

**NUCLEAR WEAPONS IN A NEW
GEOPOLITICAL REALITY**

AN URGENT NEED FOR NEW ARMS CONTROL INITIATIVES

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Members of the Advisory Council on International Affairs

Chair	Professor Jaap de Hoop Scheffer
Vice-chair	Professor Joris Voorhoeve
Members	Professor Tineke Cleiren Professor Joyeeta Gupta Professor Ernst Hirsch Ballin Professor Luuk van Middelaar Professor Mirjam van Reisen Monika Sie Dhian Ho Lieutenant-General (ret.) Marcel Urlings
Executive Secretary	Marja Kwast-van Duursen

P.O. Box 20061
2500 EB The Hague
The Netherlands
telephone + 31 70 348 5108/6060
e-mail aiv@minbuza.nl
www.aiv-advice.nl

Members of the Peace and Security Committee

Chair	Professor Joris Voorhoeve
Vice-chair	Lieutenant-General (ret.) Marcel Urlings
Members	Professor Edwin Bakker Dirk Barth Arend Jan Boekestijn Lo Casteleijn Professor Ko Colijn Dr Nikolaos van Dam Dr Nienke de Deugd Dr Margriet Drent Professor Isabelle Duyvesteyn Pieter Feith Dr Rem Korteweg Lieutenant-General (ret.) Dirk Starink
Executive secretary	Jan Willem Glashouwer

Contents

Foreword

I	Nuclear weapons back in the spotlight	9
	I.1 A new geopolitical reality	9
	I.2 Increased potential for conflict	11
	I.3 A world without nuclear weapons?	17
II	International legal framework, ethics and nuclear weapons	22
	II.1 Ethical principles and international law	22
	II.2 International law and possession of nuclear weapons	22
	II.3 International law and the threat or use of nuclear weapons	23
	II.4 Ethics and nuclear weapons	27
III	Changes in the nuclear security context	30
	III.1 The Russian and Chinese modernisation programmes	30
	III.2 The US modernisation programme	36
	III.3 ‘Entanglement’ of nuclear and non-nuclear capabilities and technologies	40
IV	Nuclear arms control under pressure	45
	IV.1 Importance of nuclear arms control	45
	IV.2 Obstacles and uncertainties	46
	IV.3 A changing international setting	53
V	NATO policy	56
	V.1 NATO’s nuclear policy	56
	V.2 Credible deterrence	57
	V.3 Division of nuclear roles and tasks	60
VI	Conclusions and recommendations	64
	VI.1 Conclusions	64
	VI.2 Recommendations	73
Annexe I	Request for advice	
Annexe II	Historical overview of nuclear deterrence and nuclear arms control	
Annexe III	Advisory Opinion of the International Court of Justice	
Annexe IV	Modernisation of strategic triads	
Annexe V	European nuclear deterrence	
Annexe VI	Terms and abbreviations	
Annexe VII	List of persons consulted	

Foreword

Notes on the request for advice

The government asked the Advisory Council on International Affairs (AIV) to conduct a thorough analysis of the current and future role of nuclear weapons (request for advice of 15 March 2018, see Annexe I). In its request, the government observed that geopolitical and technological changes and changes in nuclear doctrine in particular impel us to rethink NATO's current nuclear policy and the Netherlands' role as a member of the Alliance. First and foremost, the analysis would concern the NATO nuclear security context, including specific developments in Russia and other countries such as North Korea and Iran. The government also asked the AIV to assess whether NATO policy is equal to these challenges, in terms of both the required deterrence capabilities and nuclear arms control and risk reduction. Lastly, the government's request emphasised the division of nuclear roles and tasks within NATO, partly in relation to the wider issue of transatlantic burden-sharing. It asked the AIV to focus on the role of the three nuclear powers within NATO (the United States, France and the United Kingdom), the American sub-strategic nuclear weapons in Europe and the Netherlands' nuclear task.

Background

The advisory report goes further than merely providing commentary and making recommendations on current and anticipated nuclear developments within NATO. In its request for advice, the government observed that nuclear expertise and knowledge of nuclear issues have declined since the end of the Cold War. For that reason the AIV wants its advisory report to contribute to a deeper insight into this wide-ranging field, which can be difficult to get to grips with. A historic overview beginning in 1945 has been included as an annexe to the report. In addition to the subjects on which the government requested advice, the advisory report also deals with matters such as international law and ethics, and the basis for nuclear arms control. The authors of this report consulted not only security experts from within the AIV and elsewhere but also legal professionals, academics and representatives of civil society organisations. See Annexe VII for the list of persons consulted.

Terminology

In the interests of clarity, a list of terms and definitions has been included as Annexe VI to the advisory report. The oft-made distinction between 'strategic' and 'tactical' nuclear weapons is not based on authoritative definitions. The term 'tactical' was also used for nuclear battlefield weapons. These weapons, such as nuclear artillery with its short range and often relatively limited explosive power, have been fully banned by NATO. In the AIV's view, the use of any nuclear weapon, regardless of its characteristics, fundamentally changes the nature of a conflict and therefore always has a strategic significance. For the nuclear weapons that are not viewed as belonging among the strategic nuclear weapons to which the United States and Russia have attached treaty limitations, the AIV considers 'sub-strategic' to be the least problematic term.

Structure of the report

Chapter I deals with the developments that have brought nuclear-weapon-related issues to the fore once again. Besides the tensions between the major

nuclear powers and the new focal points of US security policy, these include the mounting concerns, especially in non-nuclear-weapon states, about the lack of progress towards achieving nuclear non-proliferation and a reduction of the role of nuclear weapons.

Chapter II is devoted to a consideration of the international legal framework and the ethical principles applicable to nuclear weapons. Annexe III contains a commentary on the 1996 Advisory Opinion of the International Court of Justice.

Chapter III provides an analysis of the latest developments in the context of nuclear security. As such, it deals in particular with the nuclear modernisation programmes of the United States, Russia and China, which are bound to leave their imprint. The chapter considers the new capabilities and planned capabilities on a country-by-country basis (see also Annexe IV), as well as the role played by nuclear weapons in strategy and the changes in doctrine. The increased strategic rivalry between the three major nuclear powers is also evident in the field of non-nuclear capabilities and technologies. The report identifies the new risks that this rivalry entails. Other factors, such as the dissemination of nuclear knowledge and material for peaceful applications and the threat of nuclear terrorism, lie outside the scope of this report.

Chapter IV takes stock of what is at stake in nuclear arms control and disarmament, given the evolving dynamics between the major powers, including the nuclear powers. In view of various issues, including the current crisis surrounding the Intermediate-range Nuclear Forces treaty (INF Treaty), it is debatable whether the foundations of the system are still strong enough. The chapter does not purport to provide a complete overview of all the efforts being made in this context, and the AIV has no wish to detract in any way from what the government is doing at multilateral level (letter to the House of Representatives of 21 June 2018). Nonetheless, the AIV considers it important to focus on areas requiring extra attention, both generally and within NATO, in view of the uncertain future of the nuclear arms control regime.

Chapter V focuses on the implications for NATO policy, its deterrence policy and the importance of the arrangements between the Allies in the context of nuclear sharing, including the nuclear task performed by the Netherlands. An issue that arises in connection with the division of nuclear roles and tasks within NATO is whether or not it is desirable to have a European nuclear deterrent (see also Annexe V).

Finally, Chapter VI contains the conclusions and recommendations.

The report was prepared by the AIV's Peace and Security Committee (CVV), consisting of Professor J.J.C. Voorhoeve (chair), Lieutenant General (ret.) M.L.M. Urlings (vice-chair), Professor E. Bakker, D.J. Barth, A.J. Boekstijn, L.F.F. Casteleijn, Professor J. Colijn, Dr N. van Dam, Dr N. de Deugd, Dr M. Drent, Professor I. Duyvesteyn, P.C. Feith, Dr A.R. Korteweg and Lieutenant General (ret.) Dr D. Starink. The executive secretary was J.W.K. Glashouwer, assisted by Ms R.M. Guldmond, Ms F.A. den Hollander and Ms A.A. Stoetman (trainees). The civil service liaison officers were P. van Donkersgoed and H.J.R. Slettenhaar, both of

the Ministry of Foreign Affairs, and H.J.A.M. van Oosterhout of the Ministry of Defence.

In preparing this report the Committee consulted a large number of experts. The AIV is very grateful to them for their assistance.

The AIV adopted the advisory report on 29 January 2019.

I Nuclear weapons back in the spotlight

I.1 A new geopolitical reality

The AIV considers knowledge of the history of nuclear deterrence and nuclear arms control indispensable for understanding current developments in this field and viewing them in perspective. The role that nuclear weapons have played – and continue to play – in the global and European balance of power has long been neglected. As a historical refresher, Annexe II to this advisory report therefore contains a fairly detailed overview of the nuclear issues since 1945.

Nuclear weapons issues are back in the spotlight. The current crisis surrounding the treaty banning ground-launched, intermediate-range ballistic missiles and cruise missiles (the Intermediate-Range Nuclear Forces (INF) Treaty) is a case in point. On 22 October 2018 the US national security adviser, John Bolton, confirmed in Moscow that the United States was intending, as previously stated by President Trump, to withdraw from the INF Treaty. The moment of formal withdrawal now seems close at hand.¹ The United States considers the situation no longer tenable as Russia has been violating its obligations under the INF Treaty with impunity for years and China and other countries – which are not parties to the treaty – are developing shorter-range and intermediate-range missiles unhindered.² In reply, President Putin pointed out that it was once again the United States, just as in 2002, that was unilaterally withdrawing from an important arms control treaty dating from the Cold War era.³ He emphasised the harmful implications for the extension after 2021 of the New START Treaty, which would be the sole remaining nuclear arms agreement between the United States and Russia after the termination of the INF Treaty. He thought a new arms race was probable and also threatened that European countries that permitted the stationing of new US nuclear missiles would expose themselves to a possible retaliatory strike.⁴

1 The United States has stated that it will formally announce the beginning of the withdrawal procedure on 2 February 2019. *The Guardian*, 16 January 2019, see: <<https://www.theguardian.com/world/2019/jan/16/us-russia-inf-treaty-nuclear-missile>>.

2 See: <<https://www.theguardian.com/world/2018/oct/23/bolton-inf-treaty-russia-putin-moscow-meeting>>. The 1987 INF Treaty bans the development and stationing of all ground-launched cruise and ballistic missiles with a range of 500 to 5,500 kilometres. The parties to the INF Treaty are the United States and the republics of the former Soviet Union which possessed nuclear weapons during the Cold War (i.e. not only Russia but also Ukraine, Belarus and Kazakhstan).

3 This was a reference to the Anti-Ballistic Missile Treaty (ABM Treaty) dating from 1972. The unilateral US denunciation took effect upon the expiry of a six-month period of notice on 13 June 2002. The decision cleared the way for the further development and deployment of ballistic missile defence systems, which was considered necessary in view of the increased threat of terrorism and rogue states.

4 See: <<https://www.bbc.com/news/world-europe-45971537>> and <<https://www.reuters.com/article/us-usa-nuclear-putin/russia-will-target-european-countries-if-they-host-u-s-nuclear-missiles-putin-idUSKCN1MY2FO>>.

It is easy to point the finger at the United States, although it has now admittedly given cause to do so. However, the shaky position of the INF Treaty – or, as some analysts say, of the entire international nuclear arms control regime – is also closely bound up with the conduct of the other nuclear-weapon states. Unlike the situation during the Cold War, when there were two ideologically driven power blocks that viewed each other as an existential threat, the international order has become much more diffuse. The total number of states that have nuclear weapons is nine, but this number may well increase in the future. The scope for exerting power and influence indirectly, in ways that are sometimes hard to trace, has increased sharply. In a multipolar world, states that are in competition and dispute with one another in one area may cooperate closely together in other areas, in ever-shifting coalitions. However, the deterrence concepts and nuclear arms control are still based on principles that stem from the Cold War.

It is not yet certain whether the days of the INF Treaty are definitely numbered. After all, it is still possible – albeit not very likely – that Russia will decide at some point in the next six months to comply with the urgent appeal from the United States and the other NATO countries to return to full and verifiable compliance.⁵ Hitherto, however, there have been no serious overtures or conciliatory moves. President Putin's announcement in mid-December 2018 that Russia had begun serial production of a nuclear-capable hypersonic glide vehicle that cannot be intercepted by even the most advanced missile defence system is hardly a hopeful sign.⁶ If the American withdrawal unfortunately proves to be irreversible, it is impossible to predict exactly how this will affect relations with Russia and nuclear arms control in a broader sense. However, it is already apparent from the present situation that the international context has changed fundamentally since the time of the unilateral denunciation by the United States of the ABM Treaty in 2002. The crisis surrounding the INF Treaty did not arise overnight and is in some ways a reflection of the changed balance of power, the increased potential for conflict between the major powers and pressure on the norms and institutions that should have a moderating effect.⁷

One of the main issues as early as the beginning of the 1990s was how to prevent high-risk countries and terrorist organisations from obtaining access to weapons of mass destruction and advanced means of delivery. It was unclear what role nuclear deterrence could still play. In an increasingly interconnected world, transnational proliferation networks had proved capable of evading international supervision. The terrorist attacks of 11 September 2001 were a turning point, forcing the United States to address these issues as a matter of urgency. Since it was no longer convinced that its adversaries would always be deterred by its military superiority, the United States decided to further develop and deploy ballistic missile defence systems. Its withdrawal from the ABM Treaty made this possible. At the time, the AIV described the further spread of missile technology as disquieting, but also concluded that missile defence could offer only

5 Article XV of the INF Treaty provides that withdrawal takes effect six months after formal notice of withdrawal. For the text of the treaty, see: <<https://www.state.gov/t/avc/trty/102360.htm>>.

6 See, for example, *Reuters*, 26 December 2018: 'Putin says Russia is ready to deploy new hypersonic nuclear missile'.

7 Nina Tannenwald, 'The vanishing nuclear taboo? How disarmament fell apart', *Foreign Affairs*, November/December 2018 issue. See: <<https://www.foreignaffairs.com/articles/world/2018-10-15/vanishing-nuclear-taboo>>.

limited protection and that further strengthening of the non-proliferation regime and arms control was necessary. It noted that the withdrawal of the United States from the ABM Treaty did not mean that the doctrine of mutual assured destruction no longer applied between the United States and Russia, as strategic parity would long remain the basic *de facto* criterion in relations between the two former rivals. According to the AIV, however, the further development of missile defence systems could eventually have a destabilising effect, both generally and in relation to China.⁸

Once again, it has become relevant to ask whether agreements and principles dating from the Cold War era for ensuring strategic stability and preventing arms races are still fit for purpose. A new geopolitical reality has to be taken into account in answering this question. Russia's changed conduct, the rise of China as a major military power and the possible breakthroughs in various new (non-nuclear) areas of technology can change the strategic balance of power and increase feelings of insecurity. Countries such as North Korea and Iran have obtained ballistic missiles that can be equipped with weapons of mass destruction, which North Korea actually possesses. In recent decades, the case of North Korea has shown that, when a country is bent on developing nuclear weapons, preventing them from doing so is very difficult, even if the means available to the country concerned seem limited.

1.2 Increased potential for conflict

Deterioration in relations with Russia

Relations between the NATO countries and Russia have fundamentally worsened in the past decade.⁹ Attempts by the United States under former presidents Bush and Obama to put relations on a different footing went unanswered by Russia, which aspires to the status of global power, regards further NATO expansion as a threat and wants more influence in the 'near abroad'.¹⁰ Following Russia's annexation of Crimea and its military interference in the eastern part of Ukraine since 2014, the United States responded by imposing economic sanctions and, within NATO, bolstering the deterrence and defence posture to head off Russian aggression. The conclusion of US intelligence and security services that the Kremlin tried to influence the 2016 US presidential elections¹¹ was followed in 2017 by additional sanctions and (reciprocal) expulsions of diplomats. Washington has announced that it will continue to expand the list of sanctioned export goods because it has serious grounds for believing that the Kremlin was also involved in the poisoning of former Russian spy Sergei Skripal and his daughter in the United Kingdom.¹²

8 AIV advisory report no. 28, 'An Analysis of the US Missile Defence Plans. Pros and Cons of Striving for Invulnerability', 17 July 2002.

9 President Putin announced during the Munich Security Conference in 2007 that Russia would resume air patrols with nuclear-capable, long-range bombers. This landmark speech is often said to mark the moment when Russia's conduct changed and it began openly seeking major power status in terms of both foreign policy and military capability.

10 AIV advisory letter no. 31, 'Russia and the Defence Efforts of the Netherlands', March 2017.

11 See: <<https://www.nytimes.com/2017/01/06/us/politics/russia-hack-report.html>>.

12 See: <<https://www.ft.com/content/0d1d64dc-9b41-11e8-ab77-f854c65a4465>>.

Russia and the United States currently define their bilateral relationship mainly in terms of geopolitical rivalry, with coercion strategies being used more obviously than before to limit an adversary's freedom of manoeuvre. The strategic and sub-strategic nuclear weapons that both countries possess – together with conventional and relatively new unconventional (cyber) weapons – still form the ultimate deterrent. As tensions continue to rise, it is no longer inconceivable that the two major nuclear powers could become embroiled in a military conflict, for example as a result of real or perceived provocations along the borders of NATO territory. Difficult communication between the parties increases the risk of accidents, misconceptions and unintended escalation, with potentially uncontrollable consequences. Against this background, elements of the extensive military and nuclear modernisation programmes of the two countries give cause for concern, particularly in view of developments and changes in doctrine and military technology that are potentially destabilising and may be the prelude to a new nuclear arms race and further proliferation.¹³

Strategic rivalry with China

The United States is entangled in a rivalry with China, which it increasingly views as a threat to US commercial and security interests in Asia and the Western Pacific. In 2013 China unilaterally announced, virtually unhindered, an air defence identification zone under its control in the East China Sea. Later, it succeeded in bringing almost the entire disputed area in the South China Sea under its control, building infrastructure and militarising its presence. One of the reasons why it was possible for this stealthy development to occur was that the United States and its allies were reluctant to escalate at the expense of trade and cooperation in other areas. Once the new situation had become a reality, the adverse award made by the Permanent Court of Arbitration in The Hague was not seen by China as a reason for changing course. Just three years ago, President Xi Jinping promised President Obama in the Rose Garden in Washington not to militarise the artificial islands in the South China Sea.¹⁴ The opposite happened. During the visit by US Secretary of Defence James N. Mattis to Beijing in June 2018, President Xi Jinping warned that China would not give up so much as 'one inch' of the area it claimed.¹⁵

The fear is that China believes that, in the absence of resistance, more should be possible. Under the guise of economic development and trade promotion, it has established strategic positions in Africa, Europe and parts of South Asia and in Latin America. China has also applied debt trap diplomacy to gain a firm foothold in economically vulnerable countries that are of military and strategic importance. The United States is taking protective measures against what its allies perceive as unwanted Chinese interference in the Indo-Pacific region. This includes an increase in the frequency of the freedom of navigation patrols carried out in the South China Sea since 2015. The purpose of these maritime patrols is to prevent China from having *de facto* control over free passage on the grounds of a self-declared security interest and thereby

13 James N. Miller Jr. and Richard Fontaine, 'A New Era in U.S.-Russian Strategic Stability. How Changing Geopolitics and Emerging Technologies are Reshaping Pathways to Crisis and Conflict', September 2017.

14 See: <<https://www.reuters.com/article/us-usa-china-pacific/xi-denies-china-turning-artificial-islands-into-military-bases-idUSKCNORP1ZH20150925>>.

15 See: <<https://www.scmp.com/news/china/diplomacy-defence/article/2152792/china-wont-concede-inch-xi-jinping-tells-us-defence>>.

refusing to tolerate the military presence of other countries.

While China was not a factor of importance in nuclear terms during the Cold War, and its nuclear potential remains much smaller than that of the United States and Russia, it now possesses an impressive arsenal of missiles. Its high speed ballistic missiles are designed to eliminate ships and land-based targets. The latest versions, the DF-21D and the DF-26, are capable of disabling the largest US warships, including aircraft carriers, even at a considerable distance from China ('carrier killers'). Indeed, the DF-26 can threaten shipping near Guam. China has short-range missiles, cruise missiles, intermediate-range, long-range and intercontinental missiles that can be launched from land, sea and air and carry nuclear payloads. A large proportion of the ballistic missiles and cruise missiles have a range of between 500 and 5,500 kilometres. Carrier strike groups are a very costly and increasingly vulnerable way for the United States to project power in remote maritime areas. In the event of an armed clash with China, it would be increasingly difficult for the US to penetrate the Anti-Access/Area Denial (A2/AD) systems on the Chinese mainland and support facilities in the South China Sea. Deployment of (relatively inexpensive) land-based systems, for example on Guam and in Japan, South Korea or northern Australia, is subject to the restrictive provisions of the INF Treaty.

China's aim is not primarily to have the military capability to defeat the United States in the event of a conflict, but rather to make it too costly for it to consider military intervention. In a recent assessment commissioned by Congress, US security experts pointed out that, despite the United States' unrivalled military power, its limits would soon become apparent in the event of a major conflict with Russia or China: 'In the event of large-scale conflict with Russia or China, the United States may not have sufficient remaining resources to deter other adversaries in one – let alone two – other theaters by denying them the ability to accomplish their objectives without relying on nuclear weapons. The Department's suggested means for addressing multiple contingencies – minimizing involvement in the Middle East, deepening collaboration with allies and partners, and increasing the salience of nuclear weapons – are unlikely to solve the problem.'¹⁶

New focal points of US security policy

The United States has now stressed the need, more explicitly than before, for a differentiated deterrence strategy to deal with a range of adversaries in a more competitive global context.¹⁷ According to a quote on the White House website, strengthening deterrence actually has the highest priority: 'Rebuilding U.S. deterrence to preserve peace through strength must be our Nation's top priority.'¹⁸ While European countries still (or once again) view Russia as the state posing potentially the greatest threat, the United States is increasingly focusing on China, North Korea and Iran as well. Although the threat from its nuclear weapons arsenal is still of a different order of magnitude, China's economic growth has undeniably been accompanied by an expansion

16 National Defense Strategy Commission, 'Providing for the Common Defense. The Assessment and Recommendations of the National Defense Strategy Commission', 13 November 2018, p. 20.
See: <<https://www.usip.org/publications/2018/11/providing-common-defense>>.

17 *National Defense Strategy* (January 2018) and *Nuclear Posture Review* (February 2018) of the United States.

18 See: <<https://www.whitehouse.gov/issues/national-security-defense/>>.

of strategic options for exerting influence. China is steadily building up an advanced military capability, including a complete triad of strategic nuclear weapons. As far as North Korea and Iran are concerned, the United States wishes to ramp up pressure on these countries to distance themselves once and for all from developing their own nuclear weapon capability and ballistic missiles. This may well be already too late in the case of North Korea. Against this background, the US administration recently presented a range of research and other plans for strengthening its defence against 'rogue state and regional missile threats'.¹⁹ The 2018 Nuclear Posture Review (NPR) announced new measures in the nuclear weapons field that raise classic questions about the credibility of the deterrence, about the precautionary measures to be taken if the deterrence should fail and about the possibility or impossibility of nuclear conflict management and escalation dominance (see Chapters III and V). Just as in the Cold War era, these questions concern the very foundations of the North Atlantic security framework.²⁰

Tensions around North Korea's nuclear weapons programme

Despite many attempts by the international community to prevent North Korea from continuing its nuclear weapons programme, under Kim Jong-un it is clearly doing everything it can to be recognised as a new nuclear-weapon state. Arguably, North Korea has actually succeeded in this, not only in *de facto* terms (it may already have managed to stockpile some 10-20 nuclear weapons),²¹ but also because of the decision by the United States for the first time in history to engage directly in talks at presidential level on normalising relations and 'denuclearising' the Korean peninsula.²² The run-up to the historic meeting between the leaders of the two countries on 12 June 2018 (the Singapore Summit) was a turbulent period. A series of North Korean missile tests and a major nuclear weapons test in 2017,²³ followed by some harsh nuclear-tinged rhetoric from both President Trump and Kim Jong-un, created a sense of crisis that was still apparent around the turn of the year. This was because analysts had concluded from the latest missile tests that for the first time North Korea should be deemed capable of reaching parts of US territory with an intercontinental missile. The rapprochement between North and South Korea during the Olympic Winter Games created an opening for negotiations with Washington, but the talks did not take place until after President Trump had dismissed Secretary of State Rex Tillerson in March, apparently in part because of disagreements about the approach to be adopted towards North Korea and possibly also Iran.²⁴

19 *Missile Defense Review* (January 2019) of the United States, p. III.

20 By way of illustration, see: Forrest E. Morgan, 'Dancing with the Bear. Managing Escalation in a Conflict with Russia', *Proliferation Papers*, No. 40, Winter 2012; Michael Fitzsimmons, 'The False Allure of Escalation Dominance', *War on the Rocks*, 16 November 2017; Ulrich Kühn, 'Preventing Escalation in the Baltics. A NATO Playbook', 2018 Carnegie Endowment for International Peace; Peter Rudolf, 'Aporien Atomarer Abschreckung. Zur US-Nukleardoktrin und ihren Problemen', *SWP-Studie* 15, July 2018.

21 Hans M. Kristensen and Robert S. Norris, 'North Korean Nuclear Capabilities, 2018', *Bulletin of the Atomic Scientists*, 74:1, 41-51, 8 January 2018, <<https://doi.org/10.1080/00963402.2017.1413062>>.

