Strike Command (AFGSC/CC), which has operational command (OPCON) of the Twentieth (20 AF/CC) and Eighth Air Forces (8 AF/CC), that is, the intercontinental ballistic missiles (ICBMs) and strategic bombers of the United States. As regards the execution of nuclear strikes, however, CDRUSSTRATCOM does not have authority over nuclear weapons assigned to SACEUR/CDRUSEUCOM.[110]

110 U.S. Air Force, 2020a, p. 16. Command of the ballistic missile submarines (SSBNs) of the US Navy is not shown in the figure, as the figure presents the Air Force organisation of nuclear operations, but these nuclear weapons are also under the command of USSTRATCOM. The meanings of the command relationships are specified in detail in the U.S. Air Force Doctrine on Command and Control. Combatant command means command authority to exercise command over assigned forces, designating objectives and organising their activities that cannot be transferred or delegated elsewhere. This means the commander has full and permanent authority over and responsibility for the forces under them. See. U.S. Air Force, 2020b, pp.52–54.

Figure 2. United States Air Force organisation for nuclear operations (U.S. Air Force, 2020a, p.16)



The link between NATO and US nuclear deterrence is also demonstrated by the 1996 Nuclear Supplement to the Joint Strategic Capabilities Plan (JSCP) of the United States, according to which SACEUR had the opportunity to provide USSTRATCOM with information on NATO's Major Contingency Options, which USSTRATCOM could employ in its annual war game analyses to assess the effectiveness of the Single Integrated Operational Plan (SIOP), the US general plan for nuclear war.[111] Unlike during the Cold War, USSTRATCOM no longer has a SIOP. Instead, it has a variety alternative plans concerning different types of regional crises and wars tailored for different adversaries, with some of these including the use of nuclear weapons. The nuclear operational plans that the president is provided with can be executed immediately.[112]

For the most part of the Cold War, NATO's nuclear war plans were formulated at Supreme Headquarters Allied Powers Europe (SHAPE). Alongside other post-Cold War changes, in 1999 NATO decided to abandon standing nuclear war plans and to maintain adaptive planning capability. In practice, under the current policy, this means that SHAPE may plan certain aspects of what the nuclear planning might entail. According to a report on the nuclear employment strategy submitted to the Congress, the United States also maintains national adaptive planning capability "to support a flexible and tailored nuclear strategy and the ability to employ nuclear weapons in a conflict".[113] Although NATO embarked on the reassessment of nuclear deterrence following Russia's invasion of Ukraine in 2014, no policy concerning the readoption of the nuclear planning process or higher readiness levels has been made public. Elaine Bunn, however, finds that there are indications of these being discussed.[114]

Consequently, NATO's nuclear operations and planning, while involving allies, are ultimately led by the United States. Although decisions on the use of forward-deployed US nuclear weapons would involve consulting NATO's Nuclear Planning Group (NPG) (see section 4.1), the deterrent effect of these weapons is dependent on the entire US nuclear arsenal, as the use of a nuclear weapon is in itself a threat of continued use.[115] Deterrence is less effective if the aggressor is able to calculate that it will be capable of withstanding nuclear war longer than its adversary.

111 Joint Chiefs of Staff, 1996b, p.G-5.

112 Kehler, 2023, pp.146–47; Elliot, 2023, p.118.

113 U.S. Department of Defense, 2020, p.8.

114 Bunn, 2023, p.212.

115 See, Schelling, 2020.

The nuclear weapons of the United Kingdom have been assigned to the defence of NATO since 1962. According to Peter Watkins, this means in practice that the UK nuclear force is included within the collective deterrence agreed by the NPG and that it would be available for use by NATO under plans made by SACEUR, unless otherwise required by the "supreme national interests" of the United Kingdom.[116] The use of UK nuclear weapons requires in all circumstances, however, authorisation by the UK Prime Minister.[117] According to Watkins, the United Kingdom emphasises "that it is deliberately ambiguous about when, how, and at what scale it would employ those weapons". The purpose of this ambiguity is to complicate the calculations of adversaries and, consequently, enhance the effectiveness of deterrence.[118] The United Kingdom leases the intercontinental ballistic missiles from the US, and the countries cooperate in the development of nuclear warheads and submarines.

According to Ian Davis, during the Cold War the primary targets of UK nuclear weapons were Moscow and the Soviet command and control system in the Moscow region. During the Cold War, cooperation with the United States was very close, but the relationship loosened when, in 1994, the United Kingdom, alongside with the United States and Russia, de-targeted its nuclear weapons in peacetime. In NATO, where planning according to Davis was, however, a process dominated by the United States, cooperation effectively ended at operational level. This was simply because NATO no longer had a process for nuclear war planning. The previous system of close operational planning in NATO structures was replaced by an assumption based on political statements that the UK nuclear force would be made available to NATO if required.[119]

Davis considers it possible that targets for UK nuclear weapons could be assigned according to US strategic plans, with NATO's strategic targeting in that case being a predominantly Anglo-American arrangement.[120] The United Kingdom is the only NATO Ally with a Liaison Officer at USSTRATCOM headquarters in Omaha.

116 Watkins, 2023.

117 Simpson, 2013.

118 HM Government, 2021, p.77.

119 Davis, 2015, pp.16–18.

120 Ibid.

The close cooperation between the United States and the United Kingdom is also reflected in the current NATO policy whereby the use of forward-deployed US nuclear weapons assigned to NATO requires not only political approval by the NPG but also authorisation from the US President and UK Prime Minister.[121] The shared decision-making power is logical, as nuclear weapons available to SACEUR include both US and UK weapons. During the Cold War, SACEUR also had access to nuclear weapons launched from US submarines allocated under SIOP to fulfil the NATO nuclear mission.[122]

Unlike the United States and the United Kingdom, France has not committed its nuclear weapons through practical measures to NATO defence. The primary purpose of French nuclear weapons is to guarantee French sovereignty and protect its vital interests at any given time, the nature of which is assessed case-specifically by the President.[123] France did not join the NPG when it returned to the Alliance's command structure in 2009, and according to President Emmanuel Macron there is no change upcoming regarding this. According to Macron, French nuclear weapons and vital interests do, however, have a "European dimension", and he has invited partner countries to take part in exercises of French nuclear forces.[124] These exercises and planning are, however, national and therefore separate from NATO. Any adversaries of NATO need to, however, also take account of the French nuclear deterrent in their decision-making.

Ian Bond has estimated that NATO Allies have lower confidence in the French nuclear deterrent than in the US deterrent, as the French deterrent force is not integrated into NATO's defence. The United Kingdom's independent nuclear deterrent has also been regarded as in part uncertain in safeguarding security, as the United Kingdom has stationed only a small number of permanent troops in Europe. Confidence is highest in the US deterrent, as it is linked to the tens of thousands of permanent US forces stationed in Europe.[125]

121 NATO, 2022b.

122 Andreasen, Williams & Rose, 2018, p.18.

123 General Secretariat for Defence and National Security, 2022, p.20; p.22; p.33; Macron, 2020; Tertrais, 2020, pp.14–16.

124 Macron, 2020.

125 Bond, 2021.

3.4 Nuclear strategies of nuclear powers of the Alliance

NATO does not publish information on nuclear employment policy concerning forward-deployed US nuclear weapons. As these are US nuclear weapons, however, the basic principles governing their potential employment can be derived from the US nuclear doctrine and other documents outlining US nuclear policy. The administration publishes the Nuclear Posture Review (NPR), in addition to which the US President provides concise guidance concerning US nuclear strategy that, following more detailed guidance by the Secretary of Defense, ends up with the armed forces for operational planning.[126] The presidential guidance is classified, but the Congress is provided with a report on the main features of the guidance if the guidance results in a change in US nuclear strategy.

Each US administration usually outlines some changes to its nuclear policy, while at the same time the broad lines of US nuclear strategy are firmly established. US nuclear strategy is based on case-specific determination of damage inflicted upon the aggressor, which therefore allows both limited and large-scale use of nuclear weapons. The United States assumes that the likeliest scenario for adversary employment of nuclear weapons is a limited nuclear strike in the context of a conventional conflict. Should the use of nuclear weapons be required, the US NPR defines the roles of nuclear weapons as achieving US objectives and, following this, ending use and restoring deterrence. Efforts will be made to end any conflict at the lowest possible level of damage and on the best achievable terms for the United States and its Allies and partners.[127]

The UK nuclear weapons strategy is not regarded as being significantly different from the US approach. UK nuclear weapons are assigned to NATO's defence, which is why the strategy would in most circumstances be implemented as part of broader NATO and US strategy. The United Kingdom does, however, only have submarine-launched intercontinental ballistic missiles (SLBMs), which is why the role of its nuclear weapons would be narrower in NATO's defence than US nuclear weapons.

126 Elliot 2023, pp.109–10; U.S. Government Accountability Office, 2012, p. 5. For a declassified Cold War era presidential nuclear weapons employment policy, see The White House 1981.

127 U.S. Department of State, 2022, p.8.

Consequently, any use of nuclear weapons aims at the same time to demonstrate US resolve and to deter escalation.[128] In these circumstances, the use of nuclear weapons may be stronger than first use by the adversary. According to the report to the Congress, the 2019 presidential guidance concerning US nuclear strategy was based on the assessment that commitment to the same level of response would make it easier for the adversary to assess the consequences of its use of nuclear weapons, which might lower its threshold for nuclear first use.[129] At the same time, the threat of an escalating nuclear war serves as deterrent against the first use of nuclear weapons.

According to the United States, the Law of Armed Conflict applies to the use of nuclear weapons too, and US policy is to not purposely target civilian populations. Former Commander of USSTRATCOM Robert Kehler has remarked that legal issues were one of the four issues requiring most of his attention while Commander. Legal advisers are constantly present in planning and decision-making processes. The other three issues related to civil-military relations, planning assumptions, and integration with other combatant commands.[130]

This means the United States targets its nuclear weapons at lawful military targets, and the aim of their use would be to achieve broader military objectives. US nuclear strategy is, therefore, based on having multiple yield options and a nuclear arsenal that includes variable- and low-yield nuclear weapons so that the use of nuclear weapons can be calibrated in accordance with the needs of the operation, and the collateral damage caused by nuclear strikes can be controlled.[131]

Nuclear weapons effects are largely based on the blast wave and thermal radiation released by the explosion. In addition, lethal initial radiation is produced for the duration of the explosion. Wide-spreading and soil-contaminating fallout spreads mainly in the form of small particular matter lifted from the ground by the blast (residual radiation). These effects can be controlled not only by adjusting the

128 Joint Chiefs of Staff, 2019, pp.1–2.

129 U.S. Department of Defense, 2020, p.8.

130 Kehler, 2023, pp.146–47

131 Joint Chiefs of Staff, 2019, p.III-3; Joint Chiefs of Staff, 2020, p.III-4. The yield of variable-yield nuclear weapons can be selected prior to use. The lowest yield options of some nuclear weapons create destructive effects comparable to those resulting from massed use of conventional weapons. Low yield is, however, in part a misleading concept, as many alternatives specified as low in yield cause immense destruction. The highest-yield nuclear weapons are likely to be reserved for extremely hardened targets such as underground facilities or for the destruction of ground-mobile ICBMs.

yield but also by controlling the height of burst (HOB). In normal conditions, the production of fallout can be avoided by detonating a nuclear weapon in the air at a HOB specified on the basis of the yield.[132] Air burst would be used in almost all cases against battlefield targets (classified as soft), in order to maximise the effects of the blast wave and thermal radiation, and would in normal conditions produce no fallout. However, even when detonated in this way, a nuclear weapon will still produce initial radiation.[133]

The destruction of hardened targets such as nuclear silos has traditionally required ground bursts that produce fallout. According to Lieber and Press, technological advances have resulted in such improvements in the precision of nuclear weapons that it may be possible to destroy some hardened targets with air bursts at altitudes above the fallout threshold.[134] In practice, however, silo-based ICBMs are probably currently planned to be destroyed with ground bursts.

The US 1996 Doctrine for Joint Theater Nuclear Operations, which provided guidance for employment of non-strategic nuclear weapons, including the American B61 bombs deployed in Europe, states that nuclear weapons might be used to strike the following targets:

1. Weapons of mass destruction, as well as associated command and control, production, and logistical support units.

2. Ground combat units and their associated command and control and support units.

3. Air defence facilities and support installations.

4. Naval installations, combat vessels, associated support facilities and command and control capabilities.

5. Non-state actors (facilities and operation centres) that possess weapons of mass destruction.

6. Underground facilities.[135]

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132 Glasstone, 1962, pp.28–47.

133 In rainy or snowy conditions, however, air burst may also cause fallout.

134 Lieber and Press, 2017, pp.27–31.

135 Joint Chiefs of Staff, 1996a; Joint Chiefs of Staff, 2019, p.III-3.
Non-state actors equipped with weapons of mass destruction are unlikely to be relevant in scenarios relating to the defence of Europe.

The subsequent US nuclear doctrines do not specify the targets in greater detail. The 2019 Joint Doctrine for Nuclear Operations does, however, state in the section on planning and targeting of regional scenarios what adaptive planning means for Commanders planning the use of nuclear weapons: "the capability to rapidly identify and strike previously unidentified and newly emerging targets". In practice, such targets could be some of the targets mentioned in the table above. However, the 1996 doctrine discusses these targets in the context of broader theatre operations, which means that B61 bombs might be intended only for some of these targets, while other nuclear systems might be used to target others. Nonetheless, capability for adaptive planning maintained by NATO is likely to apply specifically to potential use against theatre military targets. Many of these targets do not exist in peacetime, which is why the abandoning of standing nuclear war plans does not in this respect play a decisive role regarding the credibility of NATO's deterrence concerning forward-deployed nuclear weapons. Instead, deterrence issues concern, above all, other factors, such as the readiness levels, exercises, ensuring survivability of weapons, and the decision-making process. Finally, it is also unclear what types of plans have been produced by NATO's adaptive planning *capability* and whether NATO's increased emphasis on nuclear deterrence has resulted changes in this area.