22 See: <<https://www.csis.org/analysis/assessment-singapore-summit>>.

23 See: <<https://edition.cnn.com/2018/03/06/asia/north-korea-missile-tests-2017-intl/index.html>>.

24 <<https://edition.cnn.com/2018/03/13/politics/rex-tillerson-secretary-of-state/index.html>>.

The initial optimism about the measures to be taken after the Singapore Summit²⁵ has now faded. North Korea has stipulated that any follow-up steps should depend on the extent to which the United States shows goodwill by lifting sanctions. The United States remains determined to maintain the sanctions regime and demand strict compliance by Russia and China²⁶ as long as North Korea does not actually relinquish its nuclear weapons. Nine days after the summit, the US president extended the economic sanctions and described North Korea as an 'ongoing and extraordinary threat' to the United States. Doubts about whether North Korea really intends to give up its nuclear ambitions seem to be confirmed by the International Atomic Energy Agency (IAEA), which says it has found no indication that North Korea has halted its nuclear weapons programme and has expressed grave concern about this.²⁷

The United States has stressed that it is considering all options for preventing parts of its territory from coming within nuclear range of North Korea, leaving Washington vulnerable to nuclear blackmail. North Korea regards strategic nuclear weapons as the ultimate security guarantee against an attack by the United States and its allies in the region, which it believes are out to destroy the regime. Although there is as yet no evidence that North Korea already possesses or has deployed intercontinental ballistic missiles (ICBMs), it is reasonable to assume from the nuclear weapons tests and missile launches of recent years that it is developing this capability as a matter of priority. Once North Korea has mastered the last technological steps, this would pose a real threat in the not too distant future.²⁸ According to NATO, Europe too would then come within range of North Korean long-range nuclear missiles.²⁹

If North Korea continues with its nuclear weapons programme despite the sanctions and diplomatic initiatives, the question arises as to whether the United States would disable the North Korean test sites, command centres and missile installations, if necessary by military means. Although the new national security strategy of the United States seems to provide for such a scenario ('ability to defeat missile threats prior to launch'), analysts point out that a targeted attack would still entail major risks.³⁰ Besides the possible consequences of a conventional retaliatory attack with massive artillery bombardments of South Korean cities, some analysts point out that Pyongyang may have biological and

25 See: <<https://edition.cnn.com/2018/06/22/asia/us-south-korea-exercises-suspended-intl/index.html>> and <<https://nos.nl/artikel/2242937-noord-korea-begint-met-ontmanteling-test-en-lanceercentrum.html>>.

26 See: <<https://www.reuters.com/article/us-usa-trump-exclusive/exclusive-trump-accuses-russia-of-helping-north-korea-evade-sanctions-says-u-s-needs-more-missile-defense-idUSKBN1F62KO>>.

27 See: <<https://www.reuters.com/article/us-northkorea-usa-iaea/no-indication-north-korean-nuclear-activities-stopped-iaea-idUSKCN1L61HB>>.

28 Edward Luttwak, 'It's time to bomb North Korea', *Foreign Policy*, 8 January 2018.

29 Letter to the House of Representatives reporting on the meeting of NATO Ministers of Defence on 8 and 9 November 2017.

30 See: <<https://www.bloomberg.com/news/articles/2018-01-02/trump-s-strategy-to-knock-out-north-korean-missiles-carries-risk>> and <https://www.defensenews.com/congress/2018/01/18/us-lawmakers-bloody-nose-strike-would-spark-massive-war/?utm_source=Sailthru&utm_medium=email&utm_campaign=ebb%2001.19.2018&utm_term=Editorial%20-%20Early%20Bird%20Brief>.

chemical weapons.³¹ Moreover, bearing in mind the debate about the legitimacy of the military intervention in Iraq in 2003, major doubts must exist about the legitimacy of a pre-emptive strike if it cannot be conclusively shown that an adversary is about to launch a devastating attack. In such cases, this would actually amount to a preventive strike to neutralise a threat that may manifest itself over time, for which there is no basis in international law. This might encourage other states to start preventive wars, or it might make them even more determined to acquire weapons of mass destruction, with all the destabilising consequences that this would have.³²

Future of comprehensive agreement with Iran uncertain

Since 2002 it had been assumed that Iran was pursuing its nuclear programme partly with a view to developing nuclear weapons, but it has now substantially reduced its nuclear activities and placed them under supervision as part of the Joint Comprehensive Plan of Action (JCPOA) agreed in 2015.³³ Under the JCPOA, Iran has agreed, in exchange for the phased lifting of the sanctions imposed by the United States and the EU, to drastically reduce its centrifuge capacity for uranium enrichment and its uranium stockpiles, to end weapons-grade plutonium output and to submit to verification to ensure that it is meeting its non-proliferation obligations under the Non-Proliferation Treaty (NPT) and the Subsidiary Arrangements to the Safeguards Agreement.³⁴ This means that for 10 years Iran will always be at least one year away from being able to produce enough enriched uranium for a nuclear weapon, should Tehran decide to no longer adhere to the JCPOA. According to the IAEA, Iran is in compliance.³⁵

After the unilateral withdrawal by the United States from the agreements made within the framework of the JCPOA on 8 May 2018 and the resumption of US sanctions policy against Tehran, it is unclear whether Iran still attaches any value to the JCPOA, despite the willingness shown by the European countries involved to honour the agreements as much as possible.³⁶ In a statement, the Iranian leadership have in any event set tough new conditions.³⁷ The US withdrawal did not come as a surprise. President Trump had announced on 13 October 2017 that he would withhold certification of compliance

31 Statement before the House Committee on Foreign Affairs, Subcommittee on Terrorism, Nonproliferation and Trade and Subcommittee on Asia and the Pacific, 'More Than a Nuclear Threat: North Korea's Chemical, Biological and Conventional Weapons', testimony by Anthony H. Cordesman, 17 January 2018.

32 Lawrence Freedman, 'Deterrence', 2004, p. 104.

33 On 14 July 2015, following a long series of intensive negotiations facilitated by the EU High Representative, the E3+3 (the United Kingdom, France and Germany plus the United States, China and Russia) and Iran agreed on the Joint Comprehensive Plan of Action on the Iranian nuclear programme (JCPOA). See: <<https://www.armscontrol.org/factsheets/JCPOA-at-a-glance>>.

34 Letter to the House of Representatives of 21 August 2015 about the JCPOA.

35 See: <<https://www.iaea.org/sites/default/files/18/11/gov2018-47.pdf>>.

36 See: <<https://www.reuters.com/article/us-iran-nuclear/iran-reopens-uranium-feedstock-plant-in-preparation-to-boost-enrichment-idUSKBN1JN2NN>>.

37 See: <<http://english.khamenei.ir/news/5696/To-remain-in-JCPOA-Imam-Khamenei-announces-conditions-to-be>>.

with the JCPOA and at the same time presented his new strategy on Iran.³⁸ As the announcement made clear, the Trump administration believes that Iran still poses a serious threat and that the JCPOA offers insufficient guarantees for curtailing Iran's destabilising activities, including its nuclear ambitions. According to the White House, the JCPOA's main shortcomings are the finite nature of the nuclear provisions – the so-called 'sunset clauses'³⁹ – and the absence of conditions restricting the further development of Iranian missile technology and preventing arms exports, in particular to Yemen, interference in neighbouring countries and support to terrorist organisations. The United States and Israel are acting in concert to prevent Iran from gaining a foothold in Syria, where it has expanded its influence and its presence, military and otherwise, since the civil war.

The EU's condemnation of the United States' unilateral withdrawal shows the current transatlantic discord on how to curb Iran's nuclear ambitions. The unilateral action taken by the United States raises questions about the future of diplomatic negotiations and the sustainability of agreements to limit the role of nuclear weapons.

1.3 A world without nuclear weapons?

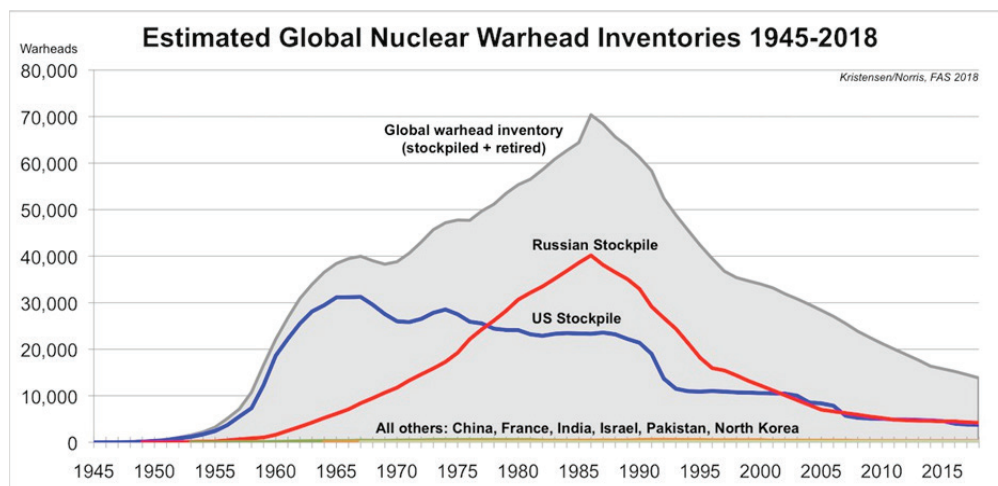
After the end of the Cold War many people hoped or expected that the most destructive weapons ever invented would be steadily reduced and gradually lose their significance. The total number of nuclear weapons worldwide has been cut from an estimated 70,000 at the height of the Cold War to less than 15,000 today. A major contribution has been made by the reduction of the nuclear arsenals of the United States and the former Soviet Union, as a result of bilateral treaties and unilateral measures. These steps were possible because the threat of a military confrontation between 'East' and 'West' had disappeared in 1991 following the disintegration of the Soviet Union. Confidence that the role of nuclear weapons would continue to diminish has been eroded by the international events of recent years. All nuclear-weapon states are now either engaged in or considering modernisation programmes.⁴⁰ For the first time since the end of the Cold War, the United States and Russia seem to be assigning a greater role to nuclear deterrence. Concerns about this have grown, especially in non-nuclear-weapon states, which fear that a new arms race and further proliferation are becoming inevitable. Many countries and organisations have backed a new treaty for the elimination of nuclear weapons, referred to as the Nuclear Ban Treaty. The Swedish research institute SIPRI has described this as 'Opposing trends: The renewed salience of nuclear weapons and nuclear abolitionism'.⁴¹

38 See: <<https://www.whitehouse.gov/briefings-statements/president-donald-j-trumps-new-strategy-iran/>>.

39 Critics stress that Iran will in any event be free to expand and renew its enrichment capacity after those 10 years and to raise the enrichment level after 15 years and increase its uranium stockpiles. This would allow it to reduce the breakout time to a matter of weeks and become a nuclear threshold state after all.

40 According to the latest estimates, nine nuclear-weapon states have between them 14,465 nuclear weapons, of which 3,750 have been deployed. SIPRI Yearbook 2018: 'Armaments, Disarmament and International Security' (summary), p. 11. The downward trend in the total number of nuclear weapons seems to have flattened out in comparison with 10 years ago. See: SIPRI Factsheet, 'Trends in World Nuclear Forces, 2017', April 2017.

41 Dr Tytti Erästö and Dr Tarja Cronberg, SIPRI Insights on Peace and Security, 'Opposing trends: The renewed salience of nuclear weapons and nuclear abolitionism', No. 2018/5, September 2018.



Source: Kristensen/Norris, Federation of American Scientists 2018.

Almost all states in the world are parties to the Treaty on the Non-Proliferation of Nuclear Weapons (NPT), which entered into force in 1970. The non-nuclear-weapon states undertook in the NPT not to develop nuclear weapons. The five nuclear-weapon states that ratified the treaty committed to the objective (with no deadline) of scaling back their nuclear arsenals and eliminating them altogether in due course. Five countries of the international community are not parties to the treaty, including four nuclear-weapon states (India, Pakistan, Israel and North Korea). Although President Kennedy's expectation that the number of nuclear-weapon states could rise to 25 has not materialised, only limited progress has been made with curbing nuclear weapons in recent years. Not a single nuclear-weapon state has taken – or is even considering taking – serious steps to eliminate its arsenal. The strategies of France and the United Kingdom are based on maintaining their sovereign status in the nuclear field as a safeguard for national security. China continues to steadily build an invulnerable nuclear retaliation capability. India and Pakistan seem embroiled in a race to expand their nuclear production capacity, which may result in a considerable expansion of their arsenals in the coming decade. Israel, which neither confirms nor denies possession of nuclear weapons (a policy referred to as 'nuclear ambiguity'), is focusing on developing various types of ballistic and cruise missiles, some of which can, according to analysts, be equipped with nuclear warheads.

Since 2010 the Humanitarian Initiative, backed by governments, the International Red Cross, the Holy See, various UN institutions and non-governmental organisations, has been highlighting the possibility of a worldwide ban on nuclear weapons. Momentum had been generated in part because former politicians had pointed out the great dangers of nuclear weapons⁴² and President Obama, in a speech in Prague on 5 April 2009, announced concrete steps to achieve what he termed 'global zero', a world free of nuclear weapons. The usefulness (military and otherwise) of American nuclear weapons in Europe became a subject of debate both in Europe and in NATO. During the NPT review conference in 2010 and subsequent international conferences in 2013 and

42 In several opinion editorials in the Wall Street Journal from 4 January 2007 onwards, George P. Shultz, William J. Perry, Henry A. Kissinger and Sam Nunn drew attention to the dangers of nuclear weapons and outlined the steps they believed were necessary to achieve a nuclear-free world. See: <https://www.nti.org/media/pdfs/NSP_op-eds_final_.pdf?_=1360883065>.

2014, all countries present expressed their concern about the ‘catastrophic humanitarian consequences’ of the use of nuclear weapons.⁴³ The conferences also prompted the Holy See to review its position on nuclear deterrence and possession of nuclear weapons. During the Cold War the Holy See still considered the limited possession of nuclear weapons to be justified, but on 10 November 2017 the Pope spoke out for the first time against the possession of nuclear weapons.⁴⁴ The International Campaign to Abolish Nuclear Weapons (ICAN) coordinated the contributions of civil society organisations in the Humanitarian Initiative and successfully lobbied from December 2016 onwards for UN negotiations on a legally binding instrument to prohibit nuclear weapons. ICAN, which is now an international coalition of 468 NGOs from more than 100 countries, including the Dutch organisation PAX, received the Nobel Peace Prize for 2017 for its efforts to this end.

A public debate about nuclear disarmament is still under way in the Netherlands, perhaps as a consequence of the tradition of the anti-nuclear movement of the 1980s. The debate also focuses on whether the possession, let alone the use, of nuclear weapons is justifiable from the perspective of medical ethics.⁴⁵ This debate is not new, but is in some respects more heated than a few decades ago. Those in favour of a nuclear weapons ban argue that possession of nuclear weapons cannot be legitimate on account of the permanent threat they pose to humans and their environment. Although it might be possible to reduce the risks of technical and human failure in handling nuclear weapons, they cannot be completely eliminated and sooner or later they are bound to result in major accidents. Only the elimination of nuclear weapons can save the world from this scenario. Opponents of the nuclear weapons role also argue that such weapons are useless in military terms: using them would in all cases be in conflict with international humanitarian law due to the indiscriminate nature of the weapons and the disproportionate effects of nuclear explosions. Moreover, a nuclear war cannot be won and would have catastrophic consequences for all parties involved and much of humanity.⁴⁶ They argue NATO and the Netherlands should consider acting unilaterally, put an end to nuclear sharing and thus contribute to the goals of the non-proliferation regime.⁴⁷ Lastly, it should be possible, bearing in mind the internationally respected ban on chemical, biological and bacteriological weapons, to establish a globally accepted standard that effectively prevents the possession of nuclear weapons.

43 Including the contribution of the Holy See (the Vatican): ‘Nuclear Disarmament: Time for Abolition. A Contribution of the Holy See’, Permanent Mission of the Holy See to the United Nations and other International Organisations in Geneva, Vienna, 8 December 2014. See: <<http://www.fciv.org/downloads/Holy%20See%20Contribution-Vienna-8-DEC-2014>>.

44 Address of His Holiness Pope Francis to Participants in the International Symposium ‘Prospects for a World Free of Nuclear Weapons and for Integral Disarmament’, Clementine Hall, 10 November 2017. See: <http://w2.vatican.va/content/francesco/en/speeches/2017/november/documents/papa-francesco_20171110_convegno-disarmointegrale.html>. For a review of the address, see: <<https://www.armscontrol.org/act/2017-12/news/pope-condemns-having-nuclear-weapons>>.

45 See: <<https://www.nvmp.org/ippnw/>> and <<https://www.rodekruis.nl/over-ons/humanitair-oorlogsrecht/kernwapens/>>.

46 Mathias Nebel and Gregory M. Reichberg, ‘Nuclear Deterrence: an Ethical Perspective’, The Caritas in Veritate Foundation, Working Paper VI, 2015. See: <<http://www.fciv.org/publications/WP6-Book>>.

47 See: <http://www.pugwash.nl/wp-content/uploads/TNW_Reciprocity_Pugwash_NL.pdf>.

Against this background, the House of Representatives, supported by civil society initiatives,⁴⁸ has in recent years passed a series of motions urging the government to take concrete follow-up steps on nuclear disarmament. Various motions requested termination of nuclear sharing and have urged the government to advocate this within NATO, as well as the removal of the US sub-strategic nuclear weapons from Europe, and to push for more transparency about any weapons present in the Netherlands and agreements with the United States. The House of Representatives also asked the government to take part in the international talks on the treaty to prohibit nuclear weapons.⁴⁹ The government wishes to promote global nuclear disarmament and, in this context, is working for non-proliferation and the ultimate goal of a world free of nuclear weapons, in accordance with the obligations under Article VI of the NPT. The emphasis is also on the process that will enable this goal to be achieved in a safe and stable manner (letter to the House of Representatives of 21 June 2018, Parliamentary Paper 33 694, no. 20). At the same time, successive governments have considered nuclear weapons to be a crucial part of NATO deterrence and defence as long as such weapons are in existence. The Netherlands will therefore continue to meet its obligations within the Alliance, including its nuclear task involving a squadron of F-16s (DCA task). According to the request for advice, the plan is for the F-35 to take over the nuclear task from the F-16, although a decision to that effect is partly dependent on the international circumstances and the agreements made within NATO (Letters to Parliament 33 783, no. 5 / 34 419, no. 18).

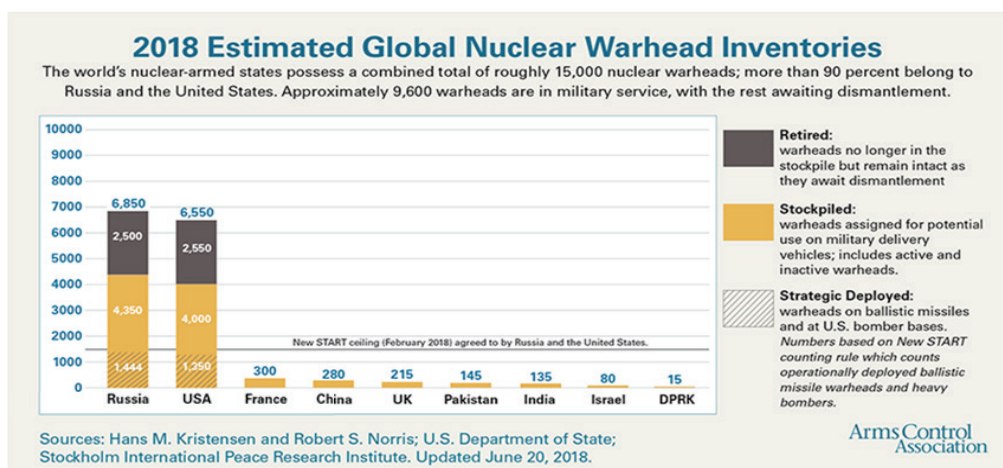


Figure taken from: <<https://www.armscontrol.org/factsheets/Nuclearweaponswhohaswhat>>. Sources: Hans M. Kristensen and Robert S. Norris; U.S. Department of State; Stockholm International Peace Research Institute.

Dissatisfaction about the slow progress in the negotiations on eliminating nuclear weapons played a role in the development of the international treaty for the elimination

48 For example, see: <<https://www.paxvoorvrede.nl/wat-wij-doen/campagnes/teken-tegen-kernwapens>>.

49 The following motions were passed on this subject in the period 2010-2018: Parliamentary Paper 33 694, no. 31; Parliamentary Paper 33 694, no. 30; Parliamentary Paper 33 694, no. 24; Parliamentary Paper 33 694, no. 15; Parliamentary Paper 34 419, no. 12; Parliamentary Paper 34 419, no. 11; Parliamentary Paper 34 419, no. 10; Parliamentary Paper 34 419, no. 9; Parliamentary Paper 33783, no. 19; Parliamentary Paper 33 783, no. 18; Parliamentary Paper, 33 783 no. 10; Parliamentary Paper 33 736, no. 14; Parliamentary Paper 33 400 V, no. 65; Parliamentary Paper 32 123 V, no. 86.

of nuclear weapons (Treaty on the Prohibition of Nuclear Weapons, also known as the Nuclear Ban Treaty), which makes elimination mandatory for state signatories.⁵⁰ At the urging of civil society organisations, national parliaments and others, international negotiations resulted in the approval by 122 countries of the text of the treaty in the General Assembly of the United Nations on 7 July 2017. However, the treaty lacks the support of the nuclear weapons states and their allies. One country (Singapore) abstained from voting and 69 countries did not take part in the vote, including all NATO members except the Netherlands. The nuclear-weapon states boycotted the negotiations, partly because they see the Nuclear Ban Treaty as undermining the NPT and believe it diverts attention from the years of negotiations about a Fissile Material Cut-Off Treaty and the ratification of the Comprehensive Test Ban Treaty.

The Netherlands was the only participating country to vote against adoption of the text because the result did not adequately meet the five criteria it had set beforehand.⁵¹ According to these criteria, the new instrument should be a useful and effective step towards the comprehensive elimination of nuclear weapons, properly complement other existing instruments, in particular the NPT, be supported by nuclear possessor states, and be verifiable and compatible with the Netherlands' obligations as a NATO Ally. In a statement explaining its vote the Netherlands once again stressed that it could not support the text on account of its incompatibility with NATO obligations, the absence of an adequate verification mechanism and the fact that it was in competition with the NPT.⁵² Remarkably, the government of Switzerland, where ICAN is based, has also announced that it would not sign the Nuclear Ban Treaty at this time.⁵³ As Switzerland is a country that attaches great importance to its neutrality and compliance with international law, a notable point in its argument is the fact that, should Switzerland wish to join a nuclear alliance for self-defence purposes, signing the Nuclear Ban Treaty would make this legally impossible.⁵⁴ According to Swiss media, this refers to membership of NATO.⁵⁵ On 12 December 2018 the Swiss parliament called on the government to ratify the Treaty nevertheless.

50 See: <<https://www.armscontrol.org/factsheets/nuclearprohibition>>. This fact sheet on the Nuclear Ban Treaty summarises the multiple reasons for negotiating the Treaty as follows: 'renewed recognition of the catastrophic humanitarian consequences of nuclear weapons use, the rising risk of accidental or intentional nuclear use, and a growing sense of frustration that key nuclear disarmament commitments made by the nuclear-weapon states were not being fulfilled'.

51 Letter from the Minister of Foreign Affairs and the Minister of Defence to parliament on nuclear disarmament and non-proliferation, Parliamentary Paper 33 783, no. 24, 24 March 2017.

52 See: <<https://www.permanentrepresentations.nl/latest/news/2017/07/07/explanation-of-vote-of-ambassador-lise-gregoire-on-the-draft-text-of-the-nuclear-ban-treaty>>.

53 The Swiss Federal Council has made clear in its declaration that it will participate as an observer in the first review cycle of the Treaty. In preparation for this, the Swiss Ministry of Foreign Affairs is expected to report to the Federal Council by no later than 2025 on the developments surrounding the Nuclear Ban Treaty. See: <<https://www.admin.ch/gov/en/start/documentation/media-releases.msg-id-71821.html>>.

54 Swiss Federal Department of Foreign Affairs, 'Report of the Working Group to analyse the Treaty on the Prohibition of Nuclear Weapons', 30 June 2018, p. 9: 'Even in a case of its self-defence, Switzerland would not be legally permitted to join a defence alliance which is based on nuclear deterrence.'

55 See: <<https://www.tagesanzeiger.ch/schweiz/standard/der-bundesrat-und-wie-er-lernte-die-bombe-zu-lieben/story/15483700>>.

II International legal framework, ethics and nuclear weapons

II.1 Ethical principles and international law

For obvious reasons, a large part of society disapproves of nuclear weapons, the most destructive weapons ever invented. Apart from legal and ethical arguments, the risk of nuclear escalation would be a particularly relevant factor if a nuclear weapon were to be used against another nuclear-weapon state. The first use of a nuclear weapon since the Second World War would undoubtedly carry a great risk of escalation, with unacceptable consequences. The AIV therefore believes that, as long as there are nuclear weapons, it will be necessary to ensure that they are never used. Ethical principles and international law play an essential role in this regard.

National and international law are based on ethical principles, which are broader in scope than the law. Moreover, the law does not provide for every conceivable situation. Where there are gaps in the law, it is possible to fall back on ethical principles in order to reach a decision concerning permissible actions. A responsible government should be guided by ethical principles and international law, with due regard for the consequences that its actions – or non-action – could have on international political relations.⁵⁶

Any appraisal of the international legal framework needs to distinguish between possession of nuclear weapons on the one hand and the threat or use of nuclear weapons on the other. A factor of particular importance in relation to the possession of nuclear weapons is arms control law, which should be viewed in the context of the wider concept of arms control. In arms control a special role is assigned to the NPT and the obligation it imposes to achieve properly verifiable general nuclear disarmament through negotiation. Chapter IV deals at length with arms control.

Possession of nuclear weapons is first briefly discussed below. This is followed by consideration of the threat or use of nuclear weapons. This includes consideration of the opinion of the International Court of Justice on the legality of the threat or use of nuclear weapons. Finally, ethical aspects relating to the possession, threat and use of nuclear weapons are discussed.

II.2 International law and possession of nuclear weapons

It is a generally recognised principle, confirmed by the International Court of Justice, that in international law 'there are no rules, other than such rules as may be accepted by the State concerned, by treaty or otherwise, whereby the level of armaments of a sovereign State can be limited, and this principle is valid for all States without exception'.⁵⁷

⁵⁶ The comment by committee member Van Walsum on page 270 of the report by the Davids Committee (which investigated the decision-making that led to the Netherlands' political support for the invasion of Iraq in 2003) concerns these relations.

⁵⁷ Case Concerning Military and Paramilitary Activities in and against Nicaragua, International Court of Justice, 27 June 1986. See also: 'The existence of a "legal gap"', Open-ended Working Group taking forward multilateral nuclear disarmament negotiations, Geneva, 12 April 2016, contribution of the Netherlands.

Any provisions governing the possession of nuclear weapons are contained in specific instruments of arms control. The international community has regulated or prohibited certain types of weapons, especially weapons of mass destruction, through multinational conventions. With regard to nuclear weapons, the bilateral arms control agreements between the United States and Russia are particularly important. However, the most important instrument relating to nuclear arms control is the NPT (the Treaty on Non-Proliferation of Nuclear Weapons). Article VI of the NPT obliges the states that are parties to the Treaty: ‘...to pursue negotiations in good faith on effective measures relating to cessation of the nuclear arms race at an early date and to nuclear disarmament [...]’.

States have consistently interpreted Article VI of the NPT as imposing not only a ‘best efforts’ obligation but also an obligation to achieve a specific result, as shown – by consensus – in numerous final documents of NPT Review Conferences and unanimously confirmed by the International Court of Justice in 1996. The NPT contains the only applicable international provision obliging states to strive for the total elimination of all nuclear weapons.

A Dutch court ruled on nuclear weapons in response to the proposed deployment of cruise missiles at the Dutch air base Woensdrecht (NATO decision in 1979). Stichting Verbiedt de Kruisraketten (SVK / the Ban Cruise Missiles Foundation) applied to The Hague district court and, on appeal, The Hague Court of Appeal for a declaratory judgment ruling that this deployment was unlawful. On appeal in cassation, the Supreme Court held that there was no peremptory norm of international law prohibiting deployment.⁵⁸

II.3 International law and the threat or use of nuclear weapons

Legal bases for the use force between states

Article 2 (4) of the Charter of the United Nations prohibits the threat or use of force in international relations. This prohibition is often considered a rule of peremptory international law that permits no exceptions, except in recognised exceptional cases. The AIV/CAVV has discussed the international legal framework for the use of force between states (*jus ad bellum* or *jus contra bellum*) in previous advisory reports.⁵⁹ In a nutshell, the framework provides as follows. The use of force in international relations is prohibited unless a state is able to invoke one or more of the recognised exceptions to this rule, namely: 1) a UN Security Council mandate authorising the use of force to

58 Supreme Court 10 November 1989, ECLI:NL:HR:1989:AC1679, NJ 1991/248, considerations 3.6-3.7.

‘SVK has not cited any rule of international law that expressly prohibits possession of such weapons, nor does any such rule exist. It can be inferred from the very existence of the Treaty on the Non-Proliferation of Nuclear Weapons (NPT) (Dutch Treaty Series 1968, 126) that an unwritten rule of international law does not exist either. (...). Nor is it possible to accept as correct the submission that possession of cruise missiles equipped with nuclear warheads as a preparatory act for the possible use of these weapons in time of war is unlawful because the use of these weapons is contrary to one or more rules of international law. International law as it stands cannot be said to prohibit every use of such weapons. Although international law does prohibit certain forms of such use, it is implicit in the NPT (...) that the cruise missiles to which it relates should not be used for this purpose.’

59 CAVV, *Advisory Report on Armed Drones*, CAVV advisory report no. 23, The Hague, July 2013. AIV/CAVV, *Cyber Warfare*, AIV advisory report no 77/CAVV advisory report no. 22, The Hague, December 2011.

maintain or restore international peace and security; (2) individual or collective self-defence of one or more states against an armed attack (Article 51 of the Charter); or (3) the valid consent of another state to use force within its territory.

All three exceptions are subject to further conditions. For example, the use of force on the basis of a Security Council mandate must be consistent with the conditions and objectives of the mandate in question. The right of self-defence can only be invoked in the case of an actual or imminent armed attack. The requirements on what constitutes a state's valid consent to the use of force within its territory are elaborated in the Draft Articles on the Responsibility of States for Internationally Wrongful Acts by the International Law Commission (ILC) and can be analogously derived from the requirements laid down in the 1969 Vienna Convention on the Law of Treaties. The principles of necessity, proportionality and immediacy apply to every use of force between states.

These rules on the use of force between states apply to every use of force in international relations, regardless of the type of weapons being used. When one of the internationally recognised legal bases for the use of force is invoked, the legality of that use of force depends on the particular circumstances of the case. If the UN Security Council issues a mandate to take all necessary measures to counter a threat to the peace, breach of the peace or act of aggression, the use of a specific weapon system will be examined for compatibility with the mandate. The decision to use a particular weapon only influences the legality of the use of force in exceptional cases. In addition, certain weapons fall under an arms control regime that totally bans specific weapons (e.g. chemical and biological weapons)⁶⁰ or subjects them to specific restrictions. In such cases, possession or use may constitute a violation of the regime in question. As a rule, however, the legality of using a specific weapon is not regulated by *jus ad bellum*. In conclusion, every use of force is subject to the same rules.

Possession of nuclear weapons or demonstrating that preparations have been made to use them in extreme circumstances does not automatically constitute 'the threat of force' within the meaning of Article 2.4 of the UN Charter. Merely possessing a weapon with which no explicit threat is made differs from explicitly making threats against other parties that they can or will be attacked with this weapon, even though the knowledge that a state possesses nuclear weapons carries an implicit threat that the state concerned may, in certain extreme circumstances, consider explicitly threatening to use it or actually using it.

Legal regimes applicable to the use of force

In addition to a valid legal basis, every use of force requires those involved to act in accordance with the relevant legal regime. This concerns international humanitarian law (IHL) and human rights.

The IHL regime only applies to armed conflict situations. It comprises an extensive system of rules and principles and is specifically designed to regulate these types of

⁶⁰ International humanitarian law prohibits the use of weapons if, when using them, it is impossible to distinguish between military targets (individuals and objects), on the one hand, and civilians and civilian objects, on the other, if they cause unnecessary suffering and/or excessive injury to enemy combatants and, in the case of both weapons and methods of warfare, if their effects cannot be controlled in a manner prescribed by the international humanitarian law, resulting in indiscriminate harm to civilians and enemy combatants.

situations. IHL has been discussed at length in previous advisory reports of the AIV/CAVV.⁶¹ Outside the context of armed conflict, IHL does not apply and the use of lethal force is mainly governed by the human rights regime (which is implemented in rules of national law that are not dealt with here). In all situations where lethal force is or can be applied, whether in connection with an armed conflict or otherwise, the human rights regime, like national law, requires that an adequate, transparent and independent reporting and monitoring procedure be established to ensure that the action is carried out in accordance with all legal requirements and, where necessary, to take timely and adequate action to prevent or prosecute violations of the applicable law. Under IHL there is a duty to investigate and prosecute alleged violations, or to take measures to prevent repetition.⁶²

IHL applies to individual cases of the use of force and does not as such lay down general rules on, for example, a prohibition on the use of certain types of weapons. This is regulated in arms control law (for example in the Chemical Weapons Convention). IHL regulates the use of force and the protection of specific categories of persons and objects that may not be attacked – or only under strict conditions.⁶³ The distinction between military targets, on the one hand, and civilians and civilian objects, on the other, lies at the heart of the regulation of hostilities. The principle of distinction must always be applied in the planning and execution of an attack. This means, for example, that attacks must be directed against a military target. Attackers may only use a means (weapon) or method of warfare that allows them to distinguish between military targets, on the one hand, and civilians and civilian objects, on the other.

IHL also prohibits any use of weapons that has disproportionate consequences. It defines a disproportionate attack as an attack on a military target which may be expected to cause loss of civilian life, injury to civilians and/or damage to civilian objects that would be excessive in relation to the concrete and direct military advantage afforded by the attack. The relevant standard is that of the reasonable commander or combatant who weighs the expected collateral damage against the anticipated military advantage in good faith, based on information available at the time of the attack.

The use of weapons must always be planned and executed with the necessary continuous precaution in order to protect the civilian population, individual civilians and civilian objects as much as possible from damage and injury. This means that the party using the weapons must do their utmost to ensure that the person or object selected for attack actually constitutes a military target. Attacks must be executed in such a way that collateral damage and collateral casualties are kept to a minimum. Moreover, the party using the weapons must warn the civilian population prior to an attack, unless doing so would significantly undermine its success. Finally, the use of weapons must be suspended or cancelled if it is likely to cause excessive incidental injury or harm.

61 CAVV, *Advisory Report on Armed Drones*, CAVV advisory report no. 23, The Hague, July 2013. AIV/CAVV, *Cyber Warfare*, AIV advisory report no 77/CAVV advisory report no. 22, The Hague, December 2011.

62 *Armed Drones*, CAVV advisory report no. 23, The Hague, July 2013.

63 See also: AIV and CAVV, *Autonomous Weapon Systems: the Need for Meaningful Human Control*, AIV advisory report no. 97 / CAVV advisory report no. 26, The Hague, October 2015.

*Advisory opinion of the International Court of Justice*⁶⁴

The International Court of Justice (ICJ) declared unanimously that a threat or use of force by means of nuclear weapons that is contrary to Article 2, paragraph 4 of the United Nations Charter and that fails to meet all the requirements of Article 51 ('the inherent right of individual or collective self-defence if an armed attack occurs') is unlawful.

It also declared unanimously that a threat or use of nuclear weapons should also be compatible with the requirements of international law applicable in armed conflict, particularly those of the principles and rules of international humanitarian law, as well as with specific obligations under treaties and other undertakings which expressly deal with nuclear weapons. By the smallest possible majority the Court arrived at the crucial view that:

'...the threat or use of nuclear weapons would generally be contrary to the rules of international law applicable in armed conflict, and in particular the principles and rules of humanitarian law;

However, in view of the current state of international law, and of the elements of fact at its disposal, the Court could not conclude definitively whether the threat or use of nuclear weapons would be lawful or unlawful in an extreme circumstance of self-defence, in which the very survival of a State would be at stake'.⁶⁵

The ICJ's advisory opinion is examined at greater length in Annexe III.

However, the law on this subject continues to evolve: according to the NPT (see II.2) and the ICJ's last unanimous reply, states have an obligation to reach a ban on nuclear weapons through negotiation:

'There exists an obligation to pursue in good faith and bring to a conclusion negotiations leading to nuclear disarmament in all its aspects under strict and effective international control.'⁶⁶

The Treaty on the Prohibition of Nuclear Weapons, to which reference has already been made, is also relevant in this connection. This treaty reaffirms the objective of a nuclear-weapon-free world in accordance with Article VI of the NPT. However, the treaty lacks the support of the nuclear-weapon states and their allies. Ratification by at least 50 states is required for the treaty to enter into force, but as yet this has been done by only 19 of the 69 signatory states. The Netherlands was the sole NATO country to take part in the

64 On 15 December 1994 the UN General Assembly adopted a resolution requesting the International Court of Justice, one of the UN's principal organs, to give an advisory opinion on the legality of the threat or use of nuclear weapons: 'Is the threat or use of nuclear weapons in any circumstance permitted under international law?' In its advisory opinion, the ICJ analysed various applicable regimes related to this area of international law to determine whether the threat or use of nuclear weapons was intrinsically illegal. To this end it considered human rights conventions, the Genocide Convention, environmental laws, legislation on the use of force and international humanitarian law.

65 International Court of Justice, Advisory Opinion [1996] ICJ Rep. 226, para. 105 E.

66 Idem para. 105 F.

negotiations, but it decided that the outcome did not sufficiently meet the five criteria that it had set beforehand (see chapter I.3).

It is questionable whether any circumstances are conceivable in which the use of nuclear weapons would not contravene the provisions of international humanitarian law.⁶⁷ An example could be the use of a nuclear weapon with a relatively low yield against a military object outside an inhabited area, for instance on the high seas or in a desert or other remote area.⁶⁸ Whether or not the use is contrary to international humanitarian law must therefore be assessed on a case-to-case basis.

In considering whether to use a nuclear weapon, account must be taken of both the immediate and long-term health effects of radiation, the possible effect on the environment and the danger to civilians far beyond the area of detonation due to the risk of radioactive fallout. If several nuclear weapons are used, cumulative effects will have to be factored in. In the AIV's opinion, there are very few if any situations or locations conceivable where the use of a nuclear weapon would not contravene international humanitarian law.

As already noted, apart from legal arguments, the risk of nuclear escalation is a particularly relevant factor in the event that a nuclear weapon were to be used against another nuclear-weapon state. The first use of a nuclear weapon since the Second World War would undoubtedly carry a great risk of escalation with unacceptable consequences. The AIV therefore believes that it is of paramount importance to ensure that such a weapon is never used.⁶⁹

II.4 Ethics and nuclear weapons

Human dignity is an ethical principle that features prominently in the debate on nuclear weapons, as it forms the cornerstone of human rights and IHL. It is mentioned in the preambles of the UN Charter, the Universal Declaration of Human Rights, the European Convention for the Protection of Human Rights and Fundamental Freedoms, the Charter of Fundamental Rights of the European Union, the International Covenant on Civil and Political Rights and the International Covenant on Economic, Social and Cultural Rights. The last two identify human dignity as the source of human rights. IHL too reflects the need to protect human dignity.

67 Louis G. Maresca, 'Nuclear weapons: 20 years since the ICJ advisory opinion and still difficult to reconcile with international humanitarian law', 8 July 2016.

68 'Nuclear weapons under international law: an overview', October 2014, International Law and Policy Institute (ILPI) and the Geneva Academy of International Humanitarian Law and Human Rights.

69 Louis Maresca and Eleanor Mitchell, 'The human costs and legal consequences of nuclear weapons under international humanitarian law', *International Review of the Red Cross*, 97 (899), pp. 644-645.

The principle of humanity

This is one of the cardinal principles of IHL. The Martens clause⁷⁰ is one of several expressions of this principle in IHL and dates back to the Hague Peace Conferences that codified IHL for the first time. It also appears in the First Additional Protocol to the Geneva Conventions, where it provides that, in situations not covered by international agreements, civilians and combatants remain under the protection and authority of the principles of international law derived from established customs, from the principles of humanity and from the dictates of public conscience. This provision originally concerned the status of civilians who took up arms against an occupier, but is nowadays regarded as a general reminder that, in the absence of specific treaty rules, the actions of parties to an armed conflict remain subject to the principles of IHL and customary international law. Although there is no generally accepted interpretation of the Martens clause,⁷¹ it was referred to in the formulation of the prohibitions of poison gas, blinding laser weapons and anti-personnel mines.

Prevention of aggression

A large part of society disapproves of nuclear weapons as such.⁷² This is also evident from the Humanitarian Initiative and the International Campaign to Abolish Nuclear Weapons (ICAN) referred to in chapter I. The AIV shares this disapproval and considers the complete rejection of nuclear weapons in accordance with the norms of deontological ethics, leading to efforts towards their elimination, unilaterally if necessary, to be understandable and respectable. This does not mean, however, that a world without nuclear weapons, or with very few nuclear weapons, would automatically be more peaceful and stable than today's world. The 20th century's two world wars remind us that highly developed societies are capable of causing suffering and destruction on an indescribable scale, even without nuclear weapons. Since the Second World War, nuclear weapons have served in part as a barrier (psychological or otherwise) against aggression on the part of a strategic rival, and as a last resort whereby states under threat could prevent, resist or put an end to an overwhelming attack. Permanently living under such a threat is something people in Western Europe have not experienced for some decades, not since the periods of great East-West tension at the height of the Cold War, but it is still a continuous presence in the countries along the border with Russia and elsewhere in the world. As yet no other weapons exist that are thought to have a similar war-preventing effect. From the point of view of consequentialist ethics therefore (assessing the legitimacy of acts in terms of their consequences), there may also be important arguments in favour of not fully eliminating nuclear weapons as long as potential adversaries continue to possess or aim to possess them, and exploit that to their strategic advantage.

70 The clause dates from 1899 and is named after the Russian diplomat Friedrich Fromhold Martens, who was of Estonian extraction. 'Until a more complete code of the laws of war is issued, the High Contracting Parties think it right to declare that in cases not included in the Regulations adopted by them, populations and belligerents remain under the protection and empire of the principles of international law, as they result from the usages established between civilised nations, from the laws of humanity and the requirements of the public conscience.'

71 Rupert Ticehurst, 'The Martens clause and the laws of armed conflict', *International Review of the Red Cross*, No. 317.

72 Discussion with representatives of PAX, the Dutch Medical Association for Healthcare and Peace Issues Research (NVMP), Pugwash and the Dutch Red Cross on 30 May 2018.

The AIV is of the opinion that, given the current situation, the possession of nuclear weapons is justified only for the purpose of preventing war and as a precondition and starting point for negotiations to achieve mutual nuclear arms control, arms reduction and, ultimately, disarmament. This does not mean that it rejects the principle of humanity, nor that it is ignoring the inherent risks. Central to this view, however, is the duty to organise defence efforts in a way that reduces the risk of any war in which the use of nuclear weapons is a possibility, and the risk of accidents with nuclear weapons in peacetime, to a minimum.

The use of a nuclear weapon will fundamentally change the nature of a conflict and introduce a large degree of uncertainty as regards its further development, with possibly catastrophic consequences. Even in extreme cases, the AIV believes decision-makers must be fully aware of the possible consequences.

III Changes in the nuclear security context

III.1 The Russian and Chinese modernisation programmes

Russia

The role of nuclear weapons in Russian military strategy

Russia regards its nuclear arsenal as a crucial deterrent instrument for achieving various strategic objectives: preventing aggression against Russia and its allies and being capable of responding to the use of nuclear weapons and other weapons of mass destruction, as well as to a conventional attack that threatens the very existence of the state.⁷³ Analysts point out that Russia's nuclear weapons arsenal and its modernisation also play an important role in its efforts to be recognised as a major global power.⁷⁴ In all likelihood, Russia is not interested in a military showdown with strategic adversaries, but is instead preparing by means of exercises for the possibility that a regional conflict on or in the vicinity of the Eurasian landmass could result in a large-scale armed confrontation, with the risk of escalation to nuclear level.⁷⁵

The strategic triad is central to Russia's nuclear deterrence as the ultimate escalation option and retaliatory capability with which to deter states that have strategic nuclear weapons. In this area Russia still mainly seeks to maintain parity with the United States (doctrine of mutual assured destruction). The nuclear modernisation programme gives priority to replacing the obsolete systems in the three components of the triad, in particular the missile forces. The aim is to prevent the Russian second-strike capability from becoming vulnerable and hence losing credibility, since this is something which an adversary could exploit. Improvements to the survivability of the forces and to the early warning capability are intended to make it possible to mount a retaliatory attack instantly (launch on warning) in any scenario. From Russia's perspective, the main threat to the strategic balance is the development by the United States of advanced missile defence systems, space-based military assets and conventional prompt global strike (CPGS) weapons. The United States, in turn, is concerned about similar developments in Russia.⁷⁶ Russia's assertion that its intentions are purely defensive and designed to maintain stability is undermined by certain developments. The concerns mainly relate to the role played by sub-strategic nuclear weapons in Russia's nuclear doctrine for the management of regional conflicts.

73 For the English version of Russia's military doctrine, see: Embassy of the Russian Federation in the United Kingdom, 'Military Doctrine of the Russian Federation', 25 December 2014: section III, para. 27. Press release, 29 June 2015, <<https://rusemb.org.uk/press/2029>>.

74 See, for example, commentary on President Putin's 'State of the Union' address on 1 March 2018: Michael Shoebridge (ASPI), 'Putin's speech wasn't about weapons—it's worse than that', 14 March 2018, <<https://www.aspistrategist.org.au/putins-speech-wasnt-weapons-worse/>>.

75 Russia fairly regularly holds large-scale military exercises in the west near NATO territory (ZAPAD 2017) and in Eastern Siberia and the Russian Far East (VOSTOK 2018) where only China could possibly pose a threat to Russian territory. Although it cannot be said with any certainty what scenarios and potential adversaries are involved, analysts agree that the exercises often include a nuclear component. Russia also regularly holds exercises to test the readiness of its strategic nuclear forces.

76 *Reuters*, Stephanie Nebehay, 'U.S. warns on Russia's new space weapons', 14 August 2018.

Although Russia makes few if any announcements about its sub-strategic nuclear weapons or their modernisation, experts assume that the Russian armed forces still recognise the importance of this category of weapons as compensation for the presumed superiority of NATO's conventional forces, particularly those of the United States, in the event of a protracted large-scale conflict,⁷⁷ but increasingly also of China's ever stronger forces in the Far East. Moscow also points out that it has to take account of several nuclear-weapon states along its vast borders. Analyses have shown since the start of this century that Russia will consider limited use of nuclear weapons to deter military action by an adversary. The purpose of a demonstration strike of this kind would be to de-escalate the situation because an adversary would not wish to risk the possibility of a nuclear confrontation ending in total annihilation, certainly not if there are no vital interests at stake (i.e. the doctrine of 'escalate to de-escalate').⁷⁸ Public references by senior Russian officials to the use of nuclear weapons and their simulated use against targets in Europe reinforce this assumption. President Vladimir Putin also explicitly referred to Russia's nuclear potential during the annexation of Crimea in 2014.⁷⁹ Other analysts express reservations about this assumption since although there are reasons to be concerned about Russian nuclear policy it has not been conclusively shown that 'escalate to de-escalate' is truly part of Russia's nuclear doctrine or that it has lowered the threshold for the use of nuclear weapons.⁸⁰

Whatever the correct interpretation of Russian nuclear doctrine may be⁸¹, leading experts believe that Russia now interprets it in more dynamic and offensive terms than a decade ago. Russian officials have issued various messages about the use of nuclear weapons that seem to go beyond the publicly stated doctrine. Examples of this have been the explicit threat to use nuclear weapons against missile defence systems as well as in regional scenarios where there was neither an existential threat to Russia nor a potential use of weapons of mass destruction. The wide range of nuclear weapons it possesses and intends to develop suggests that Russian doctrine goes beyond mere

77 This mainly involves precision-guided munition (PGM) and advanced digital information networks (Command, Control, Communications, Computers, Intelligence, Surveillance and Reconnaissance; C4ISR).

78 See, for example: George E. Hudson, 'Russian Perspectives on Tactical Nuclear Weapons', in: 'Tactical Nuclear Weapons and NATO', Strategic Studies Institute, April 2012, <<http://www.StrategicStudiesInstitute.army.mil/>>; Mark B. Schneider, 'Russian Nuclear Weapons Policy. Implications for U.S. Nuclear Deterrence and Missile Defense', 28 April 2017, <https://www.realcleardefense.com/articles/2017/04/28/russian_nuclear_weapons_policy_111261.html>.

79 BBC, 'Ukraine conflict: Putin was ready for nuclear alert', 15 March 2015, <<https://www.bbc.com/news/world-europe-31899680>>.

80 See, for example: Olga Oliker, 'Russia's Nuclear Doctrine. What We Know, What We Don't, and What That Means', CSIS, May 2016, <<https://www.csis.org/analysis/russia%E2%80%99s-nuclear-doctrine>>; Bruno Tertrais, 'Does Russia really include limited nuclear strikes in its large-scale military exercises?', IISS, 15 February 2018, <<https://www.iiss.org/blogs/survival-blog/2018/02/russia-nuclear>>.

81 Speculation about this is fuelled by the fact that neither the contents of the classified annexe to the Russian military doctrine nor the precise scenarios and escalation steps provided for in the Russian military plans are known.

deterrence, and is partly aimed at regional nuclear use or nuclear blackmail.⁸² Such discrepancies can increase the risk of misconceptions and misjudgments.