The US strategy is based on the assumption that the fear of nuclear war escalation caused by the use of nuclear weapons would make the adversary abandon its aggression or make the adversary cease its employment of nuclear weapons. At this stage, the deterrence against escalation of the war would be the threat of continued use of nuclear weapons and, ultimately, strategic nuclear weapons. Contrary to common belief, the US strategy concerning strategic nuclear weapons does not seek the destruction of civilian populations. This principle is regularly confirmed in documents outlining US nuclear policy and strategy.[136] Then US Secretary of Defense Caspar Weinberger publicly confirmed this principle in 1986. According to Weinberger, a strategy based on threatening a civilian population would be neither moral nor rational. According to him, deterrence was based on capability to threaten what is valuable to the military-political leadership of the adversary. In the case of the Soviet Union, it was the state leadership itself, the military power of the state, its capability to rule its country, and its industrial capacity to wage war.[137] The now-declassified US Nuclear Employment Policy from 1981 confirms this broad overview of targets.[138] According to former Commander of USSTRATCOM Richard Mies, these targeting principles still remain the same: Mies

136 U.S. Department of Defense, 2020, p.8.

137 Weinberger, 1986, pp.681–2.

138 The White House, 1981.

writes that strategic nuclear weapons have traditionally been targeted at "military forces, war-supporting industry, command and control capabilities, and military and national civilian leadership". Even at this stage, the aim would be to use "the minimum level of force intended to achieve our objectives".[139]

There are yield alternatives for nuclear warheads of strategic nuclear weapons, too, and higher precision provided by more advanced guidance systems of re-entry vehicles enables the destruction of some targets with increasingly lower-yield nuclear weapons. For example, the W93 warhead intended for US Trident D5 SLBM, currently under development by the United States is described to improve "flexibility to address future threats", which in this context usually refers to the possibility to adjust the yield to match the requirements of the mission.[140]

The latest Report on the Nuclear Employment Strategy of the United States to the Congress states that the US strategy is not based a launch-on-warning posture, that is, launching retaliatory strikes based on early warning (provided by satellites or ground-based radars). To bolster deterrence, the United States maintains launch-under-attack capability, but does not rely on this strategy. "Rather, US nuclear forces are postured to withstand an initial attack and provide maximum decision-making time for a President".[141] This also applies to the silo-based Minuteman III missiles. Elliot notes that, contrary to common belief, the availability of immediately executable options does not mean that the US nuclear forces are in a hair-trigger posture that could lead to disastrous miscalculation in crisis situations. Minuteman ICBMs are, however, on permanent alert status and are included in some of the response options the President is provided with.[142] The 1981 US Nuclear Employment Policy similarly outlined that the US must maintain, but not rely on, launch-under-warning capability to complicate Soviet planning. It additionally noted that the US "must be prepared to launch our recallable bomber forces upon warning that a Soviet nuclear attack has been initiated."[143]

In normal conditions, both SLBMs and ICBMs have no targets or are set to open-ocean targets, which limits the risks involved in accidental launches. This is based on the 1994 US–Russia mutual detargeting agreement. Practical compliance cannot be verified, but nuclear-weapon states do not have any major strategic reasons to abandon it as, in a crisis situation, missiles can be retargeted within no more than minutes.

139 Mies, 2012.

140 U.S. Department of Energy, 2020, pp.2–10.

141 U.S. Department of Defense, 2020, p.8.

142 Elliot, 2023, p.118.

143 The White House, 1981, p. 3.

The United States is integrating nuclear deterrence more strongly into other deterrence and defence by synchronising practical planning, exercises and military operations relating to nuclear and non-nuclear capabilities. According to the United States, it is not changing the role of nuclear weapons in military operations. Instead, the integration aims to raise the nuclear threshold of adversaries by undermining adversary confidence in strategies based on the threat of limited use of nuclear weapons. The United States specifically refers to China and Russia as adversaries whose limited nuclear employment or coercive strategies facilitated by diverse nuclear capabilities it must be able to deter. Although China has kept its no-first-use pledge, its nuclear programme, its strengthening conventional forces and the escalation management concepts that appear to refer to the limited use of nuclear weapons developed by its military forces have been causes for concern for the United States and its Allies. According to the United States, ability to deter limited use of nuclear weapons therefore plays a key role when maintaining deterrence against conventional aggression. Russia's nuclear coercion as part of the war in Ukraine is likely to bolster this trend. At the same time, in its own strategy, the United States wants to maintain "a very high bar" for nuclear employment.[144]

In this context, the significance of NATO's joint nuclear planning and exercises is also increasing. The United States assesses that an adversary may be more likely to "choose restraint if it believes that it is challenging not only the United States but a unified alliance or coalition prepared to share risks, confront aggression, and impose prohibitive costs".[145] In this respect, the political and strategic significance of the US nuclear weapons deployed in Europe in wartime is greater than the size of the arsenal, as the deterrent effect of the use of these weapons would also be based on a signal of NATO's cohesion and readiness to continue the war to restore the deterrence.

At the same time, advanced conventional weapons systems, such as hypersonic weapons systems developed by the United States, provide the option of threatening some potential targets of nuclear weapons with conventional weapons.[146] Consequently, nuclear deterrence is more strongly linked to other defence capability.

144 U.S. Department of Defense, 2022, pp.3–4. For concepts relating to use of nuclear weapons by Chinese military forces, see China Aerospace Studies Institute, 2022; Tellis, 2022, pp.36–38.

145 U.S. Department of Defense, 2022, p.1; pp.8–10.

146 U.S. Congressional Budget Office, 2023. 'Hypersonic weapons' usually mean weapons that fly faster than five times the speed of sound at some point during their flight. The term is somewhat misleading as, according to this definition, also ballistic missiles are hypersonic.

Since the application of the nuclear deterrence of France is based on the French President's assessment of the country's vital interests and the threats to them, the country's nuclear deterrence adapts to the circumstances. France maintains deliberate ambiguity regarding the potential circumstances of nuclear employment. According to President Macron, "France will never engage into a nuclear battle or any forms of graduated response". Instead, France reserves its nuclear forces for retaliation the purpose of which is to inflict "absolutely unacceptable damage" to the aggressor's "political, economic and military nerve centres".[147] Regardless of this, retaliation may also be limited, as the French assessment of what is unacceptable damage may vary depending on the adversary. Nuclear deterrence may also be applied to states in situations where they have used terrorist groups against France. A special feature of the French nuclear doctrine is the option of using nuclear weapons for a "final warning", the purpose of which is to signal that France regards that its vital interests are at stake, and to restore deterrence. The final warning could take the form of a limited nuclear strike or, for example, the detonation of a nuclear weapon at high altitude creating an electromagnetic pulse that would not necessarily result in direct casualties but the purpose of which would be to restore deterrence by convincing the aggressor of France's readiness to retaliate. The other special feature is that France draws a decisive line between nuclear deterrence and conventional military capability. France links the concept of deterrence exclusively to nuclear weapons.[148]

3.5 Arsenals of NATO's nuclear-weapon states

NATO does not have nuclear weapons of its own. Instead, its nuclear capability is based on the nuclear weapons of NATO's nuclear-weapon states, with the majority of these held by the United States. US nuclear capability is based on a three-legged force structure known as the nuclear triad, comprising land-based, sea-launched, and air-delivered nuclear weapons. Russia's nuclear forces are also based on the nuclear triad. China is building corresponding capability, but the air leg of its triad is still comparably weak. United Kingdom only has sea-launched nuclear weapons, and the French arsenal features sea- as well as air-launched nuclear weapons.

Each leg of the triad has its unique features. Land-based missiles provide capability for prompt response while under attack, and submarines provide capability for assured and mobile response. Bombers also provide mobile and flexible capability.

147 Macron, 2020, Tertrais, 2020, pp.14–16; Pannier and Schmitt, 2021, pp.59–61.

148 Macron, 2020; Tertrais, 2020, pp.35–36.

They can also be recalled, which reduces the risks related to miscalculation.[149] As bombers are a capability that is easy to detect and highly mobile, nuclear powers use them also to signal the credibility of their deterrence and their capabilities.

The United States is estimated to maintain an arsenal of approximately 3,708 nuclear warheads, of which around 1,770 are operationally deployed and 1,938 are held in reserve. Additionally, around 1,536 nuclear warheads are retired and awaiting dismantlement. Of the around 1,770 warheads that are deployed, 400 are on ICBMs, around 970 on SLBMs and 300 at bomber bases in the United States. Kristensen and Korda estimate that forward-deployed US nuclear weapons in Europe comprise around 100 nuclear bombs.[150] The precise number of forward-deployed nuclear weapons has not been confirmed, but the arsenal may also be larger than this. A draft of a 2019 report to the NATO Parliamentary Assembly mentioned that there were around 150 nuclear weapons deployed in Europe. The mention of the number of nuclear weapons was omitted from the final report.[151] Then Nuclear Policy Director at NATO Jessica Cox wrote in 2020 that, "according to open source information", the United States has deployed around 150–200 nuclear weapons in Europe.[152] The forward-deployed US nuclear weapons in Europe are B61 nuclear bombs (see section 3.6.2), which are in custody of the United States but which, under NATO's nuclear sharing arrangements would, following a decision by the NPG and authorisation by the United States and the United Kingdom be released for operation by Belgium, the Netherlands, Germany, Italy and possibly Turkey.

US nuclear arsenal is postured to withstand an initial attack against US nuclear forces.[153] Consequently, the United States currently equips its silo-deployed Minuteman III ICBMs, which are most vulnerable to initial attack, with a single nuclear warhead, which means the aggressor would not benefit from destroying the silos as this would, with a high degree of probability, require expending two nuclear warheads. Instead, the majority of operationally available US nuclear weapons are deployed on submarines, where they are under best protection.

149 Mies, 2012, p.15.

150 Kristensen & Korda, 2023.

151 De Boeck, 2019.

152 Cox, 2020.

153 U.S. Department of Defense, 2022, p.12.

Until 2026, US capabilities will be limited by the New START treaty, which allows it to have 1,550 deployed strategic (defined as having a range of over 5,500 kilometres) nuclear warheads and 800 launchers, of which 700 can be deployed.[154] If, as appears likely, the treaty will not be replaced, the United States may, if it so wishes, increase the size of its operationally available arsenal by converting B-52 bombers to a nuclear role, reactivating deactivated ballistic launch tubes on ballistic missile submarines (SSBNs), and uploading its Minuteman III missiles with two or three nuclear warheads instead of the current single one.

The United Kingdom is estimated to have four SSBNs and 48 SLBMs. The estimated size of the UK nuclear arsenal is around 225 nuclear warheads, with the latest estimates being that around 120 are currently operational. In 2021, the United Kingdom decided to increase the arsenal to up to 260 nuclear warheads and, at the same time, announced that, to maintain ambiguity, the United Kingdom will no longer publish figures on its operational stockpile of nuclear weapons.[155]

French nuclear deterrent is based on SLBMs and air-launched cruise missiles (ALCMs) carried by dual-capable aircraft. The arsenal is estimated to consist of approximately 290 nuclear warheads, of which 240 are reserved for SLBMs and 50 for ALCMs. All weapons are deployed or operationally available, except for around 10 warheads that are spares or in maintenance.[156] France is the only NATO nuclear-weapon state that has deployed nuclear-tipped cruise missiles in Europe.

The significance of the United States to NATO's nuclear deterrence is further accentuated by the maintenance work required by SSBNs, which is why the UK and France each can usually have only one SSBN on patrol at any given time. In an ideal situation, two others can be sent to patrol routes. Of the 14 US SSBNs, around five are on hard alert, in addition to which four or five can be brought to alert status within hours or days.[157]

154 The treaty defines as 'launchers' ICBMs, SLBMs and heavy bombers. Since the treaty counts a strategic bomber as one launcher and one nuclear warhead, in reality there are more nuclear warheads than nominally permitted by the treaty.

155 Kristensen & Korda, 2021.

156 Kristensen & Korda, 2023.

157 Kristensen & Korda, 2023.

The majority of NATO's variable- and low-yield nuclear weapons are also US weapons. These include the nuclear bombs and cruise missiles of the intercontinental B-52H Stratofortress and B-2 Spirit bombers, around 25 low-yield warheads loaded on SLBMs and the forward-deployed nuclear weapons deployed in Europe. In addition, in the 2020s and 2030s, the United States will upgrade its intercontinental bombers to B-21 Raider stealth bombers, of which it is currently planning to procure at least 100. The development of the new bomber is part of the nuclear modernisation programme launched during President Obama's administration and due to continue until the end of the 2040s. Unlike the B-2, the B-21 Raider will be able to carry also ALCM with a variable-yield warhead, the Long-Range Standoff Weapon (LRSO), currently under development. According to the United States, these flexible capabilities play a key role in the deterrence strategy tailored for Russia.[158]

Table 1. Estimated composition of NATO's nuclear capability in 2023

	Submarine-launched nuclear weapons	Air-delivered bombs and missiles	Nuclear warheads for ICBMs	Stockpiled warheads
United States	970/14/280	300	400	1 938
United Kingdom	120/4/48	0	0	140
France	240/4/48	50	0	0
Nuclear-sharing arrangements (The US)	0	100–200	0	0

The table shows the number of operationally available nuclear warheads. For submarine-launched nuclear weapons, the number of warheads, SSBNs and SLBMs is given, respectively.

Russia has a nuclear arsenal of roughly the same size as the United States. A special feature of Russian nuclear capabilities is, however, the strong focus on short- and intermediate-range nuclear weapons, the Russian inventory for which is estimated to be around 2,000 nuclear warheads. Russia has these non-strategic nuclear weapons on delivery vehicles operating on land, at sea and in the air. The

158 U.S. Department of Defense, 2022, p.11.

arsenal includes, for example, ballistic missiles, cruise missiles, nuclear bombs, torpedoes and depth charges.[159] Russia has around ten times more non-strategic nuclear weapons than the United States, in addition to which its arsenal is more diverse. Although all Russian non-strategic nuclear weapons are in storage, most of the storage sites are in the European part of Russia and, following an order, the nuclear warheads can be transferred rapidly to launch platforms. President of Russia Vladimir Putin has said he regards having more non-strategic nuclear weapons as a competitive advantage of Russia over NATO.[160]

In addition, with China having embarked on a major build-up, in the 2030s the United States will face for the first time a second nuclear peer, which has resulted in debate about strengthening US nuclear deterrence by bolstering capabilities and possibly by acquiring new weapons systems.[161] The US Congress appointed a bipartisan Congressional Commission to conduct of review of the strategic posture of the United States, and the Commission completed its work in 2023. The previous, and first, Congressional Commission on the Strategic Posture of the United States (SPC) was appointed in 2009, and its work resulted in the nuclear modernisation programme launched by the Obama administration. The SPC is regarded as influential, but its recommendations are not, however, binding on the administration and, so far, the present US administration has maintained its position that the new situation does not require the growth of the US nuclear forces.

NATO's nuclear planning and the US nuclear weapons deployed in Europe only play a minor role in the SPC report. The SPC does, however, find that strengthening the credibility of deterrence simultaneously against China and Russia requires additional regional nuclear capabilities in both Europe and the Asia-Pacific regions.[162] It is commonly understood that this would mean the development of a nuclear-tipped submarine-launched cruise missile.