Modernisation of nuclear arsenal

Russia had made considerable progress on phasing out its Soviet-era nuclear weapons and replacing them with more modern systems, albeit fewer in number. The modernisation programme is set to continue until the mid-2020s and is expected to halt the decades-long reduction of the Russian nuclear arsenal. Russia is carrying out a large-scale modernisation of its strategic nuclear forces within the limits of the New START Treaty. This concerns the entire strategic triad of intercontinental ballistic missiles (ICBMs), submarine-launched ballistic missiles (SLBMs) and nuclear-capable, long-range bombers. For a summary of how the strategic triad is being modernised, see annexe IV.⁸³

Moreover, the Russian modernisation programme relates to a still substantial and varied arsenal of sub-strategic nuclear weapons consisting of an estimated 1,800–2,000 nuclear warheads (some with a very low yield), which can be launched from the ground, air or sea (ships and submarines). Very little information is available about the precise composition and numbers of the sub-strategic arsenal or about the plans for its modernisation. It probably includes nuclear payloads for short-range ballistic missiles, air-to-surface missiles, gravity bombs, depth charges, torpedoes, anti-ship/anti-submarine missiles and air defence missiles.

According to US analyses, Russia is deliberately expanding this part of the arsenal not covered by the New START Treaty to include dual-capable systems, suitable for tactical use in various areas of operations.⁸⁴ For example, modernised Russian ships and nuclear-powered attack submarines are equipped with dual-capable cruise missiles (SS-N-30 Kalibr and possibly also SS-N-26), and the MiG-31BM (Foxhound) interceptor aircraft possibly are possibly equipped with a new dual-capable air-to-ground missile (Kh-47M2 Kinzhal), which has a reported range of 2,000km.⁸⁵ Finally, mention should be made here of the introduction of a new land-based dual-capable cruise missile (see below) and the modernisation of the ballistic missile defence systems equipped with nuclear payloads, for example around Moscow.

New focal points

In 2017, the vice chairman of the US Joint Chiefs of Staff confirmed to Congress that in recent years Russia had tested and deployed a new type of land-based cruise missile. The missile's range is such that it would be in violation of the INF Treaty. This is the 9M729, also referred to by NATO as the SSC-8. In March 2018, the commander of U.S. Strategic Command informed Congress that Russia was stepping up the production and

82 Hans M. Kristensen and Robert S. Norris, 'Russian Nuclear Forces, 2018', *Bulletin of the Atomic Scientists*, 2018, Vol. 74, No. 3, pp. 185–195, <<https://doi.org/10.1080/00963402.2018.1462912>>.

83 For a complete overview of the Russian nuclear arsenal and modernisation programme, see: Hans M. Kristensen and Robert S. Norris, 'Russian Nuclear Forces, 2018', *Bulletin of the Atomic Scientists*, 2018, Vol. 74, No. 3, pp. 185–195, <<https://doi.org/10.1080/00963402.2018.1462912>>.

84 2018 U.S. Nuclear Posture Review, February 2018, p. 9.

85 Hans M. Kristensen and Robert S. Norris, 'Russian Nuclear Forces, 2018', *Bulletin of the Atomic Scientists*, 2018, Vol. 74, No. 3, pp. 185–195, <<https://doi.org/10.1080/00963402.2018.1462912>>.

introduction of this new weapon.⁸⁶ Russia has denied the violation and in turn accused the United States of breaching the INF Treaty on three counts: (i) developing prototypes of intermediate-range missiles for testing missile defence systems; (ii) using remote-controlled unmanned aerial vehicles for combat missions, which Moscow argues are comparable to land-based cruise missiles; and (iii) deploying US ballistic missile defence (BMD) systems in Romania and Poland, which could possibly be configured to launch missiles prohibited by the INF Treaty. The final point concerns the Aegis Ashore vertical launch system, which is practically identical to the systems on US naval vessels for launching cruise missiles. As regards the first two points, the legal position of the United States is virtually unassailable since there is no violation of either the letter or the spirit of the treaty. Nor has the letter of the treaty been violated in respect of the third point, as these fixed launch systems have never been tested for launching cruise missiles from land.⁸⁷ The alleged violations have also been used by Russia as an argument for deploying dual-capable ballistic missiles in Kaliningrad and in Crimea (Iskander-M with a range of 400km). The deployment of the Iskander-M in Kaliningrad poses a direct threat to military and political targets in the surrounding NATO countries.⁸⁸ NATO has emphasised that the BMD system is intended to be defensive and is a response to the missile threat from Iran in particular. Russia counters, however, that the systems, including the radar components, are targeted at Russian territory. Nonetheless, BMD systems are not capable of eliminating Russian intercontinental missiles as those would be routed over the North Pole in the event of an attack on the United States.

Incidentally, the United States is concerned that Russia and China have taken the lead in developing hypersonic weapons.⁸⁹ These are missiles, projectiles or cruise missiles that travel at least five times the speed of sound and often much faster. Statements about this by President Putin have fuelled US concerns about Russia.⁹⁰ In mid-December 2018, President Putin announced that Russia had taken the Avangard hypersonic nuclear-capable glide vehicle into production and that a first regiment equipped with the new missile system would be operational in the coming year.⁹¹ It has been known for some time that Russia is investing in the development of hypersonic missile technology

86 Radio Free Europe, 'U.S. Says Russia Deployment of "Banned" Cruise Missile Increasing', 20 March 2018, <<https://www.rferl.org/a/united-states-russia-increasing-deployment-of-banned-cruise-missile/29111751.html>>.

87 Vladimir Frolov, 'Met rakettencrisis INF-verdrag betreden we nieuw tijdperk', *Raam op Rusland*, 12 December 2018, <<https://raamoprusland.nl/dossiers/militair-beleid/1160-met-rakettencrisis-inf-verdrag-betreden-we-nieuw-tijdperk>>.

88 In this context, the reports of a major upgrade of an active storage facility for nuclear weapons in Kaliningrad give cause for concern. See: Hans M. Kristensen, 'Russia Upgrades Nuclear Weapons Storage Site In Kaliningrad', *Federation of American Scientists*, 18 June 2018, <<https://fas.org/blogs/security/2018/06/kaliningrad/>>.

89 *The Times*, 'Need for speed: why the US is spending billions in a hypersonics arms race', 10 August 2018.

90 See: <<https://www.militarytimes.com/author/vladimir-isachenkov/>>.

91 For example, see: 'Putin says Russia is ready to deploy new hypersonic nuclear missile', *Reuters*, 26 December 2018 and 'Russia to unleash "Avangard" hypersonic missiles, evade U.S. defenses worldwide, Putin boasts', *The Washington Times*, 26 December 2018.

capable of penetrating advanced missile defence systems. In his annual address on 1 March 2018, President Putin drew attention not only to the Avangard and the hypersonic Kinzhal missile but also to other new nuclear weapon systems designed to enhance Russia's status as a major nuclear power. Besides the heavy SS-X-29 Sarmat ICBM, these weapons include a nuclear-powered cruise missile and a nuclear-powered, long-range unmanned underwater vehicle (Status-6 torpedo). Nuclear-powered cruise missiles are a technology dating back to the Cold War, which Russia has very probably not yet managed to put into practice.⁹² The Status-6 is also possibly a Cold War concept intended to instil fear ('doomsday weapon'). Russia already has nuclear torpedoes that can be launched from submarines and surface vessels. However, owing to the many technical hurdles, there is little likelihood that a nuclear-powered and nuclear-armed underwater system capable of autonomously crossing the Atlantic and mounting an attack will become operational in the foreseeable future. It is therefore better to regard this as the announcement of a ground-breaking research programme for the development of advanced underwater technology.⁹³

China

Role of nuclear weapons in Chinese military strategy

China's nuclear deterrence policy is based on the principle of assured retaliation. This means that the strategic missile forces must be able to withstand an attack sufficiently to be capable of mounting a nuclear counterattack. This approach legitimises investments in new generations of mobile ballistic missiles, the arming of a single missile with multiple nuclear payloads⁹⁴ and the development of means for circumventing advanced missile defence systems. China is particularly concerned by the progress made by the United States and Russia in the last of these areas, as well as in the area of high-precision strike capabilities. China has for a long time adhered to a 'no first use' (NFU) doctrine regarding nuclear weapons. It has thus declared that it will under no circumstances be the first to use a nuclear weapon and will not use or threaten nuclear weapons against non-nuclear-weapon states or in nuclear-weapon-free zones. According to some, the twofold declaration creates a certain ambiguity, but the Chinese leadership has so far refrained from giving any explanation or adding provisos.

Since 2015 China's military strategy has been designed to safeguard national sovereignty, preserve national unity (in relation to Taiwan and elsewhere), protect China's interests in new areas such as space and cyberspace and in overseas areas, and provide for strategic deterrence and a nuclear retaliation capability. The strategy is also intended to contribute to international security cooperation, internal stability,

92 CNBC, 'Putin claimed a new nuclear-powered missile had unlimited range — but it flew only 22 miles in its most successful test yet', 21 May 2018, <<https://www.cnbc.com/2018/05/21/russian-missile-with-unlimited-range-crashed-after-only-22-miles.html>>.

93 Kelsey Atherton, 'Russia hints at a nuclear armed drone submarine for 2027', C4ISRNET, 18 May 2018, <https://www.c4isrnet.com/unmanned/2018/05/18/russia-hints-at-a-nuclear-armed-drone-submarine-for-2027/?utm_source=Sailthru&utm_medium=email&utm_campaign=ebb%2021.05.18&utm_term=Editorial%20-%20Early%20Bird%20Brief>.

94 Multiple Independently-targetable Re-entry Vehicles (MIRVs).

assistance in the event of natural disasters and the protection of rights and trade.⁹⁵ China's general strategic stance can be described as 'active defence' aimed at stopping possible aggression by means of powerful counterattacks in order to achieve de-escalation and regain the initiative. The Chinese leadership promotes China's strategic interests assertively, but deliberately remains below the threshold of armed conflict with adversaries such as the United States and countries in the region. The most obvious example of this is the expansion of Chinese influence and territorial claims in the South and East China Seas. According to the military strategic guidelines, however, the Chinese armed forces must specifically prepare for maritime conflicts against a force in possession of advanced information technology.

Modernisation of nuclear arsenal

The modernisation of China's nuclear arsenal is part of a long-term and comprehensive programme of military modernisation and expansion designed to strengthen its ability to mount a forceful defence against all conceivable forms of aggression, deny adversaries access to certain areas (A2/AD) and project power beyond the national borders and adjacent waters. The reinforcements relate to conventional and nuclear capabilities, as well as the development of capabilities for defensive and offensive operations in the cyber domain, in outer space and in the electromagnetic spectrum. The Chinese leadership has set itself the goal of not being defeated in a conflict by adversaries who, for now at least, still have superiority in terms of high-grade military information and communication technology (especially the United States in the case of network-centric warfare). China wishes to lead the way in digitalisation and the application of artificial intelligence for defence purposes.⁹⁶ Its growing military capabilities are enabling it to consolidate its territorial claims in the South China Sea and deter attempts by Taiwan to loosen still further its ties with the mainland and claim *de jure* independence. China is investing in the steady build-up of a nuclear deterrence force consisting mainly of land-based ballistic missiles and ballistic missiles launched from strategic submarines. Both components are part of the missile forces and strategic support force established in 2016 to improve nuclear command and control. China's nuclear arsenal is being modernised and slowly expanded, but is more limited than that of the United States and Russia. For a summary of how the strategic triad is being modernised, see Annexe IV.⁹⁷

New focal points

In recent years China has deployed a new version of the DF-21A intermediate-range missile (range approximately 2,150km) to strengthen regional deterrence. The deployment consists of an estimated 40 mobile reloadable launchers. Lastly, China has introduced the DF-26, a new intermediate-range missile with a range of about 4,000km, which can be fired from mobile launchers. The missile can probably carry both conventional and nuclear warheads and is capable of reaching the US bases on Guam. The short-range land-based ballistic missiles are all equipped with a conventional

95 For the English version of the Chinese Military Strategy, see: <http://eng.mod.gov.cn/Press/2015-05/26/content_4586805.htm>.

96 Annual Report to Congress, 'Military and Security Developments Involving the People's Republic of China 2018', Office of the Secretary of Defense, 16 May 2018.

97 Complete overview of the Chinese nuclear weapons arsenal and modernisation programme: Hans M. Kristensen and Robert S. Norris, 'Chinese Nuclear Forces, 2018', *Bulletin of the Atomic Scientists*, 2018, Vol. 74, No. 4, pp. 289-295, <<https://www.tandfonline.com/doi/full/10.1080/00963402.2018.1486620>>.

payload, with the possible exception of one type (the DF-15).

Chinese military officials announced in 2016 that a new long-range strategic bomber was under development and would be introduced from the mid-2020s. Analysts view this announcement, coupled with the growing strategic role of the Chinese air forces since 2012, as a signal that China is aiming to have a complete and credible nuclear triad. However, reports indicating that China may well be developing dual-capable cruise missiles and ballistic missiles, partly for a possible nuclear role for the long-distance bombers, remain as yet unconfirmed.⁹⁸

Modernisation efforts are designed to minimise the possibility that an adversary could disable or disrupt Chinese retaliatory capabilities in the nuclear sphere. This involves installing ballistic missiles on mobile launch systems and making them hard to intercept, as well as improving China's own early warning and detection systems so that an attack is always detected and a response can be mounted in time. China's progress in the field of space-based capabilities and artificial intelligence creates new opportunities in this area, but may also introduce new risks.⁹⁹

III.2 The US modernisation programme

Role of nuclear weapons in US military strategy

The primary aim of US nuclear strategy and planning is to prevent potential adversaries from carrying out a nuclear attack on any scale whatever. In addition, its nuclear weapons are intended to help deter non-nuclear attacks, protect allies and partners and secure strategic goals if deterrence should fail or unforeseen contingencies occur.¹⁰⁰ To this end, the United States has developed a counterforce strategy and an integrated strategic operational plan for the armed forces which provide for flexible strategic and regional deployment options in multiple scenarios against a variety of potential adversaries. The United States is holding exercises to prepare for such scenarios, to test both the readiness of the strategic nuclear forces and nuclear command-and-control facilities, as well as (within NATO) the readiness of the DCA. US nuclear strategy is also geared to preventing the further proliferation of nuclear weapons and stopping terrorists from gaining access to nuclear weapons, knowledge and equipment.

The updated NPR shows that nuclear weapons represent a unique deterrent capability for the United States that is as relevant as ever. According to this document, US policy has never been based on 'no first use', and it is deliberately ambiguous when it comes to the circumstances in which the use of nuclear weapons will be contemplated, saying it would be only 'in the most extreme circumstances'. Unlike in the past, 'significant non-nuclear strategic attacks' are also emphasised as a possible reason for using nuclear weapons. Such attacks include, but are not limited to, 'attacks on the U.S., allied, or

98 Hans M. Kristensen and Robert S. Norris, 'Chinese Nuclear Forces, 2018', *Bulletin of the Atomic Scientists*, 2018, Vol. 74, No. 4, pp. 289-295, <<https://www.tandfonline.com/doi/full/10.1080/00963402.2018.1486620>>.

99 Lora Saalman, 'Fear of false negatives: AI and China's nuclear posture', 24 April 2018, <<https://thebulletin.org/military-applications-artificial-intelligence/fear-false-negatives-ai-and-china%E2%80%99s-nuclear-posture>>.

100 2018 U.S. Nuclear Posture Review, February 2018, pp. VII-IX.

partner civilian population or infrastructure, and attacks on U.S. or allied nuclear forces, their command and control, or warning and attack assessment capabilities'.¹⁰¹ Given the degree of attention paid by the NPR to offensive cyberattacks and threats in outer space, it seems likely that the function of nuclear deterrence is seen by the US as extending to preventing aggression in these relatively new areas. Despite the finding that nuclear weapons seem to be playing a greater role in its deterrence posture, it can also be concluded that the United States wishes to send a strong signal to adversaries that it will not tolerate any expansion of the possibilities for deliberately undermining and manipulating essential parts of its nuclear deterrent, through cyber operations or otherwise. The non-peaceful application of relatively new technologies, mainly by China and Russia, is fuelling US concerns about this.

Although the specified strategic objectives have remained unchanged for a long time, there is a striking difference in tone and prioritisation between the 2010 NPR and the NPR of February 2018. In the 2010 NPR the focus was on preventing nuclear dangers and proliferation and trying to achieve a world without nuclear weapons. The New START Treaty was seen as a first step towards more far-reaching nuclear arms control initiatives, for example in relation to sub-strategic nuclear weapons. The Obama administration wished to reduce the role of nuclear weapons, where possible scale back its own arsenal still further and refrain from further developing the most destructive weapons such as intercontinental missiles equipped with multiple nuclear warheads. By contrast, the 2018 NPR states that, in view of the deteriorating security situation and growing rivalry between the major powers, the United States can no longer afford to further reduce its nuclear arsenal or postpone decisions on replacement and modernisation investments. For example, the NPR points out that while the United States itself has reduced the role of nuclear weapons, other nuclear-weapon states, including Russia and China, have endeavoured to do the opposite. The United States needs to modernise its nuclear forces so that it can continue from a position of strength to pursue a differentiated and credible deterrent strategy to counter the various threats it faces (Russia, China, North Korea, Iran and nuclear terrorism). In his preface to the 2018 NPR, Secretary of Defence James Mattis stresses that the United States remains committed to the agreements in the field of nuclear arms control and non-proliferation, but recognises that further progress towards nuclear disarmament in the near future will be 'extremely challenging'.¹⁰²

Modernisation of nuclear arsenal

In recent years, the United States has drawn up plans for the comprehensive modernisation of its nuclear forces, including not only the weapons but also the means of delivery and production and command-and-control facilities. The 2018 NPR confirms the picture that the US government wishes to speed up implementation of the modernisation programme, which was drawn up under previous administrations and has now been supplemented with some new elements. The programme has a term of 30 years, and its costs for the period 2017-2026 have been estimated by the Congressional Budget Office at 400 billion US dollars. Over the entire term from 2017 to 2046 the costs of the programme could rise to 1,200 billion US dollars if all the plans are implemented.¹⁰³

101 Ibid., p. 21.

102 Ibid., p. III.

103 Congressional Budget Office, 'Projected Costs of US Nuclear Forces, 2017 to 2026', February 2017. See: <<https://www.cbo.gov/publication/52401>>.

According to the NPR, the efforts are aimed at sustaining and future-proofing the US nuclear deterrent (within the scope of the agreements under the nuclear arms control treaties), consisting of the strategic nuclear triad, supported by NATO dual-capable aircraft (DCA) and a robust nuclear command-and-control system.¹⁰⁴ For a summary of how the strategic triad is being modernised, see Annexe IV.¹⁰⁵

Besides modernising the nuclear triad, the United States intends to implement the life extension programme (LEP) of the B61 gravity bomb, as initiated by the previous administration, thereby making it compatible with the F-35 platform.¹⁰⁶ The lifetime extension of the current B61, which dates from the 1960s and is the oldest nuclear weapon in the active stockpile, is necessary because its safety, reliability and effectiveness are being compromised by its age. The LEP provides for the replacement of four of the five current variants of the B61 by a single new variant, the B61-12, from 2020 onwards.¹⁰⁷ The LEP applies modern technology, which improves safety, enhances maintenance efficiency and ensures that the weapon can continue to play its role in nuclear deterrence.¹⁰⁸ The NPR says in this connection: 'We will work with NATO to best ensure – and improve where needed – the readiness, survivability, and operational effectiveness of DCA based in Europe'.¹⁰⁹ The B61-12, like the existing B61 variants, will be a gravity bomb, although it will have the option of manoeuvrable tail fins to improve its accuracy. The F-35 will have the digital interface required for this purpose.¹¹⁰ Some critics point out that the new tail kit means that the B61-12 could be used strategically but could also lower the threshold if used at a low-yield setting. In their view, this would therefore give a new meaning to 'extended deterrence' in Europe.¹¹¹ A number of important points should be made here. The lowest yield setting will remain the same after modernisation, so there will be no undesirable 'miniaturisation' (no reintroduction of battlefield

104 2018 U.S. Nuclear Posture Review, February 2018, pp. III.

105 Complete overview of the US nuclear arsenal and modernisation programme: Hans M. Kristensen and Robert S. Norris, 'United States Nuclear Forces, 2018', *Bulletin of the Atomic Scientists*, 74:2, pp. 120-131, <<https://doi.org/10.1080/00963402.2018.1438219>>.

106 The development engineering of the B61-12 LEP started in February 2012. According to the 2018 Nuclear Posture Review, the B61-12 will be available from 2020 and in the DCA countries from 2021. 2018 Nuclear Posture Review, pp. 47-48.

107 The B61-11 is not part of the B61 LEP. This variant is exclusively intended to destroy underground targets (which are by their nature extra well-protected and hard to reach). The B61-12 is not designed to have earth-penetrating capacity of this kind.

108 National Nuclear Security Administration Fact Sheet, B61-12 Life Extension Program, <<https://www.energy.gov/sites/prod/files/2018/12/f58/B61-12%20LEP%20factsheet.pdf>>.

109 2018 U.S. Nuclear Posture Review, p. 54.

110 US Government Accountability Office, Report to the Committee on Armed Forces, U.S. Senate (GAO-18-456), 'B61-12 Nuclear Bomb. Cost Estimation for Life Extension, Incorporated Best Practices, and Steps Being Taken to Manage Remaining Program Risks', May 2018.

111 See: <<https://nationalinterest.org/blog/buzz/air-force-stealth-b-2-spirit-just-test-dropped-nuclear-bomb-29547>>.

weapons).¹¹² Although it will be possible to use the B61-12 for strategic missions of the B-2 (and, in due course, B-21) bombers, this does not mean that the B61 is being given a broader range of tasks (heavier B61 variants have already been assigned to the B-2). Nor is it intended that the DCA in Europe should take over strategic missions of this kind. The AIV would note here that no modification of the current nuclear task/mission of the Dutch F-16s is foreseen. From the information it has obtained after making inquiries with NATO (including the Nuclear Planning Group) and with officials of the United States and the other DCA countries, the AIV concludes that things will be no different once the F-35 and the B61-12 have been introduced. The AIV also believes that the task/mission must always determine the choice of weapon (or variant of weapon), and not the other way around. The nuclear task/mission is embedded in the NATO strategy, which emphasises the need to prevent a situation ever occurring in which the use of nuclear weapons has to be contemplated. This can be the only acceptable, legitimate reason for maintaining credible nuclear deterrence.

New focal points

The 2018 NPR announced that a small number of submarine-launched strategic missiles would be equipped with a relatively low-yield warhead and that in the longer term a new sea-launched cruise missile (SLCM) would be developed. Although the new SLCM may perhaps not be a complete novelty, it can be regarded as a striking reconsideration of the decision by the previous administration in 2010 to abolish the sea-launched nuclear Tomahawk Land Attack Missile (TLAM/N). These new – and immediately controversial – measures are intended as ‘limited’ nuclear options in addition to the dual-capable aircraft (DCA), which are to date the sole sub-strategic option. This also provides a degree of flexibility, as the weapons can be deployed worldwide without having to operate from allied territory and it is virtually certain that they can penetrate an adversary’s air defence. It seems right to consider how this will affect the role of European NATO countries in deterrence. Any assessment of the new measures must also take into account whether their most likely effect will not be to increase feelings of insecurity among potential adversaries, thereby actually undermining stability (the classic security dilemma). The United States already has a variety of nuclear capabilities at its disposal. It is therefore worth asking why the United States considers it necessary to add low-yield nuclear weapons to increase its sub-strategic options.¹¹³ Critics point out that the United States already has low-yield nuclear weapons and that adding this option will not really strengthen deterrence and may even lower the threshold for the use of nuclear weapons.¹¹⁴

Although this is certainly not the United States’ intention, its measures to increase flexibility could give the impression that in response to the assumed evolution of Russian doctrine and the introduction of new capabilities, the United States is also considering limited, early use of smaller nuclear weapons. In fact, the NPR argues that

112 The destructive yield of the B61-12 will vary between 0.3kt and 50kt, in keeping with the existing B61 variant with the lowest kt values (the B61-4). See B61-LEP project information, <<https://www.airforce-technology.com/projects/b61-12-nuclear-bomb/>>.

113 See, for example, the *Washington Post*’s editorial on the NPT: ‘An unnecessary nuclear detour’, 4 February 2018, and Dick Zandee and Sico van der Meer, ‘Trump’s Nuclear Posture Review: A New Rift between Europe and the US?’, Clingendael Policy Brief, February 2018.

114 See: <<http://foreignpolicy.com/2017/09/21/why-donald-trump-wants-his-nukes-to-be-smaller/>>.

an additional lower-yield option would strengthen deterrence (at relatively low cost), because it is a response to any dangerous mistaken perception by other nuclear-weapon states (i.e. Russia and possibly also China) that an 'exploitable gap' has occurred in US regional deterrence capabilities. The perceived gap relates to the lack of nuclear options as a step between the existing sub-strategic nuclear weapons (the DCA) and the strategic triad, which might mean that the United States is itself deterred ('self-deterred') from using nuclear weapons, which would detract from the credibility of the deterrent. Moreover, the development of a new SLCM and its planned introduction in the longer term is intended as a response to Russia's violation of the INF Treaty (with the 9M729). Commenting on the NPR, former US Secretary of Defence James Mattis emphasised that this measure could be regarded as a bargaining chip in negotiations in order to increase the pressure on Russia to comply with the INF treaty and to create room for strategic arms control consultations with Moscow and Beijing.¹¹⁵ The announcement in the NPR of a study of US options for a new ground-launched intermediate-range missile system seems similarly intended as an incentive.¹¹⁶

III.3 'Entanglement' of nuclear and non-nuclear capabilities and technologies

Concerns about the blurring of the dividing line between nuclear and conventional weapons have existed since the Cold War. An example is 'miniaturisation', a concept that encompasses a variety of developments to refine and reduce the size of nuclear weapons and make them more precise and technically easier to use. Although nuclear weapons with very low yield values, developed for use on the battlefield (nuclear battlefield weapons), would limit explosive damage and radiation, they might also lower the nuclear threshold. The former 'West' has eliminated nuclear battlefield weapons (see Annexe II), but there is reason to believe that Russia still has a variety of nuclear weapons of this kind.

Experts say the risk of crisis instability is currently increasing due to rapid developments in different, interacting domains of military operations. This has been referred to for some time now as 'entanglement'.¹¹⁷ As a result of the increased interconnectedness and mutual dependency of nuclear and non-nuclear systems, in the event of rising tensions there is a risk of – nuclear – overreaction, because nuclear-weapon states do not want to lose their retaliation capability and would prefer to be able to regain the

115 See: <https://www.washingtonpost.com/world/national-security/mattis-plans-for-new-us-nuclear-weapon-could-be-bargaining-chip-with-russia/2018/02/06/198a6d14-0b68-11e8-baf5-e629fc1cd21e_story.html?utm_term=.fb55c9487ec1>.

116 2018 U.S. Nuclear Posture Review, February 2018, p. 10.

117 James M. Acton, 'Why is Nuclear Entanglement so Dangerous', Carnegie Endowment for International Peace, 23 January 2019. See: <https://carnegieendowment.org/2019/01/23/why-is-nuclear-entanglement-so-dangerous-pub-78136?utm_source=carnegieemail&utm_medium=email&utm_campaign=announcement&mkt_tok=eyJpIjojTURObU1qVXpaRGhoWW10ailsInQiOiJ4V3JCZUxWdk9SV EVsMjI0SnNuMmFSVDZtbEVyS1RQNXhdDWVhub29SVnk4ZVhjOTNXaHg5SldLa2tjNHIMcTY-5SIBhNGZ6bWtXaUFxN3I1Z2FXa09ISkdoWGo5bTUwN3RcL3ZiYipkTHNXcmRQNIXiQVUNpUWw1Q1px-cG1NSTZqRE4ifQ%3D%3D>.

initiative.¹¹⁸ This is due to various developments. The problem of dual-use weapon systems and the integration of nuclear forces into regular military units has existed for decades, making it more difficult to establish whether there are nuclear intentions, capabilities and preparations for actual use. This is increasingly due to the vulnerability of highly digitised and networked systems for command, control, communications and information (C3I)¹¹⁹ as well as to offensive weapons that are hard to detect and identify at an early stage. These factors influence the strategic considerations of nuclear-weapon states. A number of developments require further consideration, in part due to the tough questions they pose in terms of arms control and risk reduction (see chapter IV.2).

Arming intercontinental missiles with a conventional payload can distort strategic relations and increase the risk of a nuclear counterattack. This is because a country that is under attack can no longer distinguish between conventional or nuclear offensive weapons, or can only do so when it is much too late. Plans to arm existing intercontinental missiles (which are also used for nuclear missions) and submarine-launched missiles with conventional payloads fall under the United States' conventional prompt global strike (CPGS) efforts. This capability would enable the United States to strike targets anywhere in the world within one hour,¹²⁰ allowing it, for example, to counterbalance the increased threat of intermediate-range missiles to its regional presence, which several years ago prompted John Bolton, now the US National Security Adviser, to call the INF Treaty into question.¹²¹ It should be noted here that conventional weapons may possibly never be an alternative to nuclear weapons. According to a publication of the Center for Strategic and International Studies (CSIS), the lowest kiloton value in the nuclear arsenal of the United States and NATO is 0.3kt or 300 tons. By contrast, the heaviest conventional weapon of the United States is now the 'massive ordnance penetrator' (MOP), which has a yield of about 3 tons and is designed for use against underground bunkers.¹²² Russia has even heavier conventional bombs.

According to General John E. Hyten, commander of U.S. Strategic Command, the development of new hypersonic weapons could ultimately undermine the principles of

118 James N. Miller, Jr. and Richard Fontaine, 'A New Era in U.S.-Russian Strategic Stability. How Changing Geopolitics and Emerging Technologies are Reshaping Pathways to Crisis and Conflict', September 2017.

119 James M. Acton, Alexey Arbatov, Vladimir Dvorkin, Petr Topychkanov, Tong Zhao and Li Bin, 'Entanglement: Chinese and Russian Perspectives on Non-nuclear Weapons and Nuclear Risks', 8 November 2017, <<http://carnegieendowment.org/2017/11/08/entanglement-chinese-and-russian-perspectives-on-non-nuclear-weapons-and-nuclear-risks-pub-73162>>.

120 Congressional Research Service, Amy F. Woolf, 'Conventional Prompt Global Strike and Long-Range Ballistic Missiles: Background and Issues', 6 April 2018; <<https://fas.org/sgp/crs/nuke/R41464.pdf>>.

121 John Bolton and John Yoo, 'An Obsolete Nuclear Treaty Even Before Russia Cheated', *Wall Street Journal*, 9 September 2014, <<https://www.wsj.com/articles/john-bolton-and-john-yoo-an-obsolete-nuclear-treaty-even-before-russia-cheated-1410304847>>.

122 CSIS, Project Atom, May 2015, p. 20, Table 1. See also: NTI, 'Building a Safe, Secure, and Credible NATO Nuclear Posture', January 2018, p. 24.

mutual assured destruction.¹²³ Russia and possibly China too may currently be ahead of the United States in this area.¹²⁴ Due to their speed,¹²⁵ manoeuvrability and non-ballistic flight trajectory, these projectiles follow a very unpredictable flight pattern, right up to the final stage. This vastly reduces the response times compared with 'ordinary' ballistic and cruise missiles, making such systems extremely difficult to intercept, even for the most advanced missile defence systems. The weapons' high speed and great precision can destroy hardened, underground military targets using a relatively limited payload. The introduction of these systems would increase the risk of a 'disarming attack', particularly for states that possess a relatively limited strategic nuclear capability. Such a threat may encourage nuclear-weapon states to raise the readiness levels of their nuclear forces (launch on warning posture) and delegate the authority to launch an attack to lower levels in the chain of command, to safeguard their second-strike capability.¹²⁶

Russia appears to be increasingly militarising space: it is actively developing anti-satellite (ASAT) weapons, including powerful mobile laser weapons, and has placed assets in space that display 'abnormal behaviour'.¹²⁷ In 2007 China also demonstrated its ASAT capability,¹²⁸ and it is likely to have developed this capability further since then. The US government recently announced it would restructure and strengthen its space programme.¹²⁹ The vulnerability of Command, Control, Communications and Information (C3I) systems, which have become increasingly dependent on assets in space, gives cause for concern. These systems are a pivotal part not only of conventional military operations, but also of detection and early-warning capability in the event of a nuclear attack and hence of the ability to mount a retaliatory nuclear strike.¹³⁰ The risk of uncontrollable escalation is high, because during crises and rising tensions between the

123 Travis J. Tritten, 'Nuclear weapons chief: Doctrine of "mutually assured destruction" is good for another 10 years', *Washington Examiner*, 7 March 2018.

124 Michael Evans, 'Need for speed: why the US is spending billions in a hypersonics arms race', *The Times*, 10 August 2018, <<https://www.thetimes.co.uk/article/need-for-speed-why-the-us-is-spending-billions-on-hypersonics-fr977p8jq>>.

125 Hypersonic speeds of these weapons are in excess of Mach 5 (between 5,000 and 25,000 kph).

126 Richard H. Speier, George Nacouzi, Carrie A. Lee, Richard M. Moore, 'Hypersonic Missile Nonproliferation. Hindering the Spread of a New Class of Weapons', RAND Corporation, 2017.

127 Stephanie Nebehay, 'U.S. warns on Russia's new space weapons', Reuters, 14 August 2018. See: <<https://www.reuters.com/article/us-russia-usa-space/us-warns-on-russias-new-space-weapons-idUSKBN1KZOT1>>.

128 Carin Zissis, 'China's Anti-Satellite Test', Council on Foreign Relations, 22 February 2007. See: <<https://www.cfr.org/backgrounders/chinas-anti-satellite-test>>.

129 President Trump's Space Policy Directive, 18 June 2018. See: <<https://www.newscientist.com/article/2171971-trump-has-directed-the-us-military-to-establish-a-space-force/>>.

130 James M. Acton, 'Escalation through Entanglement. How the Vulnerability of Command-and-Control Systems Raises the Risks of an Inadvertent Nuclear War', *International Security*, Vol. 43, No. 1 (Summer 2018), pp. 56–99.

United States and Russia, or between the United States and China, both adversaries may be tempted to degrade or attack the other's C3I system in order to disrupt its military operations. In 2016, President Barack Obama referred to communication disruption as a real danger.¹³¹ According to the Arms Control Association, cyberattacks on nuclear command-and-control systems can greatly increase instability in crisis situations.¹³²

In addition to offensive cyber capabilities,¹³³ the major powers (including the nuclear powers) also possess increasingly advanced assets for electronic warfare, and the manipulation, disruption or physical elimination of satellites.¹³⁴ These technologies make it possible to achieve a major impact without immediately causing casualties. What is more, it can be difficult to verify who carried out the attack. Such an action could, however, be interpreted as a precursor to a larger, possibly nuclear follow-up attack. This would necessitate a powerful pre-emptive attack, creating the risk of an overreaction and of the conflict getting out of hand.

A logical extension of this development is the use of artificial intelligence. Given the speed and complexity of these kinds of attack scenarios, it is conceivable that major nuclear powers will resort to autonomous decision-making systems, supported by specially developed digital algorithms. The use of artificial intelligence in the nuclear domain conjures up conflicting images: on the one hand, technical control through the gradual reduction and perhaps even elimination of the (slow and fallible) human factor throughout the entire decision chain to use lethal force and, on the other, the unintended and fatal effects of decisions delegated to artificial intelligence, which may be swift and irrevocable. That risk is not stopping the advance of artificial intelligence in the military field. A recent RAND study¹³⁵ concluded that nuclear destabilisation is potentially the most serious threat posed by artificial intelligence.

Experts believe there is a real chance that artificial intelligence will undermine countries' faith in the infallibility of their retaliation capabilities, and that they will thus come to consider themselves – rightly or wrongly – to be vulnerable to a first strike. Although this prospect might seem a long way off, they conclude that artificial intelligence may

131 At the conclusion of the Nuclear Security Summit (NSS) in Washington in 2016 President Obama argued that 'communication links between the weapons and their guardians needed better protections against cyberattack'. But when asked if warhead miniaturisation and similar improvements could undermine his record of progress on arms control, he replied, 'It's a legitimate question. And I am concerned'. In William J. Broad and David E. Sanger, 'Race for Latest Class of Nuclear Arms Threatens to Revive Cold War', *The New York Times*, 16 April 2016.

132 Daryl Kimball, in: <[https://www.economist.com/news/briefing/21741537-politics-and-technology-make-arms-control-harder-ever-old-deals-limit-nuclear-weapons?>](https://www.economist.com/news/briefing/21741537-politics-and-technology-make-arms-control-harder-ever-old-deals-limit-nuclear-weapons?).

133 Chatham House Research Paper, 'Cybersecurity of Nuclear Weapons Systems. Threats, Vulnerabilities and Consequences', January 2018.

134 Brian Weeden and Victoria Samson, 'Global Counterspace Capabilities: An Open Source Assessment', Secure World Foundation, April 2018.

135 Edward Geist and Andrew J. Lohn, 'How Might Artificial Intelligence Affect the Risk of Nuclear War', RAND Corporation, 2018.

significantly change thinking about nuclear stability. Artificial intelligence can potentially search millions of data items and images and detect and monitor enemy missiles that were previously 'hidden', providing earlier warning in the event of a launch. This would be a positive development. However, there is scepticism too about the scope for early and reliable detection of hidden nuclear-weapons programmes. A scenario in which artificial intelligence provides a greater ability to pre-emptively eliminate offensive nuclear weapons could have a destabilising effect. The United States, China and Russia already appear to be competing in this area.¹³⁶

136 Elsa B. Kania, 'Battlefield Singularity: Artificial Intelligence, Military Revolution, and China's Future Military Power', Center for a New American Security, November 2017. See: <<https://www.cnas.org/publications/reports/battlefield-singularity-artificial-intelligence-military-revolution-and-chinas-future-military-power>>.

IV Nuclear arms control under pressure

IV.1 Importance of nuclear arms control

Nuclear arms control is going through a difficult period.¹³⁷ But the same has been said on a good many occasions during its 50-year history. This pessimism is the prevailing attitude among experts who believe that relations between Russia and the United States are crucial to the success of nuclear arms control. According to this view, the current negative political climate leaves little room for promising arms control initiatives, let alone successful results. There is also a more qualified, optimistic school of thought. Paradoxically, arms control in post-war East-West history has sometimes been surprisingly successful. In some ways, this is comparable to an anti-cyclical budgetary policy in an economic downturn: in other words, providing hope and inspiration or even serving as a boost in difficult times.

Arms control is more than about keeping a grip on the arms race, which is an obviously useful but intrinsically complicated task. From experience it is clear that arms control also fulfils other functions in diplomatic relations. Arms control entails dialogue and the making of agreements, which necessitate verification mechanisms. The resulting contacts between adversaries can set norms, provide procedural certainty and create realistic expectations for each party: a positive side-effect that undeniably promotes stability. A professional sense of community and trust can even grow between scientific, military and diplomatic representatives of adversaries, which can help to defuse crises if it can be invoked in times of incidents and tension. Positive experiences in this area can serve as an example and be conducive to conflict resolution in non-military matters such as trade, human rights and the management of the global commons. Conversely, lack of communication and cooperation can lead to uncertainty and a sense of insecurity, allowing miscommunication, incidents and a lack of understanding to give rise to deep-rooted mistrust and crises that are difficult to control.

However, arms control can succeed only if an essential condition is met: there must be prior recognition of a community of interests and consequently no confusion or serious difference of opinion about the goal to be achieved. Over 50 years of arms control has shown that 'strategic stability' is a goal that is hard to define but workable. Arms control has little chance of success if it cannot rely on that fundamental consensus. A number of treaties that are important for nuclear arms control are at risk of non-compliance or non-extension on expiry. Of direct importance to Europe, and thus to the Netherlands, is compliance with the Intermediate-Range Nuclear Forces (INF) Treaty signed in 1987. Indirectly bound up with this is the fate of the New START Treaty which expires in 2021, and the future of the Non-Proliferation Treaty dating from 1970 also requires consideration. At individual country level, Iran and a number of non-NPT signatories (Israel, Pakistan, India and North Korea) have nuclear programmes that are relevant in regard to regional and global nuclear arms control, but are very difficult to contain. These

137 Nina Werkhäuser, 'SIPRI: Nuclear weapons are still being developed', DW, June 2018 refers to an interview with Shannon Kile: 'When important disarmament agreements like the New START Treaty expire in the coming years, nuclear weapons experts fear that new treaties may not be made to replace them. There would then be no contractual limitations whatsoever on weapons arsenals. "We are clearly moving away from Barack Obama's 2009 vision of a nuclear-free world," says Kile.

uncertainties raise the question of whether the treaties themselves are failing and becoming obsolete, or whether the fundamental consensus on which they are based is eroding.

IV.2 Obstacles and uncertainties

Strategic developments

The doctrine of mutual assured destruction (MAD) formed the basis for a series of treaties that guaranteed survival of MAD capabilities. Neither side was permitted to develop a first-strike capability that could disable or eliminate the adversary's retaliatory capability. This was deemed to include defensive systems that help to resist a counterattack. Although a break-out was theoretically possible, the norm was that both parties accepted their own vulnerability as a sine qua non for strategic stability. Once the Cold War was over and the danger of a confrontation between the nuclear superpowers was considered purely theoretical, the priority of the United States shifted to nuclear threats from emerging countries and non-state terrorist actors, threats that were thought to be small but real. The United States unilaterally withdrew from the Anti-Ballistic Missile (ABM) Treaty in 2002, thus providing scope for the development and deployment of ballistic missile defence (BMD) systems. Together with conventional and nuclear capabilities, BMD has become part of the defence and deterrence policies of the United States and NATO.

The BMD systems of the United States and its allies do not form an impenetrable 'shield' against which the Russian triad stands no chance. The systems are said to be intended as a defence against one or more missiles from a country such as Iran or North Korea. According to Russia, the development of BMD systems nonetheless undermines the MAD doctrine and their deployment is already upsetting the regional military balance. Russia views this as a reason for giving priority to developing hypersonic weapons capable of penetrating the missile defence. The United States in turn recognises vulnerabilities in the protection of its own territory and that of its allies due to the proliferation of missile technology and the development and deployment of advanced dual-capable ballistic and cruise missiles by potential adversaries, including Russia.

INF Treaty

The INF treaty, signed by the leaders of the United States and the Soviet Union in 1987, led to the end of the crisis in the 1980s, when the Soviet Union had deployed mobile SS-20 missiles in the European part of Russia that were aimed at targets in Western Europe. European NATO members had asked the United States for a protective countermeasure. NATO then took the 'double-track decision' in 1979: the Soviet Union was asked to remove these weapons, failing which comparable weapons, namely Pershing and cruise missiles, would be aimed at the Soviet Union from Western Europe. Forty-eight cruise missiles were to be stationed in the Netherlands, about which Dutch parliament would long remain divided. These intermediate-range weapons would increase the threat to the Soviet Union. Ultimately these weapons were not deployed in Europe, as Soviet leader Mikhail Gorbachev and US President Ronald Reagan concluded the INF Treaty. In the intervening decades the United States and the Soviet Union (later Russia) have refrained from developing and deploying ground-launched ballistic and cruise missiles with a range of between 500 and 5,500km, which are prohibited by the treaty.

About 10 years ago, suspicions began to surface that Russia was violating the INF

Treaty.¹³⁸ This was officially raised by the US administration in its annual arms control report from 2014 onwards. In turn, Russia has accused the United States of breaching the treaty. Formally, the United States has reported on this violation by Russia in its compliance reports since 2014-2017. In reports from the Department of State (entitled 'Adherence to and Compliance with Arms Control, Nonproliferation and Disarmament Agreements and Commitments'), the United States has stated that 'the Russian Federation is in violation of its obligations under the INF Treaty not to possess, produce, or flight-test a ground-launched cruise missile (GLCM) with a range capability of 500km to 5,500km, or to possess or produce launchers of such missiles.'

In February 2017 articles appeared in the press reporting that the missile in question was the 9M729, which was originally a Kalibr sea-launched cruise missile that had been converted to a prohibited land-based version. Russia has denied the violations and made counter-accusations (see chapter III.1).¹³⁹ Experts argue that it should be technically possible to verify the allegations and resolve them in the INF Special Verification Commission (SVC), which reconvened in November 2016 after a 13-year break. This meeting, and a further meeting in December 2017 yielded no result. There are also reasons to view the future of the INF from a broader perspective than the violation issue alone. Ian Anthony, for example, thinks, 'it is not unreasonable to ask whether a 30-year-old instrument, created in circumstances that no longer exist, is still in tune with current needs'.¹⁴⁰ Kevin Ryan's analysis is that the INF Treaty has no future.¹⁴¹

On 22 October 2018, US National Security Adviser John Bolton confirmed in Moscow the intention previously expressed by President Donald Trump to withdraw from the INF Treaty. The United States notes that the INF Treaty is no longer fit for purpose: first, because the fact that Russia has been violating the INF obligations with impunity creates an untenable situation and, second, because China is not a party and is developing short- and intermediate-range missiles unchecked. The denunciation of the treaty can be seen as a 'gift' for Russia, which had itself criticised the treaty for years and did not wish to talk about the presumed violation unless other points of contention were also discussed, but did not itself take the decision to withdraw. As early as February 2007, President Putin stated that the INF Treaty no longer served Russia's interests as it stood in the way of an adequate response to new strategic challenges posed by the emerging power of China and other countries bordering Russia.

138 For an overview, see: Amy F. Woolf, 'Russian Compliance with the Intermediate Range Nuclear Forces (INF) Treaty: Background and Issues for Congress', Congressional Research Service, 29 October 2018.

139 For the official US response to the Russian accusation, see: <<https://www.state.gov/t/avc/rls/2017/276360.htm>>. The fact that a sum of 58 million US dollars has been reserved in the US defence budget for the 2018 financial year for a research and development programme for a dual-capable, road-mobile, ground-launched missile system with a maximum range of 5,500km is not a treaty violation, but is nonetheless regarded with suspicion by Russia.

140 Ian Anthony (2017), 'European Security after the INF Treaty,' (2017) in: *Survival*, 59:6, see: <<https://doi.org/10.1080/00396338.2017.1399728>>.

141 Kevin Ryan, 'After the INF Treaty: An Objective Look at US and Russian Compliance, Plus a New Arms Control Regime', 7 December 2017. See: <<https://www.russiamatters.org/analysis/after-inf-treaty-objective-look-us-and-russian-compliance-plus-new-arms-control-regime>>.

The leaders of the NATO countries declared at the NATO summit in July 2018 that 'the most plausible assessment would be that Russia is in violation of the Treaty.' According to NATO's Secretary-General, Russia has already acknowledged the existence of the 9M729 missile system, and there is sufficient evidence that it is undermining the INF Treaty by developing and deploying this weapon.¹⁴² He said that although the implications of this are still being assessed, he does not expect it to result in more nuclear weapons being stationed in European countries.¹⁴³ The Dutch government too has announced that it is able to confirm independently from its own intelligence that Russia has developed and is currently introducing this new missile, which has a range of more than 500km, which is prohibited under the INF Treaty. After calling on Russia to return to verifiable compliance, of the treaty as quickly as possible, the Dutch government notes that if Russia continues to undermine the INF Treaty, the Netherlands and NATO Allies will have to consider further steps – both in military terms and in the area of arms control.¹⁴⁴ At the NATO summit on 4 and 5 December 2018, the NATO member countries issued a joint statement endorsing the US position that a situation in which the United States fully abides by the INF Treaty and Russia does not is not sustainable and that Russia must return to full and verifiable compliance.¹⁴⁵ On 4 December 2018 the United States declared that Russia had 60 days in which to show that it is in compliance and intends to remain in compliance with the provisions of the INF Treaty.¹⁴⁶ Withdrawal from the treaty formally takes effect six months after notification of the decision to withdraw from or suspend the treaty unilaterally. The consequences of a definitive US withdrawal from the INF Treaty will be felt in Europe and Asia and may give rise to new tensions or even an arms race.

Russia's modernisation of its nuclear arsenal has reached an advanced stage and in recent years it has deployed a qualitatively and quantitatively impressive nuclear and dual-use capability, for example in Crimea and Kaliningrad, which poses a direct threat to Europe. In Kaliningrad Russia is now expanding its storage facilities for nuclear weapons. Even if the INF Treaty were to be saved, this does not mean that the threat will disappear. The question that now arises is whether, if Russia ultimately does not comply with the urgent request by the United States and the other NATO

142 See: <<https://www.politico.eu/article/nato-jens-stoltenberg-accuses-russia-of-violating-nuclear-treaty/>>.

143 See: <https://www.reuters.com/article/us-usa-nuclear-nato/no-new-nuclear-arms-in-europe-despite-russian-treaty-breach-nato-idUSKCN1MY0T4?utm_source=Saithru&utm_medium=email&utm_campaign=ebb%2010-24&utm_term=Editorial%20-%20Early%20Bird%20Brief>.

144 Letter from the Minister of Foreign Affairs and the Minister of Defence to the House of Representatives on the Netherlands' conclusion concerning Russia's violation of the INF Treaty, DVB/NW-130/2018, 27 November 2018. See: <<https://www.rijksoverheid.nl/binaries/rijksoverheid/documenten/kamerstukken/2018/11/27/kamerbrief-nederlandse-conclusie-over-de-russische-schending-van-het-inf-verdrag-intermediate-range-nuclear-forces/kamerbrief-nederlandse-conclusie-over-de-russische-schending-van-het-inf-verdrag-intermediate-range-nuclear-forces.pdf>>.

145 Letter from the Minister of Foreign Affairs to the House of Representatives reporting on the meeting of NATO foreign ministers on 4-5 December 2018, BZDOC-9715814-2312, December 2018, enclosing the joint statement.

146 See: <<https://breakingdefense.com/2018/12/us-gives-russia-60-days-before-inf-withdrawal-nato-comes-around/>>.

member countries to return to full and verifiable compliance, NATO should also consider stationing intermediate-range missiles or other nuclear or conventional weapons in Europe. NATO's Secretary-General has announced that the stationing of nuclear missile systems in Europe is unlikely. The German foreign minister has spoken out against stationing intermediate-range missiles either in Germany or elsewhere in Europe.¹⁴⁷ The AIV believes that from the European point of view it will be easier to gain support for countermeasures in other areas such as missile defence, tighter sanctions and amendments to the treaty (for instance, limiting its geographical scope to Europe and the European part of Russia, or expanding the treaty to include China and other countries).