159 Kristensen, Korda & Reynolds, 2023.

160 President of Russia, 2023.

161 See e.g. Lawrence Livemore Laboratory, 2023.

162 U.S. House Committee on Armed Services 2023, p.49.

3.6 NATO's nuclear sharing arrangements

3.6.1 Nuclear sharing arrangements during and after the Cold War

Nuclear sharing has been central to NATO's nuclear deterrence policy since the late 1950s. At a more general level, 'nuclear sharing' refers to an arrangement where a non-nuclear-weapon state is allowed to operate a launch platform that can be used to deploy or use a nuclear weapon of a nuclear-weapon state. Examples of launch platforms include fighter aircraft or missiles. In nuclear sharing arrangements, the ultimate decision regarding the use of the nuclear weapon remains, however, with the nuclear-weapon state – not the operator of the launch platform.[163]

Underlying the emergence of NATO's nuclear sharing arrangements was the decision of the United States to deploy US nuclear weapons in Europe. The first US nuclear weapons were deployed in the United Kingdom in 1954 at the latest.[164] The decision was based on several factors. Nuclear weapons in general played a major role in NATO's first military strategies (see section 3.2). This was due to the weakness of the conventional forces of the Alliance compared with the Soviet Union and with the conventional forces of the Warsaw Pact established subsequently in 1955. In 1952, NATO set ambitious targets for its members as regards strengthening their military capabilities, but these were soon found to be unrealistic. In addition, nuclear weapons were believed to enable the success of a conventionally weaker actor in a war against a stronger power. Technological advances also enabled the manufacture of tactical nuclear weapons with lower yields. These were regarded as suitable for use on the battlefield, too.[165]

The first US nuclear weapons deployed in Europe were nuclear shells for artillery use. During the 1950s, the United States also brought to Europe short-, medium- and long-range missiles, nuclear mines and fighter aircraft that could be equipped with nuclear weapons.[166] This resulted in a dramatic increase in US nuclear explosives on the old continent. The number of weapons peaked in 1971, which is when there were more than 7,000 US nuclear weapons in Europe. The inventory remained at around 7,000 until the early 1980s and then started a gradual decline.[167]

163 Kristensen et al., 2023, p.393.

164 Alberque, 2017, p.13. According to Gregory, the first US weapons may have been deployed in Europe already in 1952. See Gregory, 1996, p.17.

165 Gregory, 1996, p.16.

166 Gregory, 1996, p.17.

167 Kristensen, 2005, p.24.

NATO made the first formal decisions concerning US nuclear weapons in the 1950s. In December 1957, the NATO Heads of State and Government accepted at the first NATO Summit in Paris the proposal of the United States to establish stocks of US nuclear weapons in NATO countries. Washington, however, retained the decision-making power concerning any launch of the weapons and, even while in Europe, the weapons remained under US custody. It was, however, also agreed that, in the event of war, the US President could delegate decisions relating to the employment of nuclear weapons to SACEUR. This meant nuclear warheads could not be installed in weapons systems of Allies without US authorisation.[168]

Bilateral agreements between the United States and the host state have been an essential element of the nuclear sharing arrangement from the very beginning. There are three types of agreement. They cover matters including transfers of nuclear material and technology, exchange of information, and issues relating to storage of US nuclear weapons, safety and security. The military forces of the United States and the host state have also entered into a detailed technical agreement on how the nuclear stocks are maintained in practice. In 1957–1962, the United States concluded such agreements with Belgium, Canada, France, the Federal Republic of Germany, Greece, Italy, the Netherlands, Turkey and the United Kingdom.[169] US nuclear weapons were also deployed in these countries. They also provided delivery vehicles for launching nuclear weapons. The vehicles – in practice fighters – were put on Quick Reaction Alert (QRA) and were to take off for a mission within just minutes' notice where necessary.[170]

The end of the Cold War resulted in a considerable reduction in the number of US nuclear weapons deployed in Europe. The INF Treaty, which entered into force in 1987, banned ground-launched intermediate-range missiles. During the 1980s, the weapons inventory declined from the peak figures of the 1970s to around 4,000. A real change emerged in the early 1990s. In 1991–1992, the United States decided to unilaterally withdraw all of its ground- and sea-launched nuclear weapons from Europe, with only the B61 bombs carried by aircraft remaining in Europe. In 2000, there were only 480 US nuclear weapons left in Europe, and by 2007 the figure had dropped to below 200.[171]

168 Alberque, 2017, p.14.

169 Gregory, 1996, pp.20–21. France pulled out of the agreements in 1966 when it decided to leave NATO's military command structures. The United States withdrew its nuclear weapons from Canada in 1984.

170 Bell, 2021, p.32; Ruiz-Palmer, 2019, p.29.

171 Kristensen, 2005, pp.32–34; Kristensen et al., 2023, p.395.

Despite the disappearance of the confrontation of the Cold War, NATO did not want to entirely abandon the nuclear sharing arrangements. B61 bombs enabled the broad-based participation of Allies in NATO's nuclear deterrence policy and related burden-sharing, which was still considered important for NATO's cohesion. As an air-based weapons system, the B61 was also regarded as a flexible option for the maintenance of deterrence, and its range was long enough to reach Russia, if necessary. NATO no longer officially regarded Russia as a threat, but representatives of the Alliance referred to a potential "residual threat" regarding which readiness should still be maintained.[172]

Alongside reducing the number of nuclear weapons, NATO significantly lowered the readiness level of its nuclear forces. QRA fighters of Allies that had been earmarked for nuclear missions were turned into dual-capable systems. This means they could carry out other tasks alongside their nuclear mission. In 1995, aircraft with a nuclear mission no longer had to be capable of taking off for a mission within minutes but within weeks. In 2002, the readiness requirement was extended from weeks to months.[173] The reduction in the number of nuclear weapons also led to a reduction in bases hosting nuclear weapons in countries such as Germany. US nuclear weapons were fully withdrawn from Greece in 2001 and from the United Kingdom approximately in 2005.

The post-Cold War easing of the security environment eventually also affected the legitimacy of the entire nuclear sharing arrangement. At the turn of the 2010s, a fundamental debate took place in NATO concerning the future of the nuclear sharing arrangements. Germany in particular questioned whether the arrangements were worthwhile from the military perspective and wanted US nuclear weapons, unpopular in Germany's domestic politics, out of German territory. Germany's unilateral withdrawal from nuclear sharing arrangements would, however, have been a serious blow to the legitimacy and continuation of the arrangements.[174] The United States in turn was in favour of continuing nuclear sharing. At the 2010 meeting of NATO Foreign Ministers in Tallinn, then US Secretary of State Hillary Clinton outlined the US view of the future of NATO's nuclear deterrence policy. As part of her broader remarks emphasising the relevance of nuclear deterrence, Clinton underlined the importance of sharing risks relating to nuclear deterrence regardless of the Alliance aiming to further reduce the number of nuclear weapons.[175]

172 Bell, 2021, pp.45–46.

173 Bell, 2021, pp.47–48.

174 Michel and Pesu 2019, pp.96–98.

175 Bell, 2021, pp.47–48.

In response to the debate concerning its nuclear deterrence, NATO launched a Deterrence and Defence Posture Review (DDPR) process. Adopted by the Alliance at the 2012 Chicago Summit, the DDPR confirmed the importance and utility of nuclear deterrence and at the same time cemented the relevance of nuclear sharing in a world where the Alliance was not facing any immediate military threat. Especially the countries that had joined NATO after the Cold War were concerned about a pull-out of US nuclear weapons deployed in Europe leading to more extensive withdrawal of the United States from defence engagement in Europe.[176] As a compromise, however, the DDPR underlined that the Alliance would still seek to further reduce the number of non-strategic nuclear weapons deployed in Europe.[177]

The 2012 DDPR and Russia's first invasion of Ukraine in 2014 did not, however, end the debate on the future of the nuclear sharing arrangements. Germany's dual-capable PA-200 Tornado fighters were approaching the end of their service life. There was strong support in Germany for not replacing the dual-capable fighters, which would have meant withdrawing from the nuclear sharing arrangement. In the end, however, Germany decided to acquire F-18 Super Hornet aircraft for nuclear missions – a type of aircraft that had not yet been certified for such tasks. After Russia's invasion of Ukraine in February 2022, Germany decided, along with other NATO countries, to purchase F-35 fighter jets to replace the ageing dual-capable aircraft.[178]

3.6.2 NATO's nuclear sharing arrangements in the 2020s

Russia's full-blown invasion of Ukraine suspended, at least for a while, the debate on the relevance and justification of the nuclear sharing arrangements.[179] The legitimacy of the Alliance's nuclear deterrence has undeniably been reinforced, which is due to the greater readiness of increasingly aggressive Russia to use its nuclear weapons as a tool for political coercion.[180] Indeed, the current high threat environment will likely subdue political contestation concerning nuclear sharing among Allies, as "the vitality and internal legitimacy of NATO's deterrence posture and nuclear sharing arrangement depends on the existence of a perceived external threat".[181]

176 Thränert, 2011, p.3.

177 NATO, 2012.

178 Sprenger, 2022.

179 See e.g., Horovitz and Onderco, 2023.

180 Arndt et al., 2023.

181 Von Hlatky and Lambert-Deslandes, 2024, 529.

NATO's current nuclear sharing arrangement is the outcome of decisions made in the post-Cold War period. Despite the radical change in the security policy environment and the reforms currently underway in NATO's deterrence and defence policy, the Alliance has not made any major changes to its overall nuclear deterrence policy and posture. As far as is known, the United States has not increased the number of its non-strategic nuclear weapons in Europe, and no new countries have yet been included in nuclear sharing arrangements. That said, the Alliance is engaged in a noteworthy modernisation of its nuclear sharing efforts, taking place within the existing policy parameters, however. The older models of the B-61 nuclear gravity bombs are replaced by a modern model – B-61–12, and the Allies providing aircraft for nuclear sharing are also upgrading their fourth-generation fighters to the stealthy F-35. Furthermore, NATO is modernising its nuclear sharing related command and control system, and an increased emphasis is placed on the survivability of NATO's dual-capable aircraft and their associated infrastructure. Non-nuclear Allies are also increasingly taking part in conventional support measures. Additionally, the Alliance is developing its nuclear exercises and communicates about them more openly.[182]

As pointed out, the US nuclear weapons deployed in Europe are B61 gravity bombs. In the course of history, the United States has developed several different types of the weapon, which it is currently replacing with the new B61-12 which, like the older versions, has four yield options. The lowest (0.3 kilotonnes) corresponds to a massed use of conventional explosives in terms of yield. The highest yield (50 kilotonnes) is around four times that of the nuclear weapon used in Hiroshima in 1945. In addition, the modernised bomb has been provided with a guided tail kit thanks to which the bomb can be released 20–30 kilometres before the target – unlike the older versions of the bomb type that had to be transported to a point directly above the target before releasing the weapon. At the same time, the new guidance system considerably enhances the accuracy of the bomb, so using the bomb as a low-yield weapon is a more realistic option than before. Using a nuclear weapon with low accuracy would make it more difficult to fulfil the US nuclear doctrine requirement to specify the yield of a nuclear weapon in accordance with the needs of the operation and to avoid collateral damage. At the same time, the stealth features of the F-35 carrier make penetration of the adversary's air defences more likely.[183] The B61-12 bomb is not known to be operationally available yet but exercises to integrate the weapon onto dual-capable aircraft of Allies have been started.[184]

182 Bell, 2024.

183 Kristensen, 2018, pp.23–28.

184 Kristensen, 2023.

According to NATO, there are currently seven countries included in the nuclear sharing arrangement. The sites where US nuclear weapons are deployed are classified information, yet they are nevertheless commonly known: Belgium, Germany, Italy, the Netherlands and Turkey. In NATO, these countries are referred to as the DCA countries in reference to the dual-capable aircraft (DCA) they maintain. The United States has also deployed its own DCAs in Europe. In addition, Greece, which used to host nuclear weapons, apparently still maintains its capability to carry B-61 bombs as part of a contingency mission.[185] Through nuclear sharing arrangements, NATO Allies also participate in nuclear deterrence costs. The countries included in the efforts supply the fighter aircraft and staff and maintain the infrastructure, the maintenance and development of which is also co-funded by NATO. The United States is estimated to cover 22–24 per cent of the costs of the nuclear sharing arrangements, with the rest of the funding provided by other Allies.[186] Only around 5 per cent of operational US nuclear weapons are included in the nuclear sharing arrangements.