Extension of New START

A failure of the negotiations on compliance with the INF Treaty may have a knock-on effect on the talks to extend the Treaty on Measures for the Further Reduction and Limitation of Strategic Offensive Arms (New START) after 2021.¹⁴⁸ Russia and the United States have already complied with the limits set in the 2010 New START Treaty, but it is due to expire in February 2021 if no action is taken. Russia is expected to want to extend New START, even if the INF Treaty is denounced by the United States. By contrast, the United States may not wish to extend New START because, in view of the changing geopolitical context, it sees no point in further reducing or freezing the strategic part of its nuclear arsenal. Current National Security Adviser John Bolton is not known as a supporter of New START, which he has described as 'unilateral disarmament'.¹⁴⁹ The NPR, published in early 2018, stresses that the United States remains committed to compliance with New START and the other arms control treaties to which it is party,¹⁵⁰ but no formal statement about extension from 2021 onwards has yet been issued. The verification procedures and regular contacts laid down in the treaty (the 'interactive procedure') would be lost in the event of non-extension. Some people believe that if New START is not extended, this would mark an ominous beginning of a lengthy period without arms control, which would also have consequences for Europe.¹⁵¹

147 See: <<https://www.handelsblatt.com/politik/deutschland/inf-vertrag-maas-sagt-widerstand-gegen-neue-atomare-aufrestung-voraus/23798814.html?ticket=ST-2621649-3RzraEPbQT4BTDWSYQPN-ap4>>.

148 The New START Treaty concluded by former presidents Barack Obama and Dmitri Medvedev entered into force in February 2011. Under this treaty, the strategic nuclear weapons of the United States and Russia are to be limited within 10 years to 1,550 nuclear warheads and 800 launchers, only 700 of which may be operational, for each party. The treaty does not contain any agreements on the reduction of sub-strategic nuclear weapons or of stockpiled (non-deployed) nuclear weapons.

149 *Wall Street Journal*, <<https://www.wsj.com/articles/SB10001424052748703618504575459511831427690>>.

150 NPR Fact Sheet 2018 'Reducing Nuclear Dangers', see: <<https://media.defense.gov/2018/Feb/02/2001872881/-1/-1/1/REDUCING-NUCLEAR-DANGERS.PDF>>. Passage about arms control: 'The United States remains committed to its arms control obligations under New START and other arms control treaties to which it is party.'

151 Eugene Rumer, 'A Farewell to Arms ... Control', Carnegie Endowment for International Peace, 17 April 2018. 'Should New START be allowed to expire, the United States and Russia would lose the only remaining bilateral arms control agreement that both sides have complied with and have not accused each other of violating.'

Future of the NPT

The aim of the Non-Proliferation Treaty (NPT), which has been regarded as the cornerstone of the global regime for nuclear non-proliferation and disarmament since 1970, is to stop the spread of nuclear weapons.¹⁵² Ultimately they should be negotiated away under Article VI of the treaty. But the NPT is not entirely universal (191 states are parties to it). Four of the five non-members, namely North Korea, India, Pakistan and Israel, are also de facto nuclear-weapon states. The negotiations on complete disarmament that are ultimately intended to lead to elimination of nuclear weapons have undeniably borne little fruit. The NPT was extended indefinitely in 1995 and is now reviewed every five years in a review conference. The treaty discriminates between 'haves' and 'have-nots', and the aim is to eliminate this difference in due course by obliging the 'haves' to negotiate in good faith about the elimination of nuclear weapons, while the 'have-nots' are explicitly entitled to support from the 'haves' in using nuclear energy for civilian purposes. This reciprocal obligation is laid down in Article V of the NPT.¹⁵³ On balance, the NPT has so far been a success because only a few new nuclear-weapon states have emerged. A substantial number of countries have abandoned their aspirations. The main threat to the future of the NPT is that the recognised nuclear-weapon states are not complying with their Article V obligations or with the promises and agreements made at successive review conferences.

The NPT is being eroded at country level by two developments: (1) the possible withdrawal of countries that are currently parties to the NPT, and (2) the semi-recognition of countries that have de facto nuclear-weapon status but are not parties to the NPT. Without going into this in too much detail, the recent withdrawal by the United States from the Joint Comprehensive Plan Of Action (JCPOA) with Iran may prompt Iran to reconsider its NPT membership (1).¹⁵⁴ The fluctuating views of President Trump about the possession of nuclear weapons by countries that are currently non-nuclear weapon states (in East Asia and Europe) are fuelling speculation about the sustainability of their current status. Examples of (2) are Israel, Pakistan and India.

152 The Nuclear Nonproliferation Treaty at a Glance, updates; see: <<https://www.armscontrol.org/system/files/npt.pdf>>.

153 See: <<https://www.iaea.org/publications/documents/treaties/npt>>.

154 Reuters, 'Iran might withdraw from NPT if nuclear deal is scrapped: senior official', see: <<https://www.reuters.com/article/us-iran-nuclear-npt/iran-might-withdraw-from-npt-if-nuclear-deal-is-scrapped-senior-official-idUSKBN1HV0UU>>.

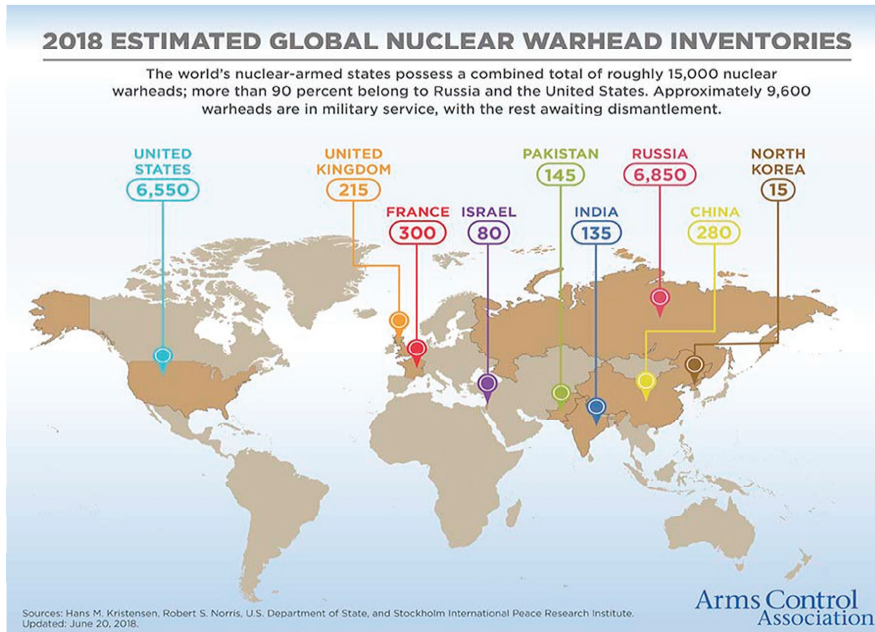


Figure taken from: <<https://www.armscontrol.org/factsheets>>. Sources: Hans M. Kristensen, Robert S. Norris, U.S. Department of State and Stockholm International Peace Research Institute.

Horizontal and vertical proliferation

The AIV notes that developments are taking place in relation to both horizontal and vertical proliferation which are undermining the existing international nuclear arms control regime. This need not immediately jeopardise the survival of the regime and the related treaties, provided that the underlying norms (such as stability, humanity and restraint) remain shared and are the basis for transparency and amendment of the treaties. Naturally, however, the nature, speed and extent of the proliferation are of great importance.

The number of states possessing nuclear weapons and their means of delivery or having access to the means and technology to acquire this status may well increase (horizontal proliferation). And the larger the number of nuclear-weapon states, the greater the chance of accidents and misunderstandings. Moreover, there would then be a greater risk of non-state actors such as terrorists getting hold of nuclear material.¹⁵⁵ The threat of nuclear terrorism has not disappeared and, according to some analysts, is actually growing as international interconnectedness increases and knowledge of advanced nuclear explosives becomes more widely disseminated. The most likely scenarios are a 'dirty bomb' (i.e. a conventional explosive combined with radioactive material) or a terrorist attack on facilities for the production, storage or use of nuclear material. It is much more difficult for non-state actors to produce nuclear material, manufacture a nuclear weapon and use it with advanced means of delivery without attracting the attention of state security services. In the context of the four international conferences on nuclear security (Nuclear Security Summits, including the 2014 Summit in The Hague), various initiatives have been taken to reduce the amount of nuclear material available worldwide and convert it from highly enriched to low enriched uranium, to improve the security of nuclear facilities, storage and transport and reduce the illegal trade in nuclear material. Another subject receiving

¹⁵⁵ See AIV advisory report no. 47, 'The nuclear non-proliferation regime: The importance of an integrated and multilateral approach', January 2006.

attention is the availability of response capabilities in the event of nuclear or radiological contamination.¹⁵⁶

An apparent inability to bridge the gap between the aims of nuclear-weapon states (NWS) and non-nuclear weapon states (NNWS) as set out in Article V of the NPT is also testing the political willingness to 'maintain' the international regime. At the broader international political level, there is 'multipolarisation': world politics are no longer bipolar, even in terms of nuclear weapons, and a number of treaties (especially between the United States and Russia) still in some ways reflect the balance of power during the Cold War. Finally, there is also vertical proliferation: the advancement of the technology of nuclear weapons and their means of deployment from one generation of weapons to the next.

Technological development and nuclear arms control

Technology has always been an autonomous factor strongly influencing nuclear arms control. Technological development is neutral in the sense that it perfects not only the offensive but also the defensive capability of weapons. In addition, verification technology has had positive effects because it has promoted compliance with arms control treaties. All weapon systems are liable to age and have to be replaced if considered essential for the security of the country concerned. The predictability and pace of technological innovation are important factors in relation to arms control, although it should be noted that the direction and speed of advances in technology can sometimes be 'steered' politically. Examples of this are improvement of propulsion technology in the 1950s and 1960s, modification of ballistic missile warheads in the 1970s,¹⁵⁷ verification technology in the 1980s and the development of defence systems against ballistic missiles such as the Strategic Defence Initiative (SDI) and Ballistic Missile Defence (BMD). A more recent addition to this list is hypersonic weapons. While the military and civilian sectors were still sharply segregated and to a certain extent manageable in the 20th century, the playing field is now much less orderly and private parties too can be the driving force behind innovation and technological development.

Numerous distinct but sometimes overlapping developments (see chapter III.3) are putting pressure on 'old-style' arms control, or even rendering it in urgent need of overhaul. Existing and expected technological advances are a cause for concern because they create military possibilities that undermine old certainties and the underlying norms. They can in a sense be regarded as external factors whose impact on the convenient categories agreed for arms control (conventional versus nuclear, offensive versus defensive, strategic versus tactical) may render them obsolete. But dividing lines are also blurred, to some extent knowingly, by politico-military decisions made on the grounds of deterrence logic. A well-known problem that has existed for decades is the existence of dual-capable systems that can give rise to an issue of discrimination and hence attribution. From the point of view of arms control, the

156 For an overview, see: <<https://www.armscontrol.org/factsheets/NuclearSecuritySummit>>.

157 This refers to the practice of arming missiles with multiple nuclear warheads to be delivered to different targets, or fitting them with a means of delivery that is still manoeuvrable in the final stage of flight. MIRV: Multiple Independently-targetable Re-entry Vehicle, MARV: Manoeuvrable Re-entry Vehicle.

deliberate mixing and blurring of categories of weapons is a questionable practice.¹⁵⁸ Compliance with restrictive treaties depends on observation and verification, and this cannot be achieved by traditional means without transparency and clear dividing lines respected by all parties. In view of the evolving foreign policy context, this realisation necessitates agreements at a different level, namely on standards of conduct, conflict and crisis management, confidence-building measures and nuclear risk reduction.

Redundancy

Arms control has always had 'trouble' coping with the sheer number of, sometimes redundant, weapon systems. States prefer to play it safe and accept redundancy in the interests of flexibility, the introduction of new weapon systems alongside existing systems, and reciprocal measures. In the past, some degree of redundancy even paved the way for arms control, because it provided certainty and ensured that the politically valuable arms control dialogue could go ahead in any event.¹⁵⁹ Nonetheless, redundancy can also be costly and harm the chances of nuclear arms control. There is a risk that developing and introducing new weapon systems, partly as an incentive for arms control negotiations, may create surpluses and imbalances if the intended negotiations fail to materialise or to produce a result.

IV.3 A changing international setting

Naturally, the Netherlands has little room to pursue an independent policy on nuclear arms control. However, as an EU and NATO partner and participant in numerous forums (at multilateral level, in like-minded coalitions and 'friends of' groups, but bilaterally too), it has ample opportunity to participate in the debate. The Dutch position is set out in the coalition agreement of the Rutte III government: 'Within the framework of the Netherlands' obligations as a member of the North Atlantic alliance, the government will work actively to rid the world of nuclear weapons, in view of the great risks associated with nuclear proliferation.'¹⁶⁰ The government explained its position on nuclear disarmament in a letter to the House of Representatives, partly in response to a motion submitted by MP Sjoerd Sjoerdsma and others.¹⁶¹ In doing so it continued in the role of 'bridge-builder' adopted by the previous government. This role now needs to be performed in a changing international setting.

158 For a discussion of this subject, see Vipin Narang, 'The Discrimination Problem: Why Putting Low-Yield Nuclear Weapons on Submarines Is So Dangerous,' 8 February 2018, <<https://warontherocks.com/2018/02/discrimination-problem-putting-low-yield-nuclear-weapons-submarines-dangerous/>>, and, in reply, Austin Long, 'Discrimination Details Matter: Clarifying an Argument About Low-Yield Nuclear Warheads', 16 February 2018, <<https://warontherocks.com/2018/02/discrimination-details-matter-clarifying-argument-low-yield-nuclear-warheads/>>.

159 'Indeed, U.S. pursuit of a SLCM may provide the necessary incentive for Russia to negotiate seriously a reduction of its non-strategic nuclear weapons, just as the prior Western deployment of intermediate-range nuclear forces in Europe led to the 1987 INF Treaty'. (NPR, op. cit., p. 55.)

160 Coalition Agreement: 'Confidence in the Future', 10 October 2017, p. 52, <<https://www.government.nl/documents/publications/2017/10/10/coalition-agreement-confidence-in-the-future>>.

161 Parliamentary Paper 33 694, no. 15 (motion by Sjoerdsma et al. of 15 May 2018); letter from the Minister of Foreign Affairs to the House of Representatives concerning the Dutch position on nuclear disarmament, BZDOC-2117071682-140, 21 June 2018.

First at global level, where multilateral treaties or initiatives, often dating from the 20th century, are due for maintenance or renewal or are in some cases still awaiting implementation or need to be adapted to take account of a clearly new security situation and, in brief, are currently by no means future-proof. As by far the largest stockpiles of nuclear weapons are held by the United States and Russia, it is essential that they lead and direct the process of nuclear arms control and are at least agreed on the basic principles, control of the possession of nuclear weapons (non-proliferation with regard to states and non-state actors) as well as the security of nuclear weapons (the Nuclear Security Summit process, IAEA procedures). All of this is less self-evident than it was a few decades ago, now that the traditional initiator of nuclear arms control – the United States – is seemingly no longer willing to bear all the burdens of hegemonic leadership, regardless of the benefits. Although the NPR 2018 does emphasise the importance which the United States attaches to arms control, it also points out that there is a current lack of global consensus and that ‘strategic competition’ among the major powers is now the norm.¹⁶² This is reflected more emphatically than before in US ‘conditionality’: the United States will only engage in arms control in general and enter into specific commitments if this primarily benefits its security and that of its allies.¹⁶³

Second, at transatlantic level, where there is a debate about the extent to which NATO has scope to pursue an independent arms control policy alongside that of the United States or to significantly influence US policy. While that scope may be limited, it is not negligible, due to various factors. For example, the ‘forward’ geographical position of European NATO member countries creates vulnerabilities, but it also offers them certain distinct military advantages. However, the more the United States reduces its dependence on them by using assets not deployed on European territory, the more the influence of these countries wanes.

The NATO arrangement has traditionally involved a division of nuclear roles: apart from the relatively modest nuclear assets of the United Kingdom and France, the member

162 Fact sheet ‘21st Century Security Environment. An increasingly dangerous, dynamic, and uncertain 21st century security environment drives this administration’s posture reviews’, <<https://media.defense.gov/2018/Feb/02/2001872883/-1/-1/1/21ST-CENTURY-SECURITY-ENVIRONMENT.PDF>>. ‘The international security environment has deteriorated since 2010. Many previous assumptions are no longer valid. Strategic competition among states characterizes today’s environment (...).’ On arms control, the NPR Fact Sheet 2018 ‘Reducing Nuclear Dangers’ says: ‘The United States remains committed to its arms control obligations under New START and other arms control treaties to which it is party. The United States will focus on helping to create political and security conditions conducive to future arms control negotiations.’ <<https://media.defense.gov/2018/Feb/02/2001872883/-1/-1/1/REDUCING-NUCLEAR-DANGERS.PDF>>

163 NPR Fact Sheet, op. cit., ‘The United States remains prepared for and receptive to future arms control negotiations if the potential outcome improves the security of the United States, its allies and partners.’ Example of specific conditionality: CTB Treaty 1996 (the Comprehensive Test Ban Treaty, which the United States has not ratified but with which it has so far complied). See also: NPR 2018, p. XVII: ‘The United States will not resume nuclear explosives testing unless necessary to ensure the safety and effectiveness of the U.S. nuclear arsenal, (...)’. As regards the simulation of nuclear weapons testing, see also: Stephen Chen: ‘China steps up pace in new nuclear arms race with US and Russia as experts warn of rising risk of conflict’, in: *South China Morning Post*, 28 May 2018, <<https://www.scmp.com/news/china/society/article/2147304/china-steps-pace-new-nuclear-arms-race-us-and-russia-experts-warn>>.

countries decided against having their own nuclear weapons in exchange for the protection of the US 'nuclear umbrella'. They have supported the global non-proliferation regime based on US dominance and have had some say in policy, for example through NATO's North Atlantic Council. In theory, it is not inconceivable that this 'solidarity' could also unravel due to doubts about the value of the NATO agreements and the recalcitrant attitude of some member countries, such as Turkey, which are severely testing the limits of cohesion. Needless to say, a country stands to gain more influence over NATO's nuclear policy and possibly that of the United States by continuing with rather the abandoning NATO membership and nuclear hosting.

Third, at European level, it should be noted that there is no evidence of a visible European caucus in NATO or indeed of a clear definition of Europe's interests. That is unfortunate. In its recent advisory report on forming coalitions in the EU after Brexit, the AIV remarks generally: 'This unravelling transatlantic backdrop is certainly forcing the Netherlands to reorient itself in Europe.'¹⁶⁴ This has not yet happened in the realm of nuclear defence. Although economic ties with the United States are described as 'very close', the AIV also notes that: 'The EU's relationship with the US would still need to be reviewed even if the presidency of Donald Trump were to be seen as an aberration, a temporary deviation from the traditional pro-European policy of the US. Irrespective of who occupies the White House, the security of Europe has for some time no longer been the main concern of US security policy.'¹⁶⁵ A debate about non-proliferation is being conducted among academics and NGOs, although not related to the option of a European nuclear force.¹⁶⁶

164 AIV advisory report no. 108, 'Forming Coalitions in the EU after Brexit: Alliances for a European Union that modernises and protects', 7 September 2018, p. 7.

165 Ibid, p. 39.

166 See, for example: <<http://www.eufp.eu/arms-control>>.

V NATO policy

V.1 NATO's nuclear policy

NATO's nuclear policy was described in its 2010 Strategic Concept and its 2012 Deterrence and Defence Posture Review (DDPR) and confirmed in the final declarations of the NATO summits in Wales (2014), Warsaw (2016) and Brussels (2018). This policy is summarised below. In view of its resolve to defend its territory and populations, NATO will maintain an appropriate mix of nuclear, conventional and missile defence capabilities necessary to deter and resist any threat. Nuclear weapons play a crucial role in this. NATO endorses the goal of creating conditions for a world without nuclear weapons. However, as long as nuclear weapons exist, NATO will remain a nuclear alliance.

In NATO policy, nuclear weapons are the supreme guarantee of the security of the Alliance, particularly the strategic nuclear weapons of the United States. The independent strategic nuclear forces of the United Kingdom and France contribute to the overall deterrence and security of the Allies. France has kept its nuclear arsenal outside NATO and attaches great importance to its nuclear autonomy. The circumstances in which NATO might have to contemplate using nuclear weapons are extremely remote. The Brussels Declaration emphasises that NATO continues to adapt, for example by providing an effective response to changes in the posture and doctrine of potential adversaries, and their significant investments to modernise and expand capabilities. As a consequence of changes in the security environment, NATO has taken steps, according to the final declaration, to ensure its nuclear deterrent capabilities remain safe, secure, and effective.¹⁶⁷

The NATO Allies (with the exception of France) hold regular consultations on nuclear weapons policy in the Nuclear Planning Group (NPG). The main subjects dealt with are developments relating to the United States' nuclear weapons, NATO doctrine and nuclear weapons planning, and the consultation arrangements in the event that the use of nuclear weapons were to be considered. The aim is to achieve the widest possible participation of the Allies in NATO's nuclear task on the basis of the existing nuclear sharing arrangements. Besides the United States, a number of NATO's European members (Belgium, Germany, Italy, the Netherlands and Turkey) provide dual-capable fighter aircraft that can be equipped with US nuclear gravity bombs. This is why some of these weapons have been stockpiled in Europe. The Netherlands contributes one F-16 squadron, which is stationed at Volkel Air Base. Although stockpiling locations have been mentioned in publications,¹⁶⁸ the Dutch government, like all other NATO partners, has always maintained that, on the basis of Alliance agreements, no information is provided about

¹⁶⁷ Brussels Summit Declaration, paragraphs 34 and 35.

¹⁶⁸ See, for example, Robert S. Norris & Hans M. Kristensen: 'US tactical nuclear weapons in Europe', *Bulletin of the Atomic Scientists*, No. 67-1, 2011, pp. 64-73.

numbers and locations of US nuclear weapons in Europe.¹⁶⁹

For some time, NATO documents have reflected the fact that the deployment of sub-strategic nuclear weapons in Europe is receiving less and less attention. The 1999 Strategic Concept described the nuclear forces in Europe as an 'essential political and military link' between the European and North American members of the Alliance. Although the 2010 Strategic Concept repeats the importance of the broadest possible participation of the Allies in, for example, peacetime basing of nuclear forces, it no longer describes them as an essential link. The 2012 DDPR even announced the development of concepts to ensure the broadest possible participation in the nuclear sharing arrangements, even if NATO were to decide to reduce its reliance on nuclear weapons based in Europe. This wording seems to reflect the discussions within the Alliance (mainly initiated by the German government of the time) as to whether it was still necessary to deploy nuclear weapons in Europe in peacetime. In view of recent security policy developments, the words 'essential political and military link' have been reinstated in the United States' 2018 NPR. Likewise the Brussels Declaration (July 2018) describes the Alliance deterrence and defence posture as an 'essential political and military transatlantic link'.

V.2 Credible deterrence

During the Wales Summit (2014) and the Warsaw Summit (2016), NATO took general measures to increase NATO's conventional striking power through greater readiness and forward deployment of ground units. In its earlier advisory report on 'The Future of NATO and European Security' the AIV argued that additional measures were necessary.¹⁷⁰ Now it is necessary to consider to what extent the nuclear policy too must be adjusted.

The basic principle is that as long as nuclear weapons exist, NATO will remain a nuclear alliance. This wording is somewhat unfortunate because the NATO Alliance is first and foremost a community of values and a security organisation aimed at the collective defence of Allied territory; nuclear weapons play an important role in deterrence, but certainly not as the sole means.

The political and military significance of the nuclear weapons within NATO lies in their contribution to preventing war by means of deterrence and defence, and thus their role as the ultimate guarantee of the Alliance's security. All nuclear measures taken by NATO that contribute to credible deterrence ultimately serve to ensure that these weapons will never have to be used. Even in the current security situation, the chance of nuclear weapons being used is highly remote; only in the most extreme circumstances would this be considered. Despite the changes over the past few decades, NATO's nuclear

169 See, for example, the response by former Minister of Foreign Affairs Frans Timmermans to the request of the Permanent Parliamentary Committee on Foreign Affairs concerning the statements by former prime ministers Ruud Lubbers and Dries van Agt about the presence of nuclear weapons at Volkel Air Base, Parliamentary Paper 33 783 no. 3 dated 25 October 2013; and, more recently, the answers given by Minister of Foreign Affairs Stef Blok and Minister of Defence Ank Bijleveld to questions from MPs Sadet Karabulut, Bram van Ojik and Lilianne Ploumen about nuclear weapons policy, dated 29 March 2018.

170 AIV advisory report no. 106, October 2017. See: <<https://aiv-advies.nl/919/publications/advisory-reports/the-future-of-nato-and-european-security>>.

policy is characterised by continuity. After all, credible deterrence based on nuclear weapons is instrumental in this.

NATO's 2012 Deterrence and Defence Posture Review concluded that 'the Alliance's nuclear force posture currently meets the criteria for an effective deterrence and defence posture'. The question is whether NATO should take extra measures now in the light of the evolving nuclear security context. In general terms there is no need to 'mirror' every single development in Russia's nuclear doctrine. In contrast to the conventional balance of power, the deterrent effect of nuclear weapons does not depend on full parity, provided that NATO at least has the capabilities, flexibility and decisiveness to allow credible implementation of its deterrence policy, including the contribution of nuclear weapons.

The growing debate within NATO about transatlantic solidarity is a worrying development. If doubts arise about the willingness of the United States to help the European members of the Alliance without reservation in the event of aggression, this may have very adverse consequences and seriously undermine deterrence. Tensions between the United States and Europe pose an even greater risk if they also relate to the nuclear dimension of Europe's defence. The US president has made statements that could give rise to doubts about his country's security guarantee. US policy, or rather the lack of clarity about it, raises questions about the continuity of the Alliance's strategic cohesion. However, it is too early to conclude that US policy on this matter has undergone a fundamental change. The NPR emphasises the importance of regional deterrence and extended deterrence, for which additional flexible nuclear options are envisaged. On the other hand, the maritime measures that have been announced (low-yield submarine-launched ballistic missiles (SLBMs) and sea-launched cruise missiles (SLCMs)) do not require host nation support from Allies. Finally, it should be noted that the scope of the NPR is global and thus not confined to Europe and transatlantic security. The developments in Asia and the Pacific and the obligations of the United States to its allies in this region are of particular relevance here.

A European nuclear deterrent?

Since the 'Pivot to Asia' under the Obama administration, the United States has tended to leave it up to the European countries themselves to take the initiative in protecting their security interests, thereby enabling it to focus more on its interests in Asia. Under the Trump administration, the less self-evident nature of Washington's leadership and support is now expressed in sharper terms than before.¹⁷¹ The possibility that this attitude will continue unchanged after the Trump era cannot be excluded. Confidence in the United States is now at a very low ebb among the population of most European countries. European leaders question the US security guarantees, and there are sometimes even doubts about whether our Ally still epitomises the shared values that have sustained transatlantic cooperation under US leadership for so long. The debate about an independent European nuclear deterrent has been under way since late 2016, initially in the German media and later internationally as well (for an overview see Annexe V).

171 According to some commentators, the differing strategic orientations of the United States and its European Allies (sometimes referred to as 'transatlantic drift') date from the end of the Cold War when the 'West' lost its common enemy. Presidents George W. Bush and Obama criticised the lagging defence spending of NATO's European members. Now President Trump has demanded a substantial increase in defence spending by the European Allies and appears to have made this a condition of security cooperation.

There has been a growing awareness among European political leaders that Europe needs to be much more self-reliant in matters of security. NATO's European members have seriously neglected their armed forces since the end of the Cold War and now seem to realise, partly at the urging of successive US administrations, that they must make a greater defence effort and work more closely together. Although this is strengthening its strategic capacity to act, Europe will continue for the time being to be as dependent as ever on the United States when it comes to conducting and sustaining sizeable military operations. This dependence is not expected to disappear in the next 10-20 years. Despite the actions of the current US president, there is still great support for NATO in Congress and among the US population. The House of Representatives and the Senate have passed laws making it more difficult for the United States to withdraw from NATO.¹⁷² In fact, the contribution by the United States to the defence of Europe has actually been considerably strengthened during the Trump administration under the European Deterrence Initiative.

The basic principles of nuclear policy, including the US role, are not at issue within NATO. It would therefore be premature to draw up a specific 'Plan B', to cover a situation in which at some point in the future Europe can no longer invoke the US nuclear security guarantees. Such a plan would cause great uncertainty about how the European countries want to safeguard their security interests in extreme cases. Although this does not mean that there should be a taboo on thinking about ending the security dependence on the United States in the future, restraint and realism are required because such an 'uncoupling' would not be conducive to the security and stability of Europe in the foreseeable future.

From a geopolitical perspective, a more independent Europe that cooperates more closely on foreign and security policy is as necessary as it is welcome. After all, dependence makes Europe vulnerable, not only to US influence but also to China's growing influence. Although the main threat at present, particularly for Europe's eastern flank, emanates from Russia, in the longer term the rise of China is expected to pose the biggest challenge to the continent as a whole. It seems likely that the United States and Europe together, as Western democracies, will have to provide a powerful counterbalance, in both military and economic terms, to this future economic and military world power. Any worsening of the bond between them could be very harmful to both. The United States now has 28 main operating bases in Europe, enabling it to exert influence and carry out operations worldwide. For the United States, the loss of the transatlantic bond would mean 'America Alone', leaving it isolated in a complex and dangerous world. For Europe, the consequences for the next 10-20 years would, if anything, be even more severe, as it would become vulnerable to undermining and interference by various major military powers less well-disposed to Europe.

It is of the utmost importance that Europe give priority to achieving greater military independence in conventional terms. This is necessary not only in order to establish a more balanced relationship with the United States as quickly as possible and to make a serious contribution to the Alliance in a military sense, but also in order to be prepared for developments unfavourable to Europe in an uncertain world. True 'strategic autonomy' requires not only a military component (with a nuclear dimension) and a strong industrial and economic base, but above all, the political capacity to act in times

172 See: <<https://www.defensenews.com/congress/2019/01/23/us-house-votes-overwhelmingly-to-bar-us-exit-from-nato/>>.

of crisis. There is still a long way to go before this can be attained. All things considered, the alternative of nuclear deterrence by a European nuclear force is therefore not an obvious option for the time being. Although the nuclear forces of France and the United Kingdom contribute to the Alliance's deterrence posture, it is based on the strategic nuclear arsenal of the United States.

Leaving aside the issue of the feasibility of a European nuclear deterrent force, there is also the question of whether agreement could be reached on its desirability and, if so, how it should be structured and could be reconciled with the NPT agreements. It is also debatable whether the common frameworks and capabilities of the European Security and Defence Policy would be robust enough in the foreseeable future to serve as the basis for a European nuclear force, which would in fact be the culmination rather than the start of the process. Even if there were support for going down that path, bearing in mind all the issues about decision-making powers and national sovereignty, a European nuclear force would almost certainly not take the form of a truly common nuclear capability but instead that of a security guarantee, embedded in shared frameworks, given by one or both European nuclear powers (see also Annexe V).

There is no alternative to a more independent Europe standing not against but alongside the United States. The political and military significance of transatlantic solidarity is essential. It is hard to imagine that a European nuclear force could be a viable alternative within the foreseeable future to the security guarantee provided by the strategic nuclear triad of the United States for the European members of NATO. Nonetheless, it is still necessary to intensify Europe's foreign and security policy and to increase its military, economic and political independence. In view of the uncertain future, especially vis-à-vis relations with the United States, it would also be wise to explore the scope for achieving greater European nuclear independence. The AIV could help to formulate thinking on this subject by preparing a separate advisory report.

V.3 Division of nuclear roles and tasks

NATO's nuclear deterrence is assured by US national systems and dual-capable aircraft (DCA) operated in NATO context by five European member countries, including the Netherlands. While relatively small in size compared with those of the United States (minimum deterrence), the independent French and British nuclear forces contribute to the overall deterrence and security of the Alliance. France and the United Kingdom, unlike the United States, have traditionally not contemplated counterforce options, since they lack the technical and financial resources.¹⁷³ The United Kingdom has four nuclear-powered ballistic missile submarines. It relies heavily on cooperation with the United States for the ballistic missiles carried on these submarines. Besides four nuclear-powered ballistic missile submarines, France also has nuclear air-launched cruise missiles. In the 2018 NPR, the United States presented plans to increase the flexibility of its nuclear capabilities by introducing low-yield options for a number of sea-launched missile systems and developing nuclear-armed sea-launched cruise missiles. These weapons can be used worldwide without the need to operate from Allied territory and with the virtual certainty that they can penetrate an adversary's air defence. How this will affect the deterrence role of European NATO countries, especially the DCA countries, therefore needs to be considered.

173 Bruno Tertrais, 'A Comparison between US, UK and French Nuclear Policies and Doctrines', CERJ, March 2007.

Introduction of low-yield, sea-launched options and the DCA task

Russia has a wide range of sub-strategic nuclear weapons and is engaged in an extensive modernisation programme including those weapons. An important factor is not only that Russia has a considerably larger number of nuclear weapons but also that they are of a much more varied nature, especially those in the sub-kiloton category. It is necessary to prevent a situation in which Russia would consider using them as a battlefield weapon. NATO believes that any use of a nuclear weapon, however small, would fundamentally change the nature of the conflict. According to a publication of the Center for Strategic and International Studies (CSIS), NATO presently has only one sub-kiloton nuclear weapon that could be used, namely the B61 gravity bomb (with a lowest yield setting of 0.3kt) carried by dual-capable aircraft (DCA). The question is to what extent the existing dual-capable aircraft would be capable of penetrating Russia's modern air defence. In recent years Russia has invested heavily in highly advanced and effective air defence and Anti-Access/Air Denial (A2/AD) systems. Using these NATO assets is thus becoming increasingly problematic. NATO should not be dependent on a sub-kiloton nuclear option that first requires elimination of Russia's integrated air defence system and possibly also its command-and-control and sensor systems in Russia itself before a nuclear response is possible.

As NATO currently only has one such option (i.e. delivery by the DCA referred to above, which are in some ways outdated), this increases the risk of the use of nuclear weapons by an adversary. This could warrant the conclusion that NATO would be reluctant to use a strategic nuclear weapon with a relatively high-yield value if the adversary itself uses a sub-strategic nuclear weapon in the sub-kiloton category. Adequate options at a comparable sub-kiloton level could enhance credible deterrence in order to dissuade an adversary from using a sub-kiloton weapon. This may be a reason for the United States to consider having an extra sub-kiloton option (the sea-launched low-yield option), in addition to the DCA option, to serve as an adequate deterrent against the available Russian options and contribute to escalation control. Another factor is security policy developments in Asia and the Pacific and the obligations of the United States towards its allies in this region.

It should be noted that the introduction of extra low-yield options creates a dilemma, since it can be regarded as lowering the threshold for the possible use of a nuclear weapon. However, if they are to contribute to credible nuclear deterrence, low-yield weapons must be regarded by an adversary as a realistic military option at that low level of nuclear escalation. Measures that make the use of such a weapon more credible can therefore help to prevent Russia from using a low-yield weapon and can therefore actually be seen as raising the threshold.

The introduction of sea-launched, low-yield nuclear options could affect the deployment of US weapons on European territory. After all, the sea- or air-launched US systems could in themselves provide a credible nuclear deterrence. However, it should be borne in mind that under the existing nuclear sharing arrangements the credibility of the deterrent is enhanced by the fact that the European governments concerned demonstrate extra responsibility through their active participation, for example through their fighter aircraft taking part in nuclear operations. The significance of this participation is not only military but above all political since it ensures that the United States and NATO's European members maintain a close dialogue on nuclear as well as other security policy issues. However, this political significance depends very largely on the extent to which a nuclear option of this kind can be viewed as militarily viable.

For example, as noted above, there are concerns that the improved Russian air defence system may reduce the effectiveness of the current dual-capable aircraft systems. On the other hand, the F-35, which is due to replace the old fighter aircraft in several countries in the next few years, is less vulnerable in this respect. The 2018 NPR stresses that the United States is working with NATO to ensure – and improve where needed – the readiness, survivability and operational effectiveness of DCA based in Europe.¹⁷⁴

Nuclear sharing is at the root of collective defence. In that context, DCA and their conventional support are essential pillars of the extended deterrence and hence of the United States' involvement in Europe's security. Nuclear sharing has also helped prevent more European countries from pursuing nuclear ambitions and thus contributes to the aim of the NPT. It is also important to note that, as they are easily visible to an adversary, DCA are particularly suitable for nuclear messaging (procedures that imply higher or lower readiness levels), which is an important step on the escalation ladder that can help avoid a nuclear confrontation. Moreover, DCA aircraft, once airborne, can be recalled (re-tasked) at the last minute, which contributes to their flexibility in use. The Netherlands and the other DCA countries occupy a special position when it comes to discussing nuclear matters. Another relevant point to consider is whether unilateral discontinuation of the DCA task by the Netherlands would destabilise the security situation. After all, other European NATO member countries closer to Russia have on several occasions indicated their willingness to take over this task, which the Kremlin would probably interpret as a serious provocation.

The Founding Act on Mutual Relations, Cooperation and Security between NATO and the Russian Federation of 1997 stipulated that NATO had no intention, plan or reason to deploy nuclear weapons in the territory of NATO member countries in Eastern Europe. According to reports, some non-nuclear countries to which the Founding Act applies (such as Poland) should be allowed, in the present circumstances, to participate more actively in NATO's nuclear task, for example through the active involvement of their fighter aircraft.¹⁷⁵ However, as already noted, such a measure could adversely affect relations with Russia. All NATO members which so wish (with the exception of France) may participate in the deliberations in the Nuclear Planning Group. Besides the United States, five European NATO members (Belgium, Germany, Italy, the Netherlands and Turkey) provide fighter aircraft that can carry out nuclear missions, while other countries can provide operational support with their conventional air forces. Although all countries in the Nuclear Planning Group are politically involved and can, if they so wish, contribute to conventional support, the AIV sees no reason why the NATO members in Eastern Europe should have a nuclear task.

174 2018 U.S. Nuclear Posture Review, pp. XII and 36.

175 See, for example, Hans M. Kristensen, Federation of American Scientists, <<https://fas.org/blogs/security/2015/12/poland>>.

At some point in the future a decision will be made regarding the continuation of the nuclear task the Netherlands currently fulfils within NATO with its fighter aircraft.¹⁷⁶ In the AIV's opinion, discontinuation of the nuclear task by the European member countries would damage the Alliance's cohesion, undermine the United States' willingness to guarantee the security of the European countries, and negate those countries' influence on US policy.

176 In response to the motion submitted by MP Jasper van Dijk motion on 6 November 2013, proposing that the F-35 should not continue the Dutch nuclear task, Minister of Defence Jeanine Hennis-Plasschaert and Minister of Foreign Affairs Frans Timmermans stated on 14 January 2014 (Parliamentary Paper 33 783 no. 5) that the government did not wish in advance to commit itself to the position expressed in the motion. The government regarded the motion as an encouragement to continue to vigorously pursue the Netherlands' policy on reducing and eventually eliminating all nuclear weapons, including non-strategic nuclear weapons throughout Europe. The ministers stated that the F-16 would certainly not cease to be operational before 2024. They added that it was impossible to predict how NATO's overall deterrence and defence capabilities would look by that time.

VI conclusions and recommendations

VI.1 Conclusions

Ethical principles and international law

In politics and society at large, there are rightly serious concerns about the role that nuclear weapons still play – to an increasing extent even – in international relations. In the new geopolitical reality, the role of nuclear weapons appears to be growing rather than diminishing. According to the norms of deontological ethics, the complete rejection of nuclear weapons, leading to efforts towards their elimination, unilateral if necessary, is understandable and respectable. From the point of view of consequentialist ethics, however, there are also important arguments in favour of not eliminating nuclear weapons as long as potential adversaries continue to possess or aim to possess them, and could exploit that to their strategic advantage. Since the Second World War, nuclear weapons have served in part as a barrier (psychological or otherwise) against aggression on the part of a strategic rival, and as a last resort whereby states under threat could put an end to an overwhelming attack. As yet no other weapons exist that are thought to have a similar war-preventing effect. The AIV is of the opinion that, given the current situation, the possession of nuclear weapons is justified only for the purpose of preventing war and as a precondition and starting point for negotiations to achieve mutual nuclear arms control, arms reduction and, ultimately, disarmament.

In addition to a valid legal basis, every use of force requires those involved to act in accordance with the relevant legal regime. This concerns international humanitarian law (IHL) and human rights. The International Court of Justice declared unanimously in its advisory opinion of 1996 that the threat or use of nuclear weapons in general would be contrary to the rules of international law applicable to armed conflicts and, in particular, to the principles and rules of humanitarian law. However, in view of the state of international law and the elements of fact at its disposal, the Court could not definitively determine whether or not the threat or use of nuclear weapons would be lawful in extreme circumstances of self-defence where the very existence of a State would be at stake.

However, the law on this subject continues to evolve: according to the Non-Proliferation Treaty and the International Court of Justice, states have an obligation to achieve complete and properly verifiable nuclear disarmament through negotiation. The Treaty on the Prohibition of Nuclear Weapons, to which reference has already been made, is also relevant in this connection. This treaty reaffirms the goal of a nuclear-weapons-free world in accordance with Article VI of the Non-Proliferation Treaty, but lacks the support of the nuclear-weapon states and their allies. Ratification by at least 50 states is required for the treaty to enter into force, but as yet this has been done by only 19 of the 69 signatory states. The Netherlands was the sole NATO member country to take part in the negotiations, but decided that the outcome did not sufficiently meet the five criteria that had been set beforehand. The new Nuclear Ban Treaty will not bring a nuclear weapons-free world any closer as long as no nuclear-weapon states are party to it.

In the AIV's opinion, there are very few if any situations or locations conceivable where the use of a nuclear weapon would not contravene international humanitarian law. Apart from legal and ethical arguments, the risk of nuclear escalation would be a particularly relevant factor in the event that a nuclear weapon were to be used against another nuclear-weapon state. The first use of a nuclear weapon since the Second World War

would undoubtedly carry a great risk of escalation, with unacceptable consequences. The AIV therefore believes that, as long as nuclear weapons exist, it will be necessary to ensure that they are never used.

Changed nuclear security context

Besides conventional deterrence, in today's world order, nuclear deterrence is unfortunately unavoidable for NATO. Given the risks associated with nuclear weapons, priority should be given to arms control and nuclear disarmament. However, this should not be at the expense of global stability and security. Nuclear disarmament can increase international security and stability only if the likelihood of conflict and use of a nuclear weapon is kept to an absolute minimum during the disarmament process. That is why this process must be arranged with adversaries in a reciprocal manner in such a way that the security of the Netherlands and the Alliance remains guaranteed. Confidence-building measures and agreements on nuclear risk reduction can be an important step in this process.

As became apparent during the Cold War, power struggles between major powers can result in arms races that are hard to control and cause crises with potentially catastrophic consequences, unless the rivalry is tempered by confidence-building measures, mutually accepted norms and agreements on military restraint. According to many analysts, there is growing risk of history repeating itself here. First, because of the deteriorating relationship between the United States and Russia (which still have by far the largest nuclear weapon arsenals) and, second, increasingly because of the fear of confrontations with China (which is very much on the rise as a superpower). The treaties on nuclear arms control are vulnerable and inadequate in view of global power shifts, technological advances, mutual allegations of treaty violations, and the lack of progress in implementing the Non-Proliferation Treaty.

The importance of dialogue, risk reduction and promoting strategic stability seems to be overshadowed by geopolitical rivalry. The Nuclear Ban Treaty, which has not yet entered into force, reaffirms the objective of a nuclear-weapons-free world in accordance with Article VI of the NPT, but lacks the support of the nuclear-weapon states and their allies. The AIV considers that for various reasons, as set out in the Netherlands' statement explaining its vote on the ban in July 2017, the treaty will probably not bring the objective of complete global abolition of nuclear weapons any closer. Indeed, it could even prove counterproductive if it harms the traditional regime of nuclear arms control. Signing the new treaty for the prohibition of nuclear weapons would be legally incompatible with the agreements that apply in NATO, which make it possible to rely on nuclear security guarantees for self-defence. It is noteworthy that Switzerland, which attaches great importance to its neutrality and to compliance with international law, took this factor into account when deciding not to sign the Nuclear Ban Treaty at present.

Although the subject of nuclear weapons was relegated to the background in the political debate of the 1990s and measures were taken to drastically reduce their numbers, this did not mean that they became less important for the defence of the Alliance and in the prevention of large-scale conflict. In fact, there was a high degree of continuity. So it is not as though nuclear deterrence has made a comeback; it has always been an essential component of international security policy and is simply now in the spotlight again. Modernisation plans have been announced by all nuclear-weapon states. It is therefore unlikely that the role played by nuclear weapons as the ultimate deterrent will cease or diminish in importance in the coming decades. None of the internationally recognised nuclear-weapon states has been prepared to contemplate complete nuclear

disarmament in the existing international conditions and some non-nuclear-weapon states seem likely to continue cherishing nuclear ambitions. For the foreseeable future, non-proliferation seems more urgent, particularly if 'threshold states' such as Iran can be induced to refrain from creating their own nuclear weapons arsenal in exchange for security guarantees and other commitments.

New focal points of US security policy

Since the Second World War the United States has been strategically dominant and provided leadership in the NATO area. It has also tried, with varying degrees of success, to be the leading power outside the NATO area. The US role provided security and a degree of stability for Western Europe during the Cold War and for Central Europe as well after the Cold War. However, the non-Western world has not accepted US leadership, and Russia and China have refused ever more emphatically to conform to the principles of the North Atlantic post-1945 order (China has admittedly accepted the capitalist system, but without political freedom). Remarkably, the current US president has undermined or even abandoned some of the principles of US leadership as established since 1945. It seems safe to assume that these and other global changes are a source of major tensions and instability both in Europe and elsewhere.

Russia and China have instituted extensive programmes of investment in their armed forces aimed at closing the gap with the United States in terms of weapons and other technology, and military capabilities in general, over the coming decades. And in some areas the United States has already been overtaken. Although Washington recognises that there are clearly limits to global military action, it continues to believe that global stability and security are best served by strong US leadership. In exercising that leadership, it makes no secret of the fact that national security interests come first. In policy documents the United States now stresses more overtly than in the past that it must be able to rely on credible deterrence strategies in relation to a wide range of adversaries. This is why it feels it necessary to implement the plans (some of which were drawn up under the Obama administration) for modernising its nuclear arsenal, which largely dates from the Cold War era.

In view of a possible scenario in which Europe, without fully reliable nuclear security guarantees from the United States, could find itself vulnerable to nuclear blackmail and other destabilising coercive strategies as the international security situation evolves, the new US plans in the nuclear field merit serious consideration. Of particular relevance to NATO is the fact that the US government noted in the 2018 NPR that, besides the long-planned modernisation of the European DCA, additional measures and flexibility are needed to respond to a more assertive Russian nuclear posture and thus preserve the credibility of the deterrence. To provide extended deterrence in Northeast Asia and possibly also avoid a complicated discussion within NATO about the use of nuclear weapons deployed in Europe, it has chosen to put a new emphasis on sea-launched nuclear weapons.

A number of submarine-launched ballistic missiles will be equipped with a relatively limited nuclear payload (low-yield SLBMs). The plan is to develop a new sea-launched cruise missile (SLCM), even though the sea-launched Tomahawk land attack cruise missiles (TLAM/N) were taken out of operation as recently as 2010. Besides implementing the B-61 gravity bomb life extension programme initiated by the Obama administration, the plans include replacing the outdated air-launched cruise missile (ALCM) by a new long-range stand-off missile. Both capabilities have low-yield options. In response to Russia's violation of the INF Treaty, the United States has announced in the

NPR that it is commencing INF Treaty-compliant research and development by reviewing military concepts and options for conventional, ground-launched, intermediate-range missile systems. The reference to the research in this context seems to suggest that if Russia's apparent violations of the INF Treaty continue (in particular, the deployment of the 9M729 system), the United States wishes to have comparable options at its disposal in due course. This measure, like the announcement of the development of the new SLCM, can be seen as part of the overt efforts by the United States to increase the pressure on Russia to refrain from deploying weapon systems in breach of the INF (in the form of a bargaining chip).

The recent announcement by the United States of its decision to withdraw from the INF Treaty because Russia has been violating its obligations with impunity for years, and China (which is not a party to the treaty) is developing short- and intermediate-range missiles unhindered, underlines just how serious the United States is now taking this matter. Whether Russia will allow itself to be coerced into compliance with the INF Treaty is debatable. It does not seem likely at present. If the United States is assuming that its withdrawal from the treaty will enable it to develop ground-launched nuclear cruise or ballistic missiles and deploy them in Europe, this is almost certainly a miscalculation, even if some countries (such as Poland) may allow this. If new nuclear weapons were to be deployed in Europe, this would be likely in the current circumstances to undermine still further the cohesion of the Alliance and widen the transatlantic drift, thereby playing into Russia's hands even more. Although it is of great importance to have new treaties that relate not only to the United States and Russia, but also to China and the other nuclear-weapon states, it remains to be seen whether China will accede to the INF Treaty (the same applies to India, Pakistan, Israel and Iran owing to the composition of their arsenals) or whether the outcome of the negotiations will be that the geographical scope of the treaty is confined to Europe.

No expansion of the US nuclear arsenal need be expected for the time being. First of all, as already noted, the Trump administration is allowing scope for fresh negotiations with Russia, which could mean that the additional measures never come to fruition. Moreover, the replacement and modernisation plans will have to be implemented step by step, which will require approval of the annual defence budget. It remains to be seen whether there is sufficient support for all the planned investments, especially now that the Democratic Party has won a majority in the House of Representatives in the midterm elections. Finally, under the existing legislation, every US administration needs the approval of Congress for the development of new or modified nuclear warheads. In view of the long-standing debates in Congress about the need for additional non-strategic (low-yield) nuclear weapons, it is not clear whether the additional measures announced in the NPR, which qualify as modernisation or modification, will be agreed and, if so, on what conditions.