In **the Netherlands** nuclear weapons are deployed at Volkel Air Base. The country has F-16 fighters capable of carrying bombs, from which it is, however, transitioning to F-35 fighters. In March, the Commander of the Dutch Air Combat Command posted that the country's new F-35 aircraft have been adapted to launch and transport B61 bombs.[187]

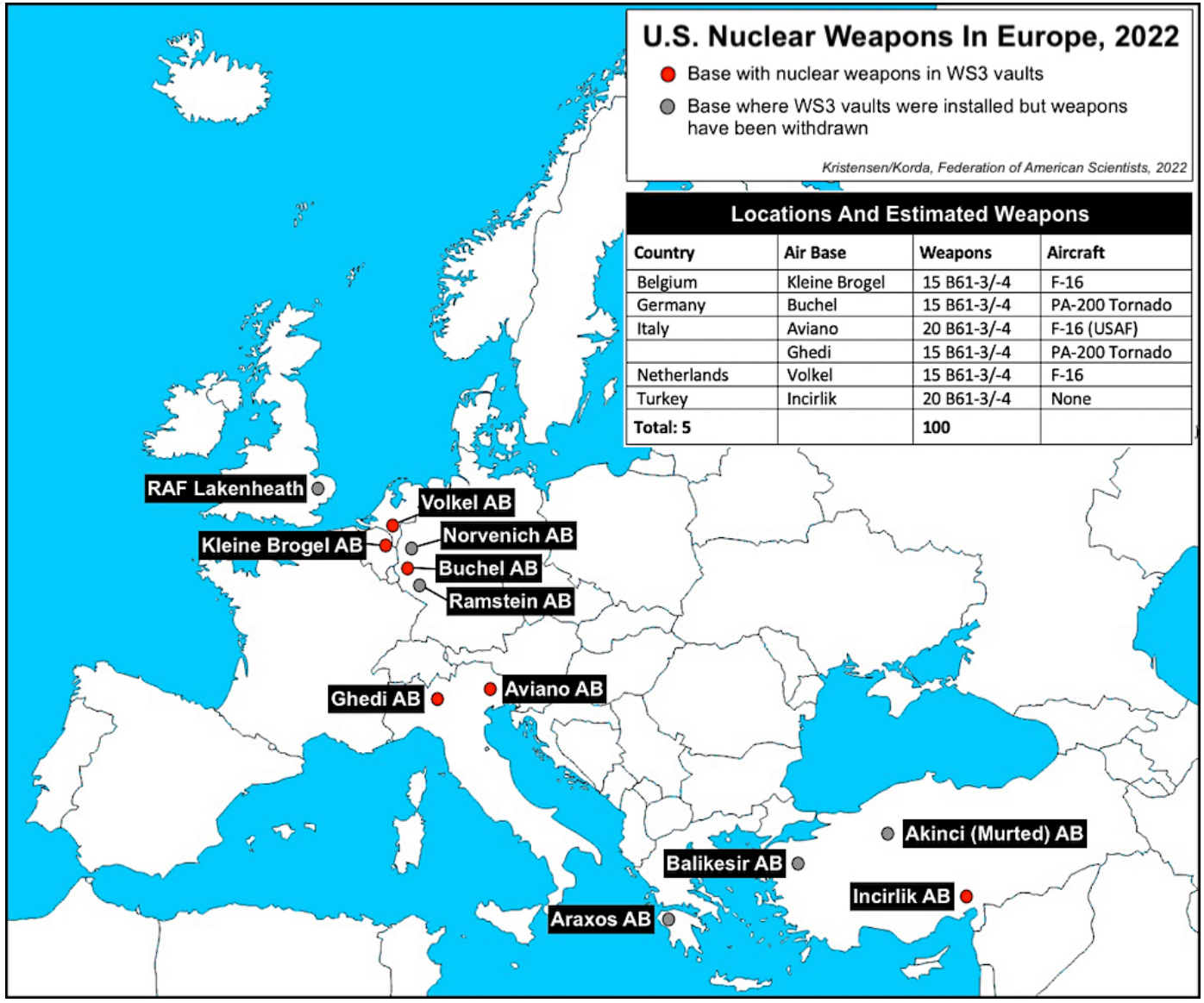
In **Belgium**, US bombs are deployed at Kleine Brogel Air Base. Like the Netherlands, Belgium has dual-capable F-16 fighters. Belgium will also be phasing in F-35 fighters as the present aircraft are ageing.

185 Kristensen, 2022.

186 Bunn, 2023, p.210.

187 Juonala, 2023.

Figure 3. US nuclear weapons in Europe (Korda and Kristensen, 2023).



In **Italy**, US tactical nuclear bombs are deployed at two bases: Aviano and Ghedi. The weapons deployed at Aviano are intended for use by US fighters. The B-61 bombs at Ghedi in turn are intended to be carried by Italian PA-200 Tornado fighters. As is the case with Germany, Italy's Tornado aircraft are ageing, and Italy is will also be phasing in dual-capable F35 aircraft.

In **Germany**, B61 bombs are only deployed at Büchel Air Base. Germany still uses ageing PA-200 Tornado fighters for nuclear missions but it is, as noted above, replacing them with US F-35 aircraft.

In **Turkey**, US nuclear weapons are located at Incirlik Air Base. The bombs are intended to be carried by US fighter aircraft, but there is currently no certainty of the capability of Turkish F-16 fighters to carry weapons. Turkey does not allow the permanent deployment of US fighters at Incirlik. In a crisis situation, they would have to fly to Turkey from elsewhere to pick up the B-61 bombs deployed in the country.[188]

Infrastructure relating to bomb hosting has been built at each of the bases mentioned above. Weapons are kept in Weapons Storage and Security Systems (WS3) with separate underground vaults for the storage of bombs. Infrastructure of the bases has been improved in recent years. All of the bases in use have capacity to host a considerably larger number of tactical nuclear bombs used by NATO. In addition to the active sites, there are also bases in Germany, Turkey and Greece that can, where necessary, be used for the storage of nuclear bombs.[189] These bases are marked on the above map with grey dots.

According to new public data, upgrades and repairs have been made with NATO funding at Royal Air Force Lakenheath in the United Kingdom, indicating a potential future role for the base in NATO's nuclear mission. Kristensen and Korda suggest that the possible reason is to increase NATO's operational flexibility through infrastructure development. New media reports indeed suggest that the United States may station B-61 bombs in the Lakenheath base in the coming years. During a potential nuclear crisis, US nuclear weapons deployed in Europe could be redistributed to other bases, making them more difficult to destroy.[190] Since US nuclear bombs have been stationed in the UK before, their redeployment could not yet be considered a significant change in the parameters of NATO's nuclear deterrence policy.

188 Kristensen et al., 2023, p.398.

189 Kristensen, 2022.

190 Korda and Kristensen, 2023. See also Precey 2024.

The only Ally openly critical of the current state of the arrangements is Poland, which has expressed its willingness to participate in nuclear sharing and to host US nuclear weapons.[191] The main reason for Warsaw's willingness to expand the nuclear sharing arrangements is the need perceived by it to increase NATO's deterrence and resolve in relation to Russia, which is actively signalling with nuclear weapons.[192] Washington, however, has been unenthusiastic about this. Referring to the wordings of the 1997 Founding Act between NATO and Russia, it has stated that it has "no intention, no plan and no reason" to deploy nuclear weapons in new countries.[193] The United States regards that it does not make military sense to deploy nuclear weapons closer to the front line – a view likely to be shared by the majority of NATO Allies. Many Allies consider bringing nuclear weapons closer to the Russian border as an unnecessary escalatory measure from which the Alliance should refrain.

3.7 Burden-sharing and conventional support for nuclear operations

In recent years, NATO has increasingly discussed burden-sharing relating to nuclear deterrence. This is broader than nuclear sharing, although the DCA arrangements are part of burden-sharing. In other words, NATO members have a whole host of opportunities to participate in operational activities relating to the implementation of NATO's nuclear deterrence policy by means of conventional armed forces or political means, too. The Communiqué of NATO's 2023 Vilnius Summit states that it is "imperative to ensure the broadest possible participation by Allies concerned in NATO's nuclear burden-sharing arrangements to demonstrate Alliance unity and resolve."[194]

NATO has created a specific arrangement for conventional support of nuclear operations, the history of which dates back to the 1950s operational plans of the Alliance.[195] This mechanism was previously known as Support of Nuclear Operations with Conventional Air Tactics (SNOWCAT), which referred to conventional air

191 Borger, 2022.

192 Kacprzyk, 2023.

193 Founding Act on Mutual Relations, Cooperation and Security between NATO and the Russian Federation, 1997.

194 NATO, 2023a.

195 See e.g. Nilsson 2010, p.292.

capabilities supporting nuclear operations, such as air refuelling or fighter aircraft that would be used to support dual-capable fighters flying nuclear missions.[196] There is, however, very little information publicly available about the history of the arrangement.

In recent years, NATO's interpretation of nuclear burden-sharing has broadened, and Allies can take part in supporting nuclear deterrence policy in more ways than earlier. Alongside SNOWCAT, the Alliance has started to speak of Conventional Support for Nuclear Operations (CSNO), which refers to a broader array of conventional capabilities supporting nuclear operations, not just means relating to the air domain. Allies without nuclear weapons and outside nuclear sharing arrangements can therefore contribute to NATO's nuclear operations in more ways than earlier. This may entail exchange of intelligence information, cyber and electronic warfare capabilities, anti-aircraft systems and long-range capabilities or provision of medical care services, for example. It is not in the public domain which countries are taking part in CSNO. Of the Allies, the United Kingdom, Poland, the Czech Republic, Hungary and Denmark are known – or at least have been known – to take part.[197] A total of 13–15 countries have taken part annually in the nuclear exercises of the Alliance, which provides an indication of the number of participating countries.

Alongside military means, Allies may also support NATO's nuclear deterrence policy through political means, too. Some Allies have, for example, provided their airspace for NATO's nuclear exercise, Steadfast Noon. For example, the 2023 exercise partly took place in Croatian airspace. If they wish, Allies can also host the NATO Nuclear Policy Symposium, the Alliance's most important nuclear policy event. In 2024, the event was organised in Skopje, Northern Macedonia.

196 See e.g. Gottemoeller, 2019.

197 Kristensen et al., 2023, p.394.

3.8 Nuclear exercises

Each year, NATO organises the Steadfast Noon exercise, where Allies taking part in nuclear sharing arrangements practise nuclear strikes and their preparation. Member countries participating in Conventional Support for Nuclear Operations (CSNO) also take part in the exercises. NATO used to provide very little information about its exercises. In recent years, however, it has increased the openness of its nuclear efforts.

The first press release of the exercise was published in 2021. As regards the 2023 exercise, it is known that it involved 13 Allied countries and a mix of aircraft types ranging from fighter jets to US B-52 bombers as well as refuelling and surveillance aircraft. In conjunction with the exercise, NATO underlined that, even though this was a strike exercise, there were no live nuclear weapons involved.[198]

Alongside nuclear strike exercises, NATO practices decision-making relating to the use of nuclear weapons, such as consultations between Allies and communication between NATO's various decision-making and preparatory bodies. There is very little public information about these Able Staff and Steadfast Nimbus exercises.[199] It is also not in the public domain whether the Crisis Management Exercises (CMX) focusing on the implementation of Article 5 include a nuclear element.

NATO's exercise activities relating to nuclear deterrence differ significantly from those seen in the Cold War years. That is when the Alliance regularly practised procedures relating to the use of nuclear weapons both in actual military exercises and in exercises simulating decision-making.[200] After the Cold War, NATO has made a clear distinction between exercises relating to conventional warfare and those relating to nuclear weapons, whereas in the years of Cold War both elements were present in its exercise activities. This meant that the scenarios simulated in exercises could involve escalation from conventional warfare to nuclear war.[201]

NATO's current segregation of conventional and nuclear deterrence is due to political reasons. France in particular wants to keep these deterrence elements clearly separate from each other, which is due on one hand to the country's nuclear deterrence regarded as national and on the other hand to its nuclear doctrine

198 NATO, 2023b.

199 Durkalec, 2015, pp.20–23.

200 Lunn, 2018, p.49.

201 See e.g., Ruiz-Palmer, 2019, pp.28–30.

where a clear distinction is made between conventional warfare and nuclear deterrence. NATO does, however, have Allies that seek stronger coherence between the conventional and nuclear components. The objective has, for example, been entered in the communiqué of a NATO summit.[202] Russia has integrated its nuclear deterrence and conventional warfare capabilities and regularly carries out exercises that simulate the escalation of conventional warfare to the use of nuclear weapons, for example, its joint strategic exercises or in exercises organised in conjunction with them.

NATO's exercises related to nuclear weapons do not, however, rely merely on the Alliance's own exercises. The nuclear-weapon states of the Alliance also organise their own national exercises relating to the use of nuclear weapons. Responsible for US nuclear weapons, the USSTRATCOM organises each year Global Thunder, a major exercise focusing on nuclear command, control and operational procedures. Allied countries also take part in the exercise.[203] France also organises its own annual nuclear exercises. For example, the quarterly Poker exercise simulates nuclear strikes conducted using Rafale fighters.[204] There is hardly any public information available about exercise activities of the United Kingdom. Former Commander of submarines, Rear Admiral John Gower writes that the United Kingdom does not launch live missiles in exercises and the UK Prime Minister, who decides on the use of nuclear weapons, does not exercise the decision against live adversaries in peacetime. Gower does, however, underline that the UK Nuclear Weapon Command, Control and Communications (UK NC3) architecture is tested and assessed continuously in contexts such as patrols of submarines carrying ballistic missiles.[205] The UK also conducts test launches for its Trident D5 SLBM, but the last two tests have resulted in failures.[206]

202 See e.g. Article 46 of NATO Vilnius Summit Communiqué: NATO, 2023a.

203 U.S. Strategic Command, 2023.

204 Kristensen, Korda and Johns, 2023.

205 Gower, 2019.

206 Beale, Jonathan and Andre Rhoden-Paul (2024).

4 Evolution of NATO's nuclear policy

4.1 NATO's decision-making on nuclear policy

NATO's decision-making relating to nuclear deterrence differs to some extent from the Alliance's other policy areas. The Alliance has a specific high-level body for discussing nuclear matters: the Nuclear Planning Group (NPG), which makes decisions on the implementation of the policies agreed and discusses policy issues associated with NATO's nuclear policy. Although the North Atlantic Council is NATO's highest decision-making authority, the NPG acts as the senior body on nuclear matters – there is no longer a corresponding body for other policy areas.[207] The work of the NPG is supported by the NPG High Level Group (HLG) and by the NPG Staff Group composed of national delegations of member countries and chaired by the Director of Nuclear Policy. Alongside official decision-making bodies, the Alliance has several informal groups of varying compositions discussing nuclear policy. The Allies also consult each other on issues relating to NATO's nuclear deterrence.

Over the course of history, NATO's decision-making system relating to nuclear weapons has evolved in response to challenges concerning nuclear deterrence and the coherence of the Alliance as a whole. On the one hand, the formation of the system has been affected by the desire of the nuclear-weapon states of the Alliance – particularly the United States – to retain autonomy in decision-making relating to nuclear employment. Inclusion of Allies in debate on nuclear weapons has also been a channel for the United States to educate Allies concerning nuclear matters and a way to bolster Allies' trust in the credibility of US extended deterrence, which is one of the historical sources of mistrust within NATO.[208] Maintenance of trust in turn has curbed aspirations among Allies to develop their own nuclear weapons, which has been a key aim of the United States. Instead, non-nuclear-weapon Allies have sought a say in nuclear policies of nuclear-weapon states and even in potential use of a nuclear weapon.

207 In 1963–2010, the other body at the same level was the Defence Planning Committee, which was abolished in conjunction with the committee reform of the Alliance.

208 Pesu and Sinkkonen, 2024.

In the context of NATO's decision-making relating to nuclear weapons, a difference should be made between peacetime policy formulation and operational decisions in times of crisis.[209] While the Alliance has been able to create quite a clear decision-making model for peacetime activities, there are question marks over its capacity to decide on the use of capabilities within the nuclear sharing arrangements. On paper, the decision-making model relating to conducting a nuclear mission is as such clear. NATO has outlined publicly that a political decision by the NPG is required for a nuclear mission to be undertaken. In addition, any mission requires authorisation by the US President and the UK Prime Minister.[210]

In practice, however, it may be challenging to come to an agreement on nuclear employment, as the Alliance does not necessarily have highly tuned operating models approved by the Allies for how B61 bombs would actually be used. Jeffrey H Michaels has shown in his study how NATO Allies failed to reach a mutual understanding during the Cold War on the authorisation of nuclear use at the multinational level. In other words, due to differences in opinion between Allies, NATO did not have clear procedures for the actual use of nuclear weapons included in the nuclear sharing arrangements. This could have led to chaotic decision-making during a crisis.[211] No direct conclusions for the present day can, of course, be drawn from the situation during the Cold War. It should, however, be assumed that decision-making between Allies is at least not easier than during the Cold War when the number of NATO members was considerably smaller.