On the other hand, the tone of US nuclear policy and rhetoric has become undeniably sharper. The United States wishes to retain a large and varied nuclear arsenal, including sub-strategic, low-yield nuclear weapons (no nuclear battlefield weapons), and is apparently not now planning to take the initiative to achieve further reductions of nuclear arsenals (in other words, maintaining and complying with existing treaties is now the highest attainable goal). A change in the attitude of the other nuclear-weapon states (particularly Russia, but also China) will probably be necessary to clear the way for new initiatives. Deterrence can be effective only if there is clear communication about the interests at stake and the consequences that adversaries should expect if they think they can harm these interests. This also most certainly applies to the interests of allies,

whose security policy is based in part on nuclear guarantees. A policy of creating or tolerating ambiguity about nuclear objectives, capabilities and intentions, would seem at odds with clear communication, but this is what all nuclear-weapon states deliberately do in order to mask vulnerabilities and enhance deterrence. That is why NATO has refrained from issuing a no-first-use declaration and maintains several nuclear decision-making centres. Nonetheless, measures to promote uncertainty in the mind of an adversary must not degenerate into deliberate efforts to undermine the foundations of strategic stability

Extended deterrence

The NPR contains the message that the use of nuclear weapons will not go unanswered, even in the case of limited/regional nuclear use not directed against the territory of the United States itself, lest this should be doubted. This message is explicitly addressed to Russia and perhaps also serves as reassurance for Allies who feel threatened by Russia and are less convinced than in the past about the enduring nature of the transatlantic 'coupling' with the United States. Various public hints and statements by President Putin seem to suggest that he is at least intent on increasing the uncertainty in the West about Russian nuclear doctrine and intentions, in the hope that NATO member countries can be intimidated and played off against one another. This is also apparent, for example, from the forward deployment of dual-capable launchers in Kaliningrad, information warfare and exercises involving a mix of conventional, hybrid and nuclear forces. It is therefore important for NATO to show that Russia's intentions will come to nothing. The extended deterrence has helped to prevent more European countries from developing nuclear weapons, and against this background reassurance, too, is still playing a role.

The United States is also demanding that European Allies themselves make a greater contribution to conventional deterrence in Europe and is insisting, as consideration for its commitment to Europe's security, that they fulfil their commitments on defence spending, make a larger contribution to common funding and have a greater share in NATO efforts in general. The NPR also has a clear message for the countries that have aircraft that can be used for both conventional and nuclear missions (DCA): while recognising the importance of the DCA task, it states that if this task is to remain credible it will have to be carried out in future by much more modern aircraft (F-35 / 'fifth-generation' fighter aircraft).

Although the introduction of new sea-launched nuclear weapons may, arguably, reduce the United States' dependence on its European Allies, this does not mean that the DCA task will become unimportant. While it is considered necessary to modernise existing nuclear weapons, the proposed sea-launched nuclear weapons are intended as an addition (and, to some extent, a bargaining chip). The main reasons for continuing to perform the DCA task are: nuclear messaging, the ability to recall or re-task aircraft in flight (unlike missiles), the embodiment of the transatlantic security bond, political burden-sharing in relation to the most controversial security issues, and retaining influence over NATO's nuclear policy. If the Netherlands were to cease performing the DCA task and a NATO country closer to Russia were willing to take it over, this could make the security situation even more unstable since the Kremlin would probably interpret it as a serious provocation.

Hitherto, it is unclear to what extent the new measures (low-yield SLBM and development of a new SLCM) are also intended to influence China's strategic strategy in East Asia. However, this subject has been considered by senior US officials in their commentary on the NPR. China has superiority in terms of intermediate-range missiles

and, unlike the United States, is not bound by the restrictions of the INF Treaty. At present, the US government has been sending out mixed messages about whether it would be willing to provide allies such as South Korea and Japan with better protection from regional nuclear threats, or even whether this is necessary. This raises questions about the nature and extent of the US regional presence. If this uncertainty persists, it is always possible that China may continue to strengthen its position in the region and that Japan (which has the knowledge and resources) will feel obliged to establish a nuclear balance of terror with China.

By analogy, it is conceivable that if such a split were to occur between the United States and its European Allies, this could also create serious doubts in Europe about the US nuclear security guarantees. This could strengthen the calls for Europe to have its own independent nuclear arsenal (with nuclear deterrence policy forming part of the efforts to achieve greater military independence). If that were to happen, failing to give the matter due consideration would be politically and strategically naive, regardless of who is in White House. For a variety of reasons, however, it is hard to imagine a European nuclear force being a feasible alternative in the near future to the security guarantee the US strategic nuclear triad provides to the European Allies. This is about not just political feasibility but also the degree to which a European deterrent would actually have the intended effect.

Credible nuclear deterrence

The most effective way of enhancing the credibility of NATO strategy is to demonstrate the political will to resolutely counter any form of aggression by Russia and other state actors. A crucial factor is the political cohesion of the Alliance. Moreover, while it may be the case that in the event of a large-scale, lengthy conflict, NATO's conventional strength would exceed Russia's, Russia is nonetheless able to assemble a large force very quickly at regional level. Provocations and – unannounced – operations can cause a great deal of damage and must not go without a response. The lowering of the nuclear threshold is compounded first of all by the neglect of the conventional strength of NATO forces. As noted in the previous AIV advisory report 'The Future of NATO and European Security' (AIV advisory report no. 106, October 2017), NATO has taken measures to ensure a larger military presence in Eastern Europe. Further measures to reassess, adjust and increase conventional strength and response capability are now the best way of enhancing the credibility and effectiveness of NATO's nuclear weapons policy of deterrence and war prevention.

Credible nuclear deterrence requires various conceivable defensive options, which an aggressive adversary will have to take into account. The defensive response thus needs flexibility and a certain degree of unpredictability. Flexibility was introduced during the Cold War, from the early 1960s onwards, by the Kennedy administration in order to be able to mount a regional nuclear response to an overwhelming act of aggression. The aim was to prevent a situation in which it would be necessary, in the event of a conflict or escalating military tensions, to decide at an early stage on whether to use strategic nuclear weapons to completely eliminate the adversary's military capabilities (counterforce) and thus minimise losses on one's own side. The strategy of 'flexibility in response' offered nuclear decision-makers various options, including the use of nuclear weapons with very limited yield value (known as nuclear battlefield weapons, including nuclear artillery and nuclear mines) in the hope of delaying for as long as possible the moment when it becomes necessary to decide to implement plans that will have catastrophic consequences for a large part of humanity, with a real risk of unacceptable losses on one's own side.

From the mid-1960s onwards, the logic of Mutual Assured Destruction (MAD) became increasingly compelling as a way of preventing the use of strategic nuclear weapons at all times. Although this raised the use threshold of the most destructive weapons, the drawback was that in order to maintain a credible deterrence even greater reliance had to be placed on the suitability of the sub-strategic part of the arsenal for use in the military theatre. On the assumption that decisions would be made rationally on both sides of the Iron Curtain, it was considered possible to ensure crises moved up the nuclear escalation ladder in a controllable manner. Ever more sophisticated decision-making models were developed for this purpose.

However, these assumptions have been disputed since the 1970s, partly due to the influence of scientific insights into the effects of nuclear weapons (even more devastating than previously thought and calculated) and into the failings of rational human decision-making in times of crisis. Few would now argue that escalation in a military conflict between major nuclear powers can easily be controlled, or that crisis decision-making will take place only in accordance with rational processes. But it remains plausible that, in the absence of 'limited', sub-strategic nuclear options, an adversary is more likely to gain the impression that the will or capacity to actually consider use is lacking, because of the terrible consequences of having to employ strategic nuclear forces ('self-deterrence'). An adversary who counts on this might be more tempted to use aggression and nuclear blackmail to tip the power balance in its favour. In such a case, then, the threshold to a conflict with nuclear escalation risks would actually be lowered. In a nuclear deterrence relationship, it therefore remains preferable to have flexible options rather than be totally reliant on the use of weapons that would probably cause total annihilation (MAD), which a potential adversary would probably view from the outset as an option that is not likely or credible.

Nonetheless, there is every reason to remain critical of nuclear weapons with a relatively small explosive yield, which would lower the use threshold (such as 'miniaturisation' at the time of the Cold War). Those in favour of such weapons argue that they would reduce dependence on outdated nuclear weapons (which cause much greater collateral damage) and could be a cost-effective alternative to conventional capabilities. However, it is necessary to prevent nuclear options (nuclear battlefield weapons) from being regarded as an effective addition to the conventional military arsenal.

Nuclear arms control

Reducing the role of nuclear weapons may perhaps seem a very difficult or even impossible task in view of geopolitical developments and the prevailing mood of pessimism, but, paradoxically, it is precisely in times of mounting tension in post-war East-West relations that arms control has sometimes been an important factor in creating the right conditions for easing tension and successfully reducing arsenals.

As current efforts to promote nuclear arms control are fragmented and deficient, there is a growing tendency to take precautionary military measures. The focus of the non-military alternative should not be confined to consolidating existing treaties. There is a clear need for a constructive strategic dialogue, based on the shared understanding that an armed balance of power requires the acceptance of a certain degree of vulnerability. Pursuing strategic dominance carries an inherent risk of new arms races and destabilisation of the global balance of power.

Breakthroughs in the fields of digital and electronic warfare, missile propulsion, hypersonic projectiles, militarisation of space, and artificial intelligence may

fundamentally disrupt strategic relations between the major powers in the next few decades. Deterrence strategies are already less reliant than in the past on 'traditional' nuclear weapons and their means of delivery. The possession of nuclear weapons and the threat of using them are now part of a much more complex and unclear range of direct and indirect influencing strategies. It is uncertain how long the supposedly stabilising effect of mutual assured destruction between the superpowers can still be relied on.

As a matter of urgency, nuclear-weapon states must now make fresh agreements to prevent intentional or accidental escalation and failure of regional deterrence. New risks associated with the possession and threat of nuclear weapons must be recognised and strong action taken to reduce those risks. The development and deployment of conventional prompt global strike (CPGS), hypersonic glide vehicles and cruise missiles, and artificial intelligence in detection and launch systems could seriously disrupt stability, but they do not fit into the framework of traditional nuclear arms control. Arms control cannot be viewed separately from the broader strategic and security policy agendas of the major nuclear powers. Those powers share the same interest on this front, as new arms races could lead to large-scale waste of scarce resources that could be put to better use for other purposes.

The AIV concludes that promoting consultation between the nuclear powers is paramount. As the governments in question have taken no steps towards negotiations on multilateral nuclear arms control, preparations for consultations could be made by an authoritative international commission, similar to the World Commission on Environment and Development (the Brundtland Commission), which in 1987 published the report entitled 'Our Common Future' on global environmental threats and development issues. Such a commission could outline the path towards fruitful consultations on controlling risks and types and quantities of weapons. The Netherlands could make a proposal to this effect in the United Nations.

Dialogue with Russia

The United States and Russia, which have by far the largest nuclear arsenals, have an obligation first of all to make a serious effort to implement the NPT. It is reasonable to expect them to be open not only about the size and composition of their arsenals but also about the significance and role of their nuclear weapons. Reducing the numbers is, naturally, still of the utmost importance, but the likelihood of achieving this would probably be greater if there were agreement about their strategic role and significance. This should therefore be the initial focus of consultations. A common interest in the desirability of preventing accidents with nuclear weapons and the occurrence of an unintended conflict could foster an atmosphere of trust, in which such matters as the risks of technological advances in weaponry could also be discussed. Such an atmosphere would allow discussion of more conceptual issues as well, for example the importance of nuclear weapons for deterrence and strategic stability, the desirability of having the highest possible nuclear threshold, and the link between nuclear and conventional weapons as well as their fundamental differences. Difficult issues that could be tackled in this context include ballistic missile defence, the advantages and disadvantages of a no-first-use agreement, the tactical use of nuclear weapons and the blurring of the distinction between nuclear and conventional weapons. A degree of agreement on these and other issues seems necessary to achieve a further reduction of nuclear weapons.

Security of nuclear decision-making and launch systems

The security of nuclear decision-making and of the launch systems requires extra consideration. This is not just about the physical security of the units and facilities concerned. The main aim must be to prevent disruption of the observation, communication and control systems by electronic means and cyberattacks. Although part of the solution can be found in automated systems and new digital and analog technologies, human monitoring and judgment remain essential in decisions on the use of nuclear weapons (as near-accidents have shown in the past). Although precautionary measures to ensure the proper functioning of nuclear command and control are necessary for credible deterrence, they should not leave insufficient time for human judgment and decision-making. Additional safeguards such as lower levels of readiness (de-alerting and de-targeting) and redundancy in operating systems (analog and digital) can create procedural scope for verification of decision-making information and consultation, to prevent misconceptions, poor communication and launch procedures that are virtually impossible to abort. Nuclear-weapon states have a responsibility to make every effort to prevent nuclear accidents and unintentional escalation and to provide information about the measures being taken to guarantee this. Consultations on this subject between nuclear adversaries can foster mutual trust, reduce tension and, ultimately, allow progress towards disarmament.

Role of the Netherlands

The Dutch government wants to work actively towards achieving a world without nuclear weapons. Various international agreements apply here: not just acceptance of the nuclear deterrence strategy supported by the Alliance but also the obligations that can lead to nuclear risk reduction and, ultimately, nuclear disarmament. The statement made in various NATO Summit communiqués that ‘as long as nuclear weapons exist, NATO will remain a nuclear alliance’ may not be allowed to block or slow progress towards a world without nuclear weapons. To make an active contribution, the Netherlands could formulate and schedule specific steps designed to avoid acquiescence in the current status quo.

It is certainly in the Netherlands’ interest to take steps in the short term to prevent the actual use of nuclear weapons, whether intentional or accidental. At international level, nuclear risk reduction is already regarded as a priority since the nuclear powers not only seem to be on the brink of a new and costly round of the nuclear arms race, they might lower the threshold for the use of nuclear weapons. The Netherlands could work with like-minded countries to actively and broadly promote the nuclear risk reduction agenda.

As a European country, faced with increased tensions to the east, the Netherlands has an interest in maintaining and strengthening verification and transparency procedures. For that reason alone, the Netherlands should advocate the maintenance (and extension) of bilateral strategic agreements between the United States and Russia. Non-compliance with the INF Treaty and failure to start negotiations on extending the New START Treaty after 2021 should spur Europe to act if no interest is shown by the United States for the time being. The Netherlands could also press for a constructive dialogue to create the right conditions for continuing and revitalising the global (albeit until recently mainly bilateral) nuclear arms control process.

Deterring Russia from using sub-strategic weapons, especially battlefield weapons, must be achieved first and foremost through credible conventional and non-conventional means. The idea of a nuclear war in the Baltic or Black Sea Basin is a devastating prospect for all concerned, including Russia. In view of the uncertainty about the value

placed on the NATO Alliance by the current US administration, Europe should in all circumstances not only adopt a more independent and assertive defence policy but also make a concerted effort in the field of nuclear arms control. Over and above the efforts within NATO (since the transatlantic security relationship remains the most preferable option), it could be worth trying to conduct a dialogue with Russia in the EU context if there is a demonstrable lack of interest on the part of the United States. That would, however, require considerable enhancement of the European conventional military contribution to NATO, as well as greater political unity.

In conclusion

The Netherlands has only limited influence on these developments. However, as a NATO member country and a DCA country that has not shied away from negotiations on the Nuclear Ban Treaty, the Netherlands can influence prioritisation in both nuclear (and nuclear deterrence) policy and nuclear arms control and disarmament, and it can help improve political and diplomatic communications between nuclear-weapon states and non-nuclear-weapon states.

As long as nuclear weapons exist, the main priority for all states should be to prevent them from ever being detonated – intentionally or by accident – anywhere in the world, on account of the unacceptable humanitarian consequences. Strict compliance with and enforcement of the NPT, including the requirement in article VI of that Treaty for all nuclear possessor states to pursue negotiations to achieve general and complete disarmament under strict and effective international control, remains the key aim in the area of nuclear weapons. There is an urgent need for new talks between the nuclear powers. We are at risk of a new arms race which includes nuclear weapons. The 20th-century nuclear arms control treaties and deterrence concepts no longer suffice in the 21st century. There is increased strategic rivalry involving more actors and new weapon systems, and there is a real risk of further nuclear proliferation. There is a lot at stake for Europe, which wants to – and must – take steps towards greater self-reliance, but will for the foreseeable future remain dependent on the United States' deterrence capabilities. Against this background, the AIV believes it is necessary to focus the Netherlands' efforts with regard to nuclear weapons on three areas:

- renewed consultations between the nuclear powers on reducing the role of nuclear weapons and extending and enhancing existing arms control treaties;
- promoting strategic stability through a reduction of tensions, a balanced positioning of military capabilities and risk reduction;
- maintaining transatlantic security cooperation.

The recommendations below elaborate on these three areas.

VI.2 Recommendations

1. The AIV recommends that the Netherlands submit a proposal to the General Assembly of the United Nations to the effect that an authoritative international commission – similar to the World Commission on Environment and Development (the Brundtland Commission), which published the report entitled 'Our Common Future' on global environmental threats and development issues – should outline the path towards agreements on controlling risks, quantities and types of weapons.

2. The Netherlands and other European countries should speak out more forcefully in favour of preserving the INF Treaty. They can call on the two nuclear superpowers to continue working to that end over the next six months (withdrawal process). It is very much in Europe's interests to make effective agreements to prevent an arms race involving intermediate-range weapons, and to involve states other than Russia, particularly China. Should Russia ultimately prove unwilling to negotiate on the removal of weapon systems banned under the INF Treaty, and should the United States subsequently withdraw definitively from the Treaty, NATO should consider further steps. In view of the importance of the INF Treaty for Europe's stability and security, the European NATO member countries should take the lead on this. Through the EU as well, European leaders should make it clear to President Putin that Russia's violation of the INF Treaty is seriously damaging relations with Russia and that such actions will not be without consequences. If required, the AIV is willing to advise on possible further steps if the INF Treaty collapses.
3. The AIV is of the opinion that within NATO the Netherlands should propose opening a strategic dialogue with Russia on shared interests in relation to controlling and reducing nuclear weapons, in order to gradually bring about multilateral nuclear disarmament. Initially, this would focus on confidence-building measures and nuclear risk reduction. A concerted effort to stop further proliferation of nuclear weapons is also key. Ideally, negotiations on the drastic mutual reduction of sub-strategic nuclear weapons should lead to their total elimination from Europe (including the European part of Russia). Within NATO, the Netherlands could take the lead in initiating these negotiations, but the talks must not jeopardise the security of our country or the Alliance.
4. The Netherlands must fulfil its obligations as agreed within NATO concerning conventional military capabilities. The prevention of war is based on a balanced mix of diplomatic conflict management and deterrence. A substantial enhancement of NATO's conventional capabilities in Europe and compliance with NATO obligations are crucial in order for Allied policy aimed at preventing war to be credible and effective. Balanced conventional capabilities in Europe reduce the risk of a military conflict between Russia and NATO and with it, the risk of nuclear weapons being used. A solid conventional defence not only raises the nuclear threshold but also provides opportunities for arms control and disarmament.
5. Partly in the light of the United States' current foreign policy, which is weakening the international multilateral order, there must be scope for discussion on greater European military self-reliance. Europe is dependent on the US military, both in conventional and nuclear terms. This is not expected to change in the near future. A strong security relationship with the United States therefore remains essential for Europe. The AIV would consider it highly undesirable for new nuclear-weapon states to emerge in Europe.
6. For military and, above all, political reasons, having only US nuclear assets that are not stationed in Europe to fall back on for the implementation of NATO's nuclear policy is undesirable, not least due to the current state of relations within the Alliance. By making their fighter aircraft available for possible nuclear operations, European governments demonstrate their willingness to take on extra responsibility, which strengthens the credibility of NATO's defence. Against that background, in the light of the international security situation and given the importance of continued Allied burden-sharing, the AIV recommends that the current nuclear task of the Dutch

fighter aircraft (the DCA task) be maintained when the F-35 replaces the F-16. The AIV calls for as much information as possible to be made available in the decision-making process on the continuation of the nuclear task.

7. The AIV considers it important for NATO to continue conducting thorough exercises for the procedures regarding nuclear weapons, using generic scenarios. This also applies to the procedures surrounding political decision-making and operational readiness. Regular procedural exercises are important in relation to not only the credibility of the deterrence but also risk reduction, with a view to avoiding unintentional use, for instance due to miscommunication between decision-makers or as the result of an accident.
8. The modernisation of systems for nuclear decision-making and communication includes the use of digital technologies and possibly, in the future, artificial intelligence. To prevent the unintentional use of nuclear weapons, the AIV considers it essential that the states that possess nuclear weapons have access to direct and reliable means of communications (hotlines). Artificial intelligence can help speed up the creation of an accurate picture of the situation in a complex environment in which there is a lot of information to process, but it can also entail new risks. This underscores the importance of meaningful human intervention, assessment and decision-making in this respect.
9. It is important to improve knowledge of and information sharing on NATO's nuclear policy. NATO and the governments of its member countries should make a much greater effort to explain NATO's nuclear and security policy and provide information about all the relevant facts.
10. The AIV, aware of the Netherlands' limited direct influence at global level, believes that continuation of the multilateral process of arms control, including non-proliferation, whether it be led by the United States or not, is of crucial importance, from both a global and national point of view. The Netherlands can contribute to this – particularly in the context of the Non-Proliferation Treaty – in a variety of ways: by using its good knowledge position to participate in a wide network within the global arms control community, by working with like-minded actors, by emphasising the importance of nuclear arms control in its bilateral contacts with the United States and other countries, by stressing the responsibility inherent in the protective, example-setting role of key countries, and – where it can operate as a bridge builder – by seizing every opportunity to facilitate dialogue as concretely as possible.

Request for advice

Professor Jaap de Hoop Scheffer
Chairman of the Advisory Council
on International Affairs
P.O. Box 20061
2500 EB The Hague

Date 15 March 2018

Re Request for advice on the future role of nuclear weapons

Dear Professor De Hoop Scheffer,

The shifting international situation requires us to reflect on the current and future role of nuclear weapons. Geopolitical and technological changes and changes in nuclear doctrine in particular impel us to rethink NATO's current nuclear policy and the Netherlands' policy as a member of the Alliance.

NATO is a nuclear alliance. Its Deterrence and Defence Posture Review (2012) states that its greatest responsibility is to protect and defend its territory and our populations against attack of any kind. The three nuclear powers in the Alliance – the US, the UK and France – play a central part in NATO nuclear policy, but every other NATO member has a contribution to make to this policy as well. At the same time, the Alliance states that the circumstances in which any use of nuclear weapons might have to be contemplated are extremely remote. Nuclear non-proliferation also plays an important role in the achievement of the Alliance's security objectives, and NATO is resolved to create the conditions for a world without nuclear weapons.

As a member of NATO, the Netherlands has a nuclear mission. One squadron of Dutch F-16 fighter aircraft is charged with this mission, and the F-35s ordered to replace the F-16s are intended to take it over. In addition to meeting its NATO obligations, the Netherlands gives high priority to working on arms control and disarmament. A Dutch diplomat was for example the Chair in 2017 of the Preparatory Committee for the 2020 (Review Conference of the Parties to the Treaty on the Non-Proliferation of Nuclear Weapons). The Netherlands also plays an active role in the Fissile Material Cut-off Treaty (FMCT), the Comprehensive Nuclear-Test-Ban Treaty (CTBT), the Non-Proliferation and Disarmament Initiative (NPDI) and the International Partnership for Nuclear Disarmament Verification (IPNDV).

After the end of the Cold War, the number of nuclear weapons declined worldwide, and they came to play a subordinate role for NATO and Russia, both militarily and politically. During that same period, nuclear expertise, familiarity with nuclear issues, nuclear deterrence and nuclear arms control also declined. In recent years, however, more states have been trying to acquire nuclear arms, and nuclear weapon states have been modernising their arsenals. Moreover, in the defence doctrine Russia adopted in 2014 it assigns a major role to nuclear weapons, including in an offensive capacity. This can have consequences for the European security situation. In addition, there is a range of challenges around the world in the field of nuclear proliferation, with North Korea as the most obvious problem. The United States, a NATO ally, also once again assigns a greater role to nuclear weapons for its national security in its most recent Nuclear Posture Review (2018).

Against the backdrop of this shifting international landscape, the Dutch government needs a thorough analysis of the current and future role of nuclear weapons and of the appropriate role for NATO in general, and the Netherlands in particular, in this area. The Ministers of Foreign Affairs and of Defence therefore request that the AIV issue an advisory report on this subject, with specific attention to the following questions:

1. What is the AIV's assessment of NATO's nuclear security situation, in the light of the geopolitical and technological changes and changes in nuclear doctrine in the Euro-Atlantic region and beyond? Specifically, how does it assess the consequences for NATO of nuclear and ballistic missile developments in Russia? Furthermore, what are the consequences of the nuclear aspirations of, and nuclear developments in, North Korea, Iran and possibly other countries as well? What role do non-state actors play in this security situation?
2. To what extent are NATO's nuclear doctrine, nuclear policy and nuclear capabilities equal to these challenges? How can NATO ensure that its nuclear policy can be successfully implemented? What relation do NATO's conventional defence policy and conventional capabilities bear to its nuclear policy and capabilities?
3. How does the AIV assess NATO's role in the field of nuclear arms control, disarmament and non-proliferation? How closely does NATO's nuclear policy correspond to its values and aims in this area? What practical opportunities are there to help create the conditions for a world without nuclear weapons?
4. What part do the three nuclear weapon states play in NATO, and how do their national nuclear doctrines influence the overarching nuclear policy of the Alliance? What is the role in NATO nuclear policy of American sub-strategic nuclear weapons deployed in Europe? What value should NATO place on the concept of burden sharing?
5. Like all other NATO member countries, the Netherlands has a nuclear mission as part of the Alliance. How can the Netherlands carry out this NATO mission properly? What value should the Netherlands place on the concept of burden sharing?
6. Preventing nuclear incidents and accidents and the use of nuclear weapons as a result of miscalculation or miscommunication promotes the security of the Alliance. How can NATO contribute to nuclear risk reduction?

This request for advice has been included in the AIV's programme of work for 2017-2019. We look forward to receiving your report. We