4.1.1 Nuclear Planning Group

NATO's Nuclear Planning Group (NPG) was founded in 1966, fifteen years after the signing of the North Atlantic Treaty. Leading up to the decision was a period of several years during which the United States in particular sought to commit Allies to its nuclear policy. The first initiatives discussed within the Alliance related to the multilateral control of nuclear capabilities. The best-known proposal concerned the formation of the Multilateral Force (MLF). The core of the US idea proposed in 1960 was to create a multilateral surface ship fleet carrying nuclear weapons. Its multilateral crews operating under NATO military command would have consisted of personnel from different Allied countries.

209 Gregory, 1996, p.33.

210 NATO, 2022b

211 Michaels, 2022.

Underlying the initiative was a desire to formalise the internal nuclear sharing arrangements of the Alliance and at the same time to ensure Allies would not pursue the development of their own nuclear weapons. The MLF sought in particular to satisfy West Germany's desire to gain a stronger voice in NATO's nuclear policy instead of the country having ended up developing national nuclear capability. The Allies did not, however, reach agreement on the technical, political and military aspects of the initiative, and it was abandoned by 1965. The disagreements mainly related to decision-making and financial issues. The thought of paying for nuclear missiles, the use of which would in any case be ultimately decided by the United States, did not appeal to European Allies.[212]

The desire to guarantee the Allies' voice in NATO's nuclear policymaking did not subside, however. To solve the participation problem, the Alliance moved from "hardware" to "software" solutions. In other words, solutions were now sought not from shared capabilities but from participatory decision-making and consultation mechanisms. At a meeting of NATO Defence Ministers in summer 1965, US Secretary of Defense Robert McNamara proposed the establishment of a committee focusing on nuclear consultation. The Nuclear Planning Group (NPG) was established in 1966 and held its first meeting in 1967. The creation of the NPG was based on the US view that tensions relating to nuclear weapons within the Alliance stemmed from the Allies' lack of information. The consultation forum enabled the Allies being offered a nuclear education, so the NPG originally also had a pedagogic purpose.[213]

The NPG initially had only seven members. The United States, the United Kingdom, the Federal Republic of Germany and Italy were permanent members, while the other three seats rotated among Allies. By contrast, all of the Allies took part in the Nuclear Defence Affairs Committee (NDAC), which was established in conjunction with the founding of the NPG and eventually merged with it. The rotational membership of the NPG ended in 1979, and since then all NATO members apart from France have taken part in the NPG's work.[214]

212 See e.g. Kaplan, 2004, pp.38–41; Alberque, 2017, pp.17–25.

213 For a comprehensive article on the origins of the NPG, see Sayle, 2020.

214 NATO, 2022c.

During the Cold War, the NPG met twice a year at Defence Minister level and more regularly among Ambassadors. After the end of the Cold War, the significance of nuclear deterrence declined in NATO's collective defence. Nuclear matters were discussed less frequently. The NPG continued to meet at Defence Minister level once or twice a year, but the Ambassadors' meetings ended.[215] The NPG meetings also became slimmer in terms of substance. Over the past ten years, the role of nuclear weapons has been growing again, which has increased the political clout of the NPG and the items on its agenda.

NATO does not provide public access to the contents of NPG meetings. According to NATO, the NPG provides a forum for all Allies to discuss NATO's nuclear policy and posture. In practice, the NPG's discussions may cover topics including matters relating to NATO's nuclear sharing arrangements or nuclear exercises. The NPG also negotiates on how NATO communicates about its nuclear deterrence. The NPG is chaired by the NATO Secretary General.

An essential part of the NPG's activities is the NPG Staff Group, which prepares the NPG meetings and is regarded as the actual engine for the consideration of nuclear matters and the group where matters discussed by the Defence Ministers are prepared in practice. The NPG Staff Group meets on a weekly basis and is chaired by the Director of the Nuclear Policy Directorate (NATO's Nuclear Policy Director), who is always a US official.

4.1.2 High Level Group

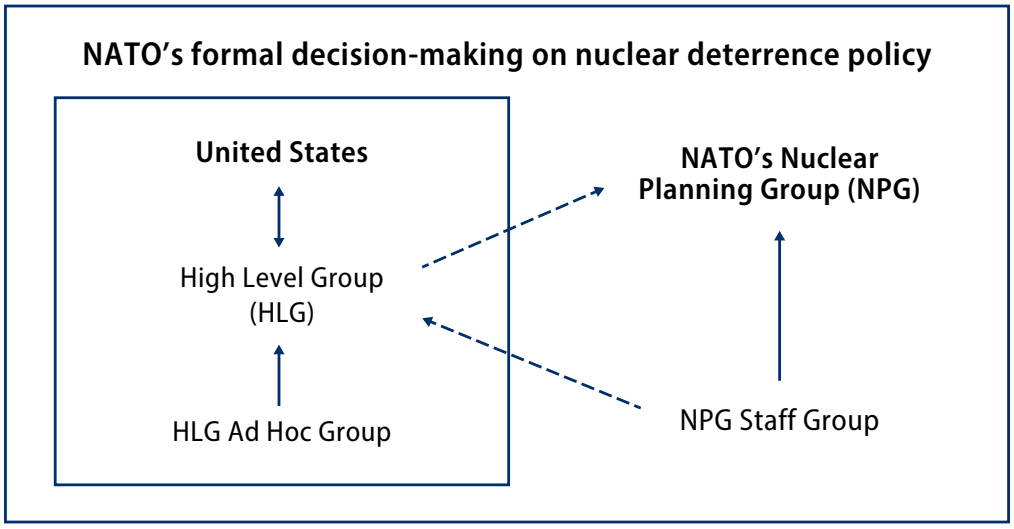
The work of the NPG and the NPG Staff Group is supplemented by the High Level Group (HLG). Established in 1977, the HLG differs from NATO's committee practice in that it is chaired by the United States. The HLG was originally created in response to US concern about nuclear consultations within NATO not receiving sufficient attention in national capitals of the Alliance. Another special characteristic of the HLG is that its members are senior officials from national defence administrations[216]. The HLG meets regularly, with the frequency depending how active and eager the US administration is in terms of making use of the HLG at any given time.

215 See e.g. Lunn, 2018, pp.41–42. In theory, the NPG can still have meetings of Ambassadors and even Heads of State and Government.

216 Lunn, 2018, p.43.

The relationship of the HLG to the activities of the NPG is not entirely unambiguous. The HLG mainly addresses matters relating specifically to US nuclear capabilities. Topics are often technical and practical: the HLG may, for example, discuss matters relating to the US B61 bomb. Discussions are also less tied to NATO's nuclear agenda and may therefore be freer than within the NGP. At times, member states also transfer difficult issues from the NPG Staff Group to the HLG in order to reach solutions at a level of officials higher than the NPG Staff Group. The HLG's work is supported by the Ad Hoc Working Group of officials preparing the agenda for each HLG meeting. Reports on the HLG's discussions are distributed to the NPG Defence Ministers.[217]

Figure 4. NATO's formal decision-making on nuclear policy



217 Lunn, 2018, p.43

4.1.3 Informal groups

Consultations in informal groups are an essential part of decision-making within NATO. [218] This also applies to nuclear matters.[219] Allies discuss matters relating to nuclear deterrence in numerous different groups of continuously varying compositions. One of the noteworthy groups is the P3 bloc of Western nuclear powers that are members of the UN Security Council: the United States, the United Kingdom and France. The P3 may, for example, seek a common position on nuclear policies included in communiqués of NATO summits. Informal groups are particularly important for France as they provide Paris, which refrains from taking part in the NPG and the HLG, access to influence on NATO's nuclear deterrence policy. NATO's nuclear powers also engage in a bilateral dialogue on deterrence.[220] Often they also want to consult their non-nuclear weapon Allies.

Other corresponding groups include the DCA countries – Allies where the United States has deployed its B61 nuclear weapons and that provide their fighter aircraft for NATO's nuclear operations. Many non-nuclear weapon Allies that are outside the nuclear sharing arrangements seek active consultation contacts with DCA countries. These countries also conduct consultations on matters in varying groups among each other, seeking coalitions of likeminded Allies. The creation of groups is often based on the personal activeness of officials, which means coalitions may undergo frequent changes.

4.2 Diversity of nuclear profiles among NATO member states

There are major differences in NATO member states' profiles as regards to the level of participation in the Alliance s nuclear policy. However, NATO countries cannot be classified explicitly into any specific subgroups or "tribes". Different levels of participation can be identified based on the political intent, military capabilities, and available resources of NATO countries. Nuclear capabilities are also largely built on not only material capabilities but, in addition, on elements of capability related to personnel and human resources, exercises, facilities as well as various administrative support measures. Each NATO member state always ultimately decides for itself how and with what resources it takes part in NATO's nuclear policy – or whether it takes part at all.

218 Mayer and Theiler, 2014.

219 Lunn, 2018, p.44.

220 See e.g. Michel and Pesu, 2019, pp.46–49.

According to Robert Bell, there are certain key variables that influence the national approach, particularly as regards whether a country seeks to participate in nuclear sharing. These include national threat perceptions, available resources, degree of public support and/or opposition towards nuclear weapons, transatlantic relations, and the overall level of activity and commitment in relation to NATO's collective defence.[221] Secondly, geographical location can be a defining factor in the formulation of Allies' nuclear policy: NATO's frontline states such as Poland, tend to regard the nuclear threat posed by Russia as more significant than Western Allies do, explaining Poland's desire to participate in NATO's nuclear sharing arrangements. Thirdly, national views on nuclear policy are impacted by various domestic policy factors such as government coalitions.

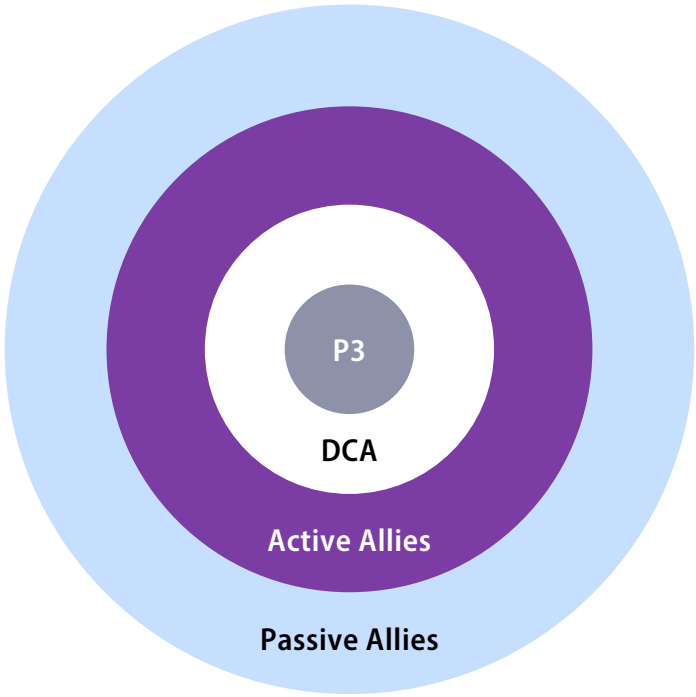
The most central and easy-to-identify group in the Alliance is formed by its nuclear powers: the United States, the United Kingdom and France, that is, the P3 countries. They in themselves form a group of their own and conduct bilateral and trilateral discussions on nuclear policy. The differences between the countries are, however, highlighted in their different levels of participation in nuclear policy, with France being a special case as it does not take part in NATO's decision-making on nuclear policy. The deterrence concept of France also differs considerably from the views of the United States and United Kingdom, which see conventional and nuclear deterrence as part of the same continuum. France, instead, draws a clear line between conventional capabilities and nuclear weapons. Although conventional capabilities are regarded as having threshold value, the French view is that it is only nuclear capabilities that form the actual deterrence.[222]

Another important group in terms of level of ambition is the DCA countries, that is, the countries included in NATO's nuclear sharing arrangements. These Allies have deliberately progressed further in NATO's nuclear deterrence policy, as they have a closer relationship with the United States in the nuclear deterrence context than other Allies. In particular Belgium, the Netherlands, Germany and Italy meet and consult each other regularly concerning Alliance nuclear policy.

221 Bell, 2021, p.232.

222 See e.g. Tertrais, 2020.

Figure 5. NATO nuclear profiles



The third group consists of countries that participate actively in NATO's decision-making on nuclear policy and in activities such as exercises but are not included in the Alliance's nuclear sharing arrangements. There is very little public information available on the specific roles and levels of participation of NATO Allies, but countries such as Denmark, the Czech Republic and Poland have been mentioned in various contexts as active in this respect. The fourth group consists of countries with neither significant material capabilities nor the willingness to assume a more active role in NATO's nuclear policy. They do, however, participate in NATO working groups and decision-making concerning nuclear policy, but they are not necessarily proactive but rather in a passive observant role. This group includes NATO countries with lesser resources and military capabilities.

Overall, the following conclusion may be drawn from the different nuclear profiles. The greater nuclear capabilities the country has at its disposal and the more actively it participates in NATO's nuclear policy, the closer it is to the core of NATO's nuclear decision-making and the better it gets its voice heard in NATO's nuclear decision-making. Correspondingly, countries assuming a more passive role have poorer opportunities to advance matters that are important for them, unless they win the backing of a major nuclear-weapon state, primarily the United States.

It is also clear that no country can promote interests that are important for it single-handedly. Instead, coalition-building plays an important role in decision-making and its preparation. Coalition-building also takes place through informal channels in various discussion groups, such as through members of the NPG Staff Group. For example, Finland faces expectations concerning participation in active discussions with the other Nordic countries on issues relating to nuclear policy. Indeed, Finland's close Nordic Allies Norway and Denmark are examples of how, regardless of reservations concerning nuclear weapons in the domestic policy environment, the countries have taken part in outlining and implementing NATO's nuclear deterrence policy.

As regards **Norway**, factors in the post-World War II security environment have had a major impact on the country's approach to nuclear weapons and NATO's nuclear deterrence policy. Immediately after the end of World War II, concerns in Norway grew as regards how the Soviet Union would take Norway's decision to join NATO. Relationship with the eastern neighbour also affected Norway's positioning regarding the Alliance's nuclear weapons. Balancing between deterrence and reassurance and between NATO integration and its limitation was established as the leading idea of Norway's security and defence policy during the Cold War period.[223] An example of the reassurance policy and limitation of depth of NATO integration was Norway's decision, which is still in force today, not to allow nuclear weapons or permanent bases on Norwegian territory in peacetime. On the other hand, on the military side, the Royal Norwegian Air Force reportedly participated in NATO's SNOWCAT activities, including nuclear exercises. Likewise, Norway strengthened its capacity to receive Allied nuclear reinforcements.

In the early 1950s, as the significance of nuclear weapons increased, Norway had to formulate its national position regarding NATO's nuclear policy. Intensive critical public debate on nuclear weapons and, on the other hand, the threat of pollution caused by Soviet nuclear tests, resulted in Norway becoming an active advocate of limitation of nuclear testing and non-proliferation of nuclear weapons. Norway's active arms control profile and in places critical views on nuclear weapons pushed the country to the outer circle of nuclear policy discussions in NATO.[224] More recently in 2005–2013 centre-left coalition government of the Labour Party, Socialist Left Party and Centre Party sought to advance nuclear disarmament with a humanitarian initiative. This resulted in the international Conference on the back of the Norwegian-initiated "humanitarian initiative" for nuclear disarmament,

223 Cameron 2024.

224 Frühling and O'Neil, 2023, p. 84, p.88.

impacting the drafting of the TPNW that was adopted by 122 non-nuclear-weapon states in 2017.[225] Norway's policy in favour of nuclear disarmament was, however, soon reversed as the right-wing government elected in 2013 distanced itself from the humanitarian initiative.[226]

Even though relations between Norway and Russia warmed after the Cold War, the focus of Norway's defence policy did not shift: the Arctic region and the Kola Peninsula remained underlying concerns in in Norway's security and defence policy. Consequently, Norway has again deepened its defence cooperation with the United States in recent years.[227] Among other things, the countries updated their bilateral Defence Cooperation Agreement following Russia's invasion of Ukraine in spring 2022. The agreement reiterates Norway's traditional policy of prohibiting peacetime deployment of nuclear weapons on the Norwegian territory. There is no definite knowledge on Norway's current participation in NATO's nuclear deterrence policy. For example, it has not announced its participation in the Steadfast Noon exercise. Background discussions conducted for this report indicate, however, that Norway has been showing increased interest in NATO's nuclear policy.

As regards **Denmark**, the main motive for nuclear policy formulation has been the anti-nuclear weapons and anti-nuclear power sentiments seen in domestic policy debate and public opinion. The Danish stance on nuclear weapons took shape in the 1950s. The key policy issue was whether NATO as an Alliance should defend Denmark with nuclear weapons against the threat posed by the Soviet Union. As a sum of many factors, Denmark, like Norway, ended up prohibiting the peacetime deployment of nuclear weapons on its territory.[228] This decision has had a variety of consequences. For decades, Denmark has adhered to a strict national policy of not producing nuclear energy, and it also banned the mining of radioactive elements in Greenland for over two decades. In addition, Denmark was one of the first countries in the world to legislate controls on radioactive substances and called for the cessation of nuclear testing in the 1950s. Denmark was the fourth country in the world to ratify the Treaty on the Non-Proliferation of Nuclear Weapons (NPT) in 1969.[229]

225 Egeland, 2019, pp. 468.

226 Egeland, 2019, pp.468–90.

227 Frühling and O'Neil, 2023, p.71.

228 Søborg Agger and Woolgaard, 2006, pp.67–84.

229 Vestergaard, 2014, pp.106–8.

Despite the critical political line, the Danish approach to nuclear weapons has featured shades of grey, particularly regarding military activity. The United States stored nuclear weapons in Greenland between 1958 and 1965 and, correspondingly in 1957–1992, naval vessels capable of carrying nuclear weapons repeatedly visited ports in Denmark, Greenland and the Faroe Islands. Strategic bombers equipped with nuclear weapons were also allowed to access Danish airspace.[230] Today, the Danish tone of voice concerning nuclear weapons remains cautious. Within NATO, however, Denmark is known as an active participant in decision-making on nuclear policy, and the country is reportedly also involved in Conventional Support for Nuclear Operations (CSNO), including nuclear exercises.[231]

As is the case with Finland, for **Sweden** becoming part of extended deterrence is a new element in the country's security and defence policy, and the need to reinforce understanding about the nuclear deterrence of the Alliance has been recognised in Sweden.[232] NATO's nuclear deterrence policy opens a new playing field for Sweden, too. Stockholm's stance on nuclear weapons has historically been dichotomous. Sweden had its own nuclear weapons programme from the mid-1940s until the 1970s.[233] Partly thanks to the legacy of the abandoned nuclear weapons programme, Sweden possesses a good level of technical and intelligence competence related to nuclear weapons. On the other hand, as part of its normative foreign policy, Sweden has, from the 1970s onwards, profiled itself as a highly active advocate of nuclear arms control. There is also active civil society calling for nuclear disarmament in Sweden, and nuclear weapons are a more prominent and sensitive issue in domestic politics than in Finland. However, so far, Sweden's stance on NATO's nuclear policy has been similar to that of Finland. In February 2023, Swedish Minister for Foreign Affairs Tobias Billström stated that Sweden is joining NATO without reservations but does not foresee having nuclear weapons on its territory in peacetime.[234] Prime Minister Ulf Kristersson has again stated that Sweden is open to the possibility of possessing nuclear weapons in the event of war. [235]

230 Vestergaard, 2014, pp.109–11; Søborg Agger and Woolgaard, 2006, p.83.

231 Kristensen et al., 2023.

232 See e.g. Aronsson, 2023, p.1.

233 Jonter, 2016.

234 Billström, 2023.

235 Szumski 2024.

5 Implications of NATO's nuclear deterrence for Finland

Finland has historically approached international nuclear issues from the perspective of disarmament and arms control. On the one hand, Finland has promoted discussions between nuclear-power states on strategic stability and arms control. Over the course of history, Finland has, among other things, advocated for a nuclear-weapon-free zone (NWFZ) for Northern Europe and facilitated discussions for a Middle East NWFZ. In Finland, nuclear weapons have also been examined from the viewpoint of regional security. Already before its accession to NATO, Finland regarded the presence of the Alliance and its deterrence – based on nuclear weapons – as a factor with a stabilising effect on the Baltic Sea region.[236] The analysis of Finland's security environment provided in the Government's Defence Report of 2021 includes concern about there being "a threat that the threshold for using low-yield tactical nuclear weapons will decrease".[237]

NATO membership introduces a new dimension to this. The idea of a deterrent or threshold produced with national capabilities is deeply ingrained in Finnish strategic culture.[238] As a member of NATO, Finland's deterrence mix is complemented by nuclear deterrence, as the country is included in the extended deterrence of the Alliance and in particular of the United States, that is, under the nuclear umbrella. Any military aggression against Finland may therefore in an extreme case scenario result in retaliation carried out by Finland's Allies by means of nuclear weapons.

As a member of NATO, Finland has the opportunity to participate in NATO's decision-making and policymaking concerning nuclear deterrence policy. If it wishes, Finland can also participate in operational activities supporting NATO's nuclear deterrence, too. NATO's nuclear deterrence policy opens up a new political playing field for Finland, providing Helsinki with several different options as regards the level of ambition and activity.[239] As described in the sections above, NATO Allies have different stances on nuclear deterrence and divergent roles in its practical implementation.

236 Finnish Government 2016, p.14.

237 Finnish Government 2021, p.13.

238 See e.g. Salonius-Pasternak, 2019; Hanska, 2019, Pihlajamaa and Särkkä 2024.

239 Pesu and Juntunen, 2023.

5.1 Finland's responsibilities and options in NATO's nuclear policy

Finland's doors to decision-making on NATO's nuclear deterrence policy did not open until the accession day on 4 April 2023. In June the same year, then Minister of Defence Antti Kaikkonen was the first Finn to attend a NPG meeting.[240] Finns have also already attended meetings of the HLG, and Finland has a representative in the NPG Staff Group. Participation in nuclear deterrence policy was in itself already a political decision – albeit an expected one. Of NATO members, only France does not participate in NPG work.

Finnish decision-makers underlined from the first moments of the NATO application process that Finland will not impose any advance restrictions on its activities in the Alliance. This policy was cemented in the 2023 Programme of Prime Minister Petteri Orpo's Government, which, among other things, states that "Finland will participate fully in all NATO activities, including NATO's collective peacetime missions" and that "Finland will participate in NATO's missions and operations, international exercises, and committees and working groups, including the Nuclear Planning Group."[241] This means that Finland has not, unlike for example Norway or Denmark, imposed its own political restrictions on the depth of NATO cooperation.

NATO's nuclear policy has attracted a fair deal of attention in Finnish debate. Attention has mainly focused on any potential stationing of nuclear weapons in Finland – an option that Finnish decision-makers and NATO representatives have regarded as remote and theoretical.[242] This means that Finnish debate has yet to progress to much detail, with the prerequisites for any in-depth discourse also still yet to emerge. Finland is only growing its competence relating to nuclear deterrence. The need to strengthen national competence is also outlined in the current Government Programme.[243]

However, several opinion polls have been conducted during 2023–2024 that give an indication of public opinion and its development in relation to NATO's nuclear deterrence policy and Finland's alternatives for contribution. In spring 2024, the majority of Finns believed that the country should participate in NATO's nuclear policy decision-making and the Alliance's nuclear exercises. A clear majority (72 per cent),

240 Finnish Government, 2023a.

241 Finnish Government 2023b, p.160.

242 Kervinen, 2022; Keski-Heikkilä and Nalbantoglu, 2023.

243 Finnish Government 2023, p.178.

on the other hand, opposed the deployment of nuclear weapons on Finnish soil. 42 percent of Finns would have been willing to allow nuclear weapons to be transported through Finland. This idea was opposed by 45 per cent of citizens. On the latter issue, public opinion has changed during NATO membership. In June 2023, only 27 per cent of Finns had a positive view of the matter.[244] There is only preliminary data available on the opinions of Finnish decision-makers, however. According to the data, 48 per cent of Members of Parliament were of the opinion that Finland had to be ready to participate in exercises and development relating to the use of collective nuclear deterrence, whereas 43 per cent were not yet able to provide their opinion on the matter.[245]

NATO membership and, in particular, the nuclear policy of the Alliance have activated Finnish civil society actors. In 2022, a Nuclear Weapons Monitoring Group consisting of politicians, researchers and civil society organisation activists was founded in Finland. The group has published reports on topics including nuclear policy. It has recommended that Finland should adopt a reserved stance on NATO's nuclear exercises and on participating in them. According to the group, "Finland should maintain an open attitude towards the Treaty on the Prohibition of Nuclear Weapons and continue to participate in its meetings as an observer".[246]

Finland's options in NATO's nuclear deterrence policy can be boiled down to three potential approaches from a passive, low-ambition policy all the way to a highly active strategy seeking to expand and change NATO's current solutions.[247]

First, a passive policy would mean a cautious stance on nuclear weapons issues. Finland would participate in the activities of the NPG and its supporting bodies but would not necessarily actively formulate positions on items on the agenda. In this approach, however, Finland would not take part in operational activities relating to nuclear deterrence policy, such as the CSNO mechanism or NATO's nuclear exercises. The cautious policy would be motivated by a desire to maintain a certain distance to nuclear deterrence.

244 Wass, et al. 2024.

245 Salonius-Pasternak, 2023.

246 Nuclear Weapons Monitoring Group, 2023.

247 Pesu and Juntunen, 2023, pp.5–6. See also Alberque, 2022b.

Secondly, a policy representing a higher, medium-level ambition in turn would be built on active participation in nuclear deterrence planning. Having strengthened its nuclear competence, Finland would formulate clear Finnish positions on various topics and consult its Allies – such as nuclear-weapon states and countries included in the nuclear sharing arrangements – outside official decision-making forums. In this approach, Finland would adopt a clear role in NATO's nuclear policy burden-sharing. This would mean a military contribution to conventional support for NATO's nuclear policy, with Finland providing a weapon system or some other capability – for example intelligence or medical care – for use by the CSNO mechanism. This would also mean Finland taking part in NATO's annual Steadfast Noon exercises.

Figure 6. Finland's policy options in NATO's nuclear deterrence policy

Thirdly, a high-ambition strategy would involve an active planning role and, in addition to military support measures, seeking inclusion in one way or another in NATO's nuclear sharing arrangements. Finland could aim for the certification of its upcoming F-35s to a dual-capable role, in other words, to carry US B61 bombs.[248] It could also, in the same way as Poland, seek to host US nuclear weapons on its territory. The materialisation of these options would not depend merely on Finland.

248 Kuhn, 2023.

Instead, it would require a fundamental shift in both NATO and US policy. The matter would require thorough consideration in the NPG as well as the HLG.[249] As noted above in this report, no such shift is presently in sight.

The approach Finland will choose depends on several factors. From the military perspective, the essential factor is the credibility of nuclear deterrence as a safeguard for the defence of NATO and of Finland itself. Finland's geographic specificities also include its location on the front line close to areas that are strategically important to Russia, such as the Kola Peninsula and the St Petersburg region. In other words, Finland is located close to targets of US intercontinental nuclear weapons. Finland will also have to consider which military capabilities it can afford to earmark for NATO's collective measures without jeopardising its own national defence. The general lines of Finnish policy must also be legitimate from the perspectives of the political landscape and public opinion, even though Finland's potential participation in, for example, the CSNO mechanism or NATO's nuclear exercises will most likely be non-disclosable information.

Before deliberating more active options and contributions, Allies hope to see Finland first strengthen its understanding of nuclear deterrence and NATO's nuclear policy.[250] There is no rush or pressure for a military contribution, for instance. Nuclear policy is not, for example, part of the NATO Defence Planning Process, where each Ally is given capability targets.[251] Debate on the strengthening of Finnish nuclear competence commenced already in the late 2010s, after which several initiatives have emerged within Finnish government and expert community to enhance the national "nuclear IQ". Participation in the NPG's activities and the consequent access to information will in itself improve the understanding of key central government actors of NATO's nuclear deterrence policy. It was brought up by officials of NATO International Staff and Allies in several background discussions conducted for this report that, compared with many Allies, Finnish nuclear competence is already rather good, although there is naturally room for improvement.

249 IISS, 2023.

250 See e.g. Salminen, 2022.

251 See e.g. Pesu and Iso-Markku, 2022.

Another current issue relates to the Finnish Nuclear Energy Act. Section 4 of the Nuclear Energy Act currently in force states the following: "Import of nuclear explosives as well as their manufacture, possession and detonation in Finland are prohibited."[252] The prohibition was added to the Act in the 1980s, which is when debate took place in Finland on whether for example the Soviet Union could station nuclear weapons in Finland under the Finno-Soviet Treaty of 1948. With the prohibition initiated by the Finnish Ministry for Foreign Affairs, this potentiality was averted by making it illegal.[253] There has been some debate in Finland on whether the prohibition should be amended or even abandoned, for example as part of the comprehensive reform of the Nuclear Energy Act currently underway.[254] Swift changes are not expected, however. In May 2024, Prime Minister Petteri Orpo declared that there is no urgent need to open up the nuclear weapons related parts of the Nuclear Energy Act.[255]

The Act does not prevent Finland from taking part in NATO's decision-making on nuclear policy, conventional support measures or exercise activities. The Foreign Affairs Committee of the Finnish Parliament has stated in its report that "according to the information received, no aspects have emerged in negotiations between Finland and NATO that would justify amendments to Finnish legislation relating to nuclear explosives".[256] Some NATO countries have corresponding prohibitions in their legislation, although not to quite the same extent. For example, the Constitution of Lithuania prohibits any weapons of mass destruction on the territory of Lithuania.[257]

In principle, however, there are conceivable scenarios where Finnish legislation currently in force may restrict NATO's operational activities. These all relate to emergency conditions or an actual state of defence. There is no peacetime need to bring nuclear weapons to Finland, unless NATO decides to carry out a profound reassessment of the fundaments of its nuclear policy. One of the potential scenarios is a need to disperse, as a protective measure, the forward-deployed US B61 nuclear weapons from their peacetime bases to sites across the Alliance.[258] Another conceivable potentiality is the need of an Ally's aircraft carrying nuclear weapons

252 Nuclear Energy Act, 1987.
253 Paju, 2020, pp.45–46.
254 MTV News, 2023.
255 Alentola, 2024.
256 Foreign Affairs Committee, 2022, p.7.
257 Erästö, 2023, p.15.
258 See e.g. IISS, 2023.

to use Finnish airspace as part of a NATO military operation.[259] A third potentiality is a NATO Ally wanting to defend Finland with nuclear weapons on its territory – a highly remote scenario that, however, is currently prohibited under Finnish law.

5.2 Implications of NATO membership for arms control policy

Finland's stance towards nuclear weapons has historically been characterised by a strong emphasis on disarmament and arms control. Finland has been profiled particularly as a staunch supporter of the NPT and the regulatory regime built around it. Finland has traditionally underlined the responsibility of the five nuclear-weapon states recognised under the NPT and their practical significance in maintaining international order and strategic stability and in promoting nuclear disarmament. This has been reflected in decisions where Finland has not supported any further-reaching nuclear disarmament initiatives that nuclear-weapon states would probably oppose.

The small-state liberalist profile concerning nuclear disarmament and arms control policy is likely to determine Finland's activities as a NATO member, too. As regards nuclear arms control, Finland's priorities will most likely be characterised by three key premises, which for their part reflect NATO's dual-track policy described above:

1. Staunch support for the NPT and the regulatory regime built around it.

2. Emphasis on timely arms control initiatives as a counterweight to a policy aiming to strengthen NATO's nuclear deterrence.

3. Upholding arms control questions in accordance with Finland's immediate security interests in NATO's internal discussions.

As regards support for the NPT, the long-term line of Finnish nuclear disarmament policy can be described as small-state liberalist.[260] The foundations, although subsequently having been slightly modified, for the policy line were created already in the 1950s following Finland's accession to UN membership. Ralph Enckell, then

259 In addition to an aircraft, an Ally's cruise missile loaded with a nuclear warhead might use Finnish airspace.

260 See, Juntunen, 2019; 2024.

Head of the Political Department of the Finnish Ministry for Foreign Affairs, wrote in guidance to Finland's first UN delegations that Finland should only support such feasible nuclear disarmament initiatives that the two leading nuclear-weapons states could also be expected to jointly support. This "Enckell Doctrine" emphasised prudence and reticence primarily aiming to avoid involvement in any negotiations or projects that could cause friction between the great powers.[261]

Under the leadership of key Foreign Ministry officials, During the negotiations for the NPT from 1965 to 1968, Finland was already recognized as an active supporter of a great-power consensus.[262] In this respect, Finland's profile differed clearly from that of, for example, Sweden, not only as regards its lower visibility but also in terms of the substance of disarmament policies. Unlike Finland, Sweden, which was maintaining a national nuclear programme that was in the research stage and which was one of the leading neutral and non-allied countries, proposed (together with Mexico), in conjunction with the negotiations leading up to the NPT, nuclear disarmament initiatives that reached considerably further than what the United States and the Soviet Union were willing to accept.[263]

Consequently, the United States and the Soviet Union invited Finland to chair the group of sponsor states advocating the signing of the NPT at the UN in 1968. The role was assigned to Finland's then UN Ambassador Max Jakobson.[264] Finland was also among the first countries to sign the NPT at the UN in June 1968. Since then, especially after the end of the Cold War and the abandonment of the neutrality policy, Finland's nuclear disarmament policy and stance on the NPT have clearly gained more obligations-oriented features emphasising the significance of great-power responsibility and, consequently, the rules-based nature of international politics. This was also visible in the grounds presented in 2016, under which Finland decided not to participate in the negotiations that led to the Treaty on the Prohibition of Nuclear Weapons (TPNW) at the UN in 2017.[265]

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261 Juntunen, 2023, pp.134–36.

262 The conclusion of the NPT also served Finland's immediate security interests. The NPT was a key condition for the resolution of the "Germanies issue", as it also ruled out any potential nuclear armament of West Germany (assuming West Germany joining the NPT), which in turn reduced Soviet opportunities to blackmail Finland diplomatically with the German military threat indicated in the Finno-Soviet Treaty of 1948 (see Jakobson, 1983, pp.140–41).

263 Jonter, 2023.

264 Jakobson 1983, pp.138–41

265 Juntunen, 2019. Unlike Finland, Sweden decided to participate in the TPNW negotiations, but it never signed the treaty, either. The only NATO member state taking part in the TPNW negotiations was the Netherlands.

Another central and historically distinct dimension of the Finnish nuclear disarmament and arms control profile arises from regional nuclear arms control initiatives. Of these, the best known is the 1963 Nordic Nuclear-Weapon-Free Zone (NNWFZ) initiative, variations of which were promoted and upheld in four waves up until 1991, and the dismantling of the bipolar system of the Cold War. Due to the NATO memberships of Denmark and Norway, the NNWFZ initiative was commonly recognised as a non-starter – regardless of their nuclear policy reservations made as NATO members in the 1950s, Denmark and Norway wanted to retain their freedom of action and the option to change their line in a potential crisis situation – and indeed the initiative largely served foreign policy purposes other than the achievement of the actual zone arrangement.[266]

During the Cold War, the key security policy motive for Finland's NNWFZ policy was seeking to distance the military presence of the great powers from Finland's neighbouring regions. This was done in a way that sought to highlight the unwanted spillover effects of the changes taking place in their nuclear policy on the stability of the Nordic region. Subsequently from the 1990s onwards, especially in the 2010s, there has been a clear shift in Finnish foreign and security policy in this respect. This has been reflected in, for example, the ways in which the military presence of NATO and the United States in the Baltic Sea region was, already before Finland's accession to NATO, described in security and defence policy reports produced by different Finnish Governments as a factor bolstering regional stability.[267]

The third key feature characterising Finland's arms control profile concerns the strong Finnish contribution to technical monitoring of nuclear materials and to other obligations under the NPT. Here, Finland has long supported the Comprehensive Nuclear-Test-Ban Treaty (CTBT) both politically and by providing key technical expertise required for the implementation of the CTBT. Also related to this is Finland's active and long tradition of cooperation relating to the development of an export control regime for nuclear material and related equipment relevant to non-proliferation of nuclear weapons in the context of the International Atomic Energy Agency (IAEA) and the Nuclear Suppliers Group (NSG) of countries exporting nuclear materials and technology.[268]

266 See Juntunen, 2024.

267 See e.g. Finnish Government, 2016, p.12, p.22; Finnish Government, 2020, p.21.

268 Paju, 2020.

Owing to its profile as a staunch supporter of the NPT (understanding the NPT pillar structure as an indivisible whole) and advocate for gradual nuclear disarmament, Finland has also been assigned some significant diplomatic responsibilities after the Cold War. Examples of these include the facilitator role in the preparation of the conference on the establishment of a Middle East zone free of weapons of mass destruction in 2011–2015, to which Finland was appointed by the UN Secretary-General and three permanent members of the UN Security Council.[269]

Even after having submitted its application to join NATO, Finland still participated as an observer in the First Meeting of States Parties to the TPNW in June 2022. In autumn 2023, however, Prime Minister Petteri Orpo's Government decided that Finland would not participate even as an observer in the Second Meeting of States Parties to the TPNW held at the turn of November–December 2023. The rationale provided for this line taken by the Government states that participation as an observer in the Meeting of States Parties to the TPNW would weaken Finland's access to influence in the Alliance and might be interpreted as dereliction of solidarity within the Alliance.[270] Also the political declaration of the First Meeting of States Parties to the TPNW held in 2022 is regarded in the rationale for the Government line as in part problematic, as the declaration equates threats of use of nuclear weapons made by Russia with NATO's nuclear deterrence and presents nuclear weapons as prohibited by international law.

Of NATO member states, Belgium, Germany and Norway did, however, participate as observers in the Meeting of States Parties to the TPNW at the turn of November–December 2023. Although the decision of Prime Minister Orpo's Government can be regarded as being in line with declared NATO policy, the line as such has not affected the decisions of the NATO member states participating as observers

269 The preparatory phase of the conference on the establishment of a Middle East nuclear-weapon-free zone coincided with the events known as the Arab Spring. Despite hundreds of informal and non-public meetings, the conference was never held. This was ultimately due to differences in standpoint between Israel and the Arab group led by Egypt (Kauhanen, 2015).

270 The reasoning can be found in a memorandum concerning additional information provided for the Foreign Ministry's current issues report on arms control of 4 October 2023 submitted to the Foreign Affairs Committee of the Finnish Parliament (in Finnish): https://www.eduskunta.fi/FI/vaski/Liiteasiakirja/Documents/EDK-2023-AK-27424.pdf. The rationale for the policy line relied on the incompatibility of the TPNW and NATO's nuclear deterrence policy and stated that "\[…] the TPNW does not promote nuclear disarmament, it is unclear in terms of provisions, and accession to the treaty would weaken Finland's security policy position." At the same time, the rationale proposes that the presented line of not participating in Meetings of States Parties to the TPNW be followed in the future, too.

in the Meetings of States Parties to the TPNW mentioned above. For example, in the July 2023 Vilnius Summit Communiqué, the Alliance reiterated its quite unambiguous critical stance to the TPNW, stating that it is incompatible with NATO's nuclear deterrence policy and risks undermining the NPT. Accordingly, NATO's official line categorically denies any impact of the TPNW on customary international law.[271]

It should be noted that Finland anchored its nuclear disarmament policy to emphasising the integrity and significance of the NPT already before joining NATO. For example, the Government Report on Finnish Foreign and Security Policy of Prime Minister Juha Sipilä's Government, which was published before the negotiations leading to the TPNW began, emphasised the key role of the NPT in promoting nuclear disarmament and, in this context, Finland's continuous contributions to the monitoring of fissile material, export control of nuclear weapons, and promotion of nuclear safety.[272]

During the preparatory phase before the negotiations on the TPNW, Finland abstained from voting in the First Committee of the UN on the mandate to take forward the TPNW process. For example Sweden, Ireland, Austria, Switzerland and the Netherlands voted for the commencement of the TPNW negotiations.[273] In the Explanation of Vote provided, however, Finland anchored its line, compliant with small-state liberal nuclear disarmament premises, strongly behind the NPT, reflecting, in this respect, also in part NATO's stand on the matter:

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271 The communiqué is available at https://www.nato.int/cps/en/natohq/official_texts_217320.htm. The critique of the TPNW provided in paragraph 54 of the communiqué reads as follows in full: "We reiterate that the Treaty on the Prohibition of Nuclear Weapons (TPNW) stands in opposition to and is inconsistent and incompatible with the Alliance's nuclear deterrence policy, is at odds with the existing non-proliferation and disarmament architecture, risks undermining the NPT, and does not take into account the current security environment. The TPNW does not change the legal obligations on our countries with respect to nuclear weapons. We do not accept any argument that the TPNW reflects or in any way contributes to the development of customary international law."

272 Finnish Government 2016, p.29.

273 Sweden also voted in favor of the TPNW at the UN in 2017 but did not at any point sign or ratify the treaty. The decision not to ratify (not made public until July 2019) was preceded by a major domestic policy dispute on Sweden's nuclear disarmament line and defence policy (see Rosengren 2022, pp.1244–47). This also involved reported US criticism of the then Swedish Government, indicating potential negative impacts on defence cooperation between Sweden and the United States should Sweden sign the TPNW (Gummesson, 2017).

> *"Finland is in favour of nuclear disarmament leading to concrete results. The participation of the nuclear powers is \[…] key to the achievement of concrete and effective nuclear disarmament. It is only in this way that all types of nuclear weapons can be reduced. This resolution will not take us there."*[274]

With regard to the primacy of the NPT, this means Finland's nuclear disarmament policy is rather smoothly aligned with NATO's policy. The same applies to the notion emphasising the importance of the involvement of the nuclear-weapon states to the gradual and pragmatic promotion of nuclear disarmament. As regards pragmatism, in recent years Finland has supported initiatives including those calling for nuclear-weapon states to reduce nuclear forces that are on high alert, for the continuation of existing reduction measures concerning strategic nuclear weapons systems, for the commencement of arms control talks concerning reductions in short-range nuclear weapons systems, for the ratification of the Comprehensive Nuclear-Test-Ban Treaty (CTBT), and for the promotion of negative security assurances provided by nuclear-weapon states to non-nuclear-weapon states. In addition, Finland has supported projects such as the Global Initiative to Combat Nuclear Terrorism (GICNT) and provided good services to promote arms control negotiations and strategic dialogue between the two leading nuclear powers.[275]

Although the rationale given for the Finnish TPNW line in autumn 2023 states that the Finnish stance on the TPNW has been consistent, there have in fact also been slight changes in the stance. While Finland still in 2016 abstained from voting on the resolution to commence negotiations, Finland has subsequently voted at the UN General Assembly against proposed resolutions clearly supporting the TPNW. As noted above, NATO membership also brought along the change that Finland no longer participated as an observer in the Meeting of States Parties to the TPNW.

These gradual changes indicate that the bridge-building policy seeking to bring the views of the various parties closer to each other, which has traditionally featured in Finland's pragmatic nuclear disarmament diplomacy, is being replaced more distinctly by principles relating to commitment to burden-sharing in the context of Alliance policy.[276] Consequently, in addition to underlining the incompatibility of the TPNW and the NPT, Finland is anticipated as a NATO member to actively support the notion whereby extended nuclear deterrence and NATO's nuclear sharing policy

274 Juntunen, 2019, p.52.

275 Juntunen, 2019, pp.54–55.

276 From the perspective of the research literature on alliance politics, it is quite typical of new members, while undergoing integration, to avoid departures from the general line of the alliance or any "freeriding" (see e.g. Ivanov, 2011, pp.190–91; see e.g. Alley, 2021, p.940).

are regarded as being in harmony with Article I and Article II of the NPT (see section 2.2 above). This aspect relating to the Alliance's politico-moral burden-sharing would undoubtedly be a new feature in Finnish nuclear disarmament and arms control diplomacy.

As regards NATO's internal preparation of arms control policy and nuclear disarmament diplomacy, it is likely that Finland is expected to maintain a relatively moderate and observant profile regarding nuclear arms control issues in the early days of its NATO membership. Following a brief learning period, however, it can be expected that Finland will integrate also into the activities of NATO's committees and advisory bodies dealing with nuclear arms control. In addition, Finland will be able to channel into NATO its long experience of policy seeking to mitigate chemical, biological, radiological and nuclear (CBRN) threats and risks, including related cooperation between military and civilian authorities and practical protection activities.

In addition, Finnish Governments and authorities will be able to raise nationally significant questions and policy initiatives in NATO. For example, Finland has recently expressed its support for the continuation of a strategic dialogue between the nuclear powers regardless of the difficult situation in world politics. At the same time it has underlined that the great powers should not increase the number of their nuclear weapons or develop new nuclear weapons systems.[277] Promoting this aim will gain new dimensions in NATO, through which Finland will have more direct access to negotiations with NATO's nuclear powers, too. Drawing attention to the risks caused by any acceleration of nuclear armament also sits well with an ethos emphasising great-power responsibility. Finland can naturally be expected to promote the above objectives also outside NATO in forums of multilateral nuclear disarmament diplomacy.

As for security in Finland's neighbouring regions, a key arms control policy topic and security challenge arises from Russia's short-range nuclear weapons systems, the number of which is estimated to be ten times larger than that of US systems. Russia has recently also announced that it will start to prepare the stationing of non-strategic nuclear weapons systems in Belarus, although it is still unclear what this will mean in practice.[278]

277 Ministry for Foreign Affairs, 2022.

278 Kristensen, Korda & Johns 2023, p.191; Lavikainen, 2023.

Both the United States and Finland have in various contexts drawn attention to the need to also include short-range nuclear weapons within the scope of arms control talks. Russia has not agreed to this, as it emphasises the significance of these weapons systems as a counterforce to NATO's combined conventional forces outnumbering Russia's. Correspondingly, Russia has for its part called for talks on missile defence systems, space weapons and precision-guided hypersonic weapons to be included in the arms control agenda between the great powers.

This is not an opportune time for new arms control initiatives proposed publicly by NATO, with Russia's war of aggression against Ukraine, failures to comply with New START, and the demise of the INF Treaty in 2019 accentuating a situation where NATO's attention focuses on strengthening deterrence. Nevertheless, it would be in the interests of Finland as well as the other NATO member states in the Nordic Countries and the Baltic Sea region to continue, in NATO's internal preparatory work, active arms control policy programming so that NATO will be ready to propose new initiatives when the situation in world politics potentially changes again. Russia's short-range nuclear weapons systems pose a threat in Finland's security environment that should be taken into account in future arms control initiatives and related negotiations, too.[279]

279 A potential foundation or first step could be provided by the proposal made by Acton, MacDonald and Vaddi (2021, pp.33–40) whereby the unilateral disarmament measures and notifications of storage of non-strategic nuclear warheads separately from delivery vehicles carried out in 1991–1992 by the United States and the Soviet Union and, subsequently, by Russia would be codified under a verifiable agreement including on-site inspections.

6 Conclusions

NATO defines itself as a nuclear alliance. Its approach to nuclear weapons has evolved as a component of the international nuclear order consisting both of practices maintaining deterrence and of treaties and measures managing nuclear risks. With the rivalry between the great powers having re-emerged, the centre of gravity of the international nuclear order has shifted from arms control towards deterrence and measures maintaining it. The arms control regime inherited from the final stages of the Cold War is currently only barely alive. The leading nuclear powers – the United States and Russia – are for the first time since 1988 in a situation where there are no verification procedures enhancing the transparency of their nuclear arsenals or practices facilitating information exchange.

With the European and international security environment declining, NATO is re-investing in its nuclear deterrence. NATO's Strategic Concept published in 2022 defines nuclear deterrence as part of NATO's deterrence mix also consisting of conventional and missile defence capabilities. Nuclear forces, in particular US strategic capabilities, are defined as the supreme guarantee of the security of the Alliance. According to the Strategic Concept, "the fundamental purpose of NATO's nuclear capability is to preserve peace, prevent coercion and deter aggression". The Strategic Concept outlines that "any employment of nuclear weapons against NATO would fundamentally alter the nature of a conflict". NATO does not see nuclear deterrence and control as mutually exclusive measures. On the contrary, arms control alongside with deterrence is defined as delivering strategic stability.

NATO's deterrence remains to be based on the most important starting assumptions of the flexible response strategy. In other words, NATO employs the threat of escalation to limit a war to the level of conventional warfare, where it plans to win the war. The strategy assumes that uncertainty about the consequences of aggression will prevent aggression against the Alliance. This in turn explains why NATO's nuclear powers and the Alliance as a whole have not ruled out the option of nuclear first use – regardless of the fact that NATO wants to maintain the highest possible threshold for nuclear employment. Instead, all of NATO's nuclear powers have provided negative security assurances, pledging not to threaten to use or to use nuclear weapons against non-nuclear-weapon states that comply with the NPT.

NATO does not have nuclear weapons of its own. Instead, its nuclear capability is based on the nuclear weapons of NATO's nuclear-weapon states, with the majority of these held by the United States. Consequently, the Alliance's nuclear deterrence is highly reliant on the entire US nuclear capability.

This means the United States is clearly the most significant one of NATO's nuclear-weapon states. The nuclear weapons of the United Kingdom and France in turn support and reinforce the nuclear deterrence of the Alliance. There are, however, differences between the countries: whereas the United Kingdom has assigned its nuclear weapons to NATO's defence, the French nuclear deterrence is intended for national use and the country is not involved in the planning or exercise activities relating to NATO's nuclear deterrence.

US nuclear weapons deployed in Europe are an essential element of NATO's nuclear deterrence policy, and the United States has had nuclear weapons in Europe since 1954. The decision made during the Cold War to deploy nuclear weapons in Ally countries created the need to commit Allies to the implementation of nuclear deterrence. Accordingly, certain Allies have provided the Alliance with access to fighter aircraft carrying US nuclear weapons. According to NATO, there are currently seven countries included in the nuclear sharing arrangement. Although the Alliance does not name the participating countries, they are commonly known. The United States has deployed its B61 nuclear bombs in Belgium, Germany, Italy, the Netherlands and Turkey. These countries also have the capability to carry US bombs. Greece also appears to have capability to carry out nuclear missions. The seventh Ally included in the arrangements is the United States, which has nuclear-capable fighters deployed in Europe.

Despite the radical change in the security policy environment and the reforms currently underway in NATO's deterrence and defence policy, the Alliance has not made any major changes to its overall nuclear deterrence policy and posture. As far as is known, the United States has not increased the number of its non-strategic nuclear weapons in Europe, and no new countries have yet been included in nuclear sharing arrangements. That said, the Alliance is engaged in a noteworthy modernisation of its nuclear sharing efforts, taking place within the existing policy parameters, however. According to various estimates, the United States has deployed 100–200 B61 bombs in Europe, with a modernised version of these (B61-12) currently being phased in. The number of US nuclear weapons in Europe is small compared with the peak years of the Cold War when the United States had more than 7,000 nuclear weapons and several different weapons systems deployed in Europe. The current modernisation of the B61 and the development of NATO's nuclear infrastructure are indications of NATO developing its nuclear deterrence. Certain

NATO countries would also be willing to change NATO's nuclear policy practices by means of developments including the expansion of the nuclear sharing arrangements.

In recent years, NATO has sought to expand the participation of Allies to the various components of nuclear deterrence policy. The Alliance aims for its members to not only benefit from the nuclear deterrence of NATO's nuclear-weapon states but also to contribute in their own limited way to the credibility of deterrence. NATO members have a whole host of opportunities to participate in operational activities relating to the implementation of NATO's nuclear deterrence policy by means of conventional armed forces or in the political domain. Through the Conventional Support for Nuclear Operations (CSNO) mechanism, Allies not included in nuclear sharing arrangements can provide capabilities for use in NATO's nuclear operations. This may involve exchange of intelligence information, cyber and electronic warfare capabilities, anti-aircraft systems and long-range capabilities or perhaps provision of medical care services. Alongside the military domain, Allies may support NATO's nuclear deterrence policy in the political domain, too. Some Allies have, for example, provided their airspace for NATO's nuclear exercise, Steadfast Noon.

The Alliance has a specific high-level body on nuclear matters: the Nuclear Planning Group (NPG), which makes decisions on the implementation of the policies agreed and discusses policy issues associated with NATO's nuclear policy. Although the North Atlantic Council is NATO's highest decision-making authority, the NPG acts as the senior body on nuclear matters – there is no longer a corresponding body for other policy areas. The work of the NPG is supported by the HLG and by the NPG Staff Group composed of national delegations of member countries and chaired by the Director of Nuclear Policy. Alongside official decision-making bodies, the Alliance has several informal groups of varying compositions discussing nuclear policy. The Allies also consult each other on issues relating to NATO's nuclear deterrence.

There are major differences between the stances of NATO Allies on nuclear deterrence and their contributions to the nuclear policy of the Alliance. Member states of the Alliance cannot be classified explicitly into tribes or groups, either, even though some groups of countries do stand out. One of these groups is NATO's nuclear-weapon states: the United States, the United Kingdom and France, which engage in continuous consultations with each other on the Alliance's nuclear policy. The nuclear-weapon states naturally have the greatest power of influence in matters relating to NATO's nuclear deterrence, even though the Allies are formally equal in status. Another group is the DCA countries, that is, the countries included in NATO's nuclear sharing arrangements. Of the Nordic countries, Norway and

Denmark have had a unique stance on nuclear weapons. Largely for domestic policy reasons, they have imposed their independent restrictions on hosting nuclear weapons on their territory. On the other hand, the two countries have at least at some point of their membership been involved in support measures for nuclear operations.

As a member of NATO, Finland has the opportunity to participate in NATO's decision-making and policymaking concerning nuclear deterrence policy. Finland has participated in its first NPG meeting, and Finnish officials are involved in working groups preparing nuclear policy. If it wishes, Finland also has the opportunity to participate in operational activities supporting NATO's nuclear deterrence. NATO's nuclear deterrence policy opens up a new political playing field for Finland that provides it with several different options as regards the level of ambition and activity involved in its participation. The most important short-term objective is, however, to do with strengthening Finnish nuclear competence.

As regards nuclear arms control, Finland's priorities will most likely be built on three tracks. These are Finland's staunch support for the NPT and the regulatory regime built around it, an emphasis on timely arms control initiatives as a counterweight to a policy aiming to strengthen NATO's nuclear deterrence, and upholding arms control questions in accordance with Finland's immediate security interests in NATO's internal discussions. Therefore NATO membership does not mean giving up measures promoting arms control. On the contrary, arms control is one of the areas where Finland is expected to be an active Ally.

Abbreviations

Abbreviation	Definition
AAC	Allied Air Commander
ABM	Anti-Ballistic Missile Treaty
AFGSC	The Air Force Global Strike Command
AI	Artificial Intelligence
ALCM	Air-launched cruise missile
BCC	Biltateral Consultative Commission
BIC	Bilateral Implementation Commission
CBRN	Chemical, biological, radiological, and nuclear
CDRUSEUCOM	Commander of the US European Command
CDRUSSTRATCOM	Commander of the US Strategic Command
CMX	Crisis Management Exercise
CSNO	Conventional Support for Nuclear Operations
CTBT	Comprehensive Nuclear-Test-Ban Treaty
DCA	Dual-capable Aircraft
DDPR	NATO Defence and Deterrence Posture Review
eFP	enhanced Forward Presence
FIIA	Finnish Institute of International Affairs
FLF	Forward Land Forces
GICNT	Global Initiative to Combat Nuclear Terrorism
HLG	High Level Group
HOB	Height of burst
IAEA	International Atomic Energy Agency
ICMB	Intercontinental ballistic missile
INF	Intermediate-Range Nuclear Forces Treaty
JSCP	Joint Strategic Capabilities Plan
LRSO	Long Range Stand Off Weapon

Abbreviation	Definition
MLF	Multilateral Force
MTCR	Missile Technology Control Regime
NAC	New Agenda Coalition
NATO	North Atlantic Treaty Organisation
NDAC	Nuclear Defence Affairs Committee
NNWFZ	Nordic Nuclear-Weapon-Free Zone
NPG	Nuclear Planning Group
NPR	Nuclear Posture Review
NPT	Treaty on the Non-Proliferation of Nuclear Weapons
NSG	Nuclear Suppliers Group
NWFZ	Nuclear-weapon-free zone
P5	Permanent Five (members of the UN Security Council)
OPCON	Operational command
QRA	Quick Reaction Alert
SALT	Strategic Arms Limitation Talks
SACEUR	Supreme Allied Commander Europe
SHAPE	Supreme Headquarters Allied Powers Europe
SIOP	Single Integrated Operational Plan
SLBM	Submarine-launced ballistic missile
SNOWCAT	Support of Nuclear Operations with Conventional Air Tactics
SPC	Strategic Posture Commission
SSBN	Ballistic missile submarine
SORT	Strategic Offensive Reductions Treaty
START	Strategic Arms Reduction Treaty
TPNW	Treaty on the Prohibition of Nuclear Weapons
UN	United Nations
US	United States
USAFE	United States Air Force in Europe
USSTRATCOM	United States Strategic Command
WS3	Weapons Storage and Security Systems

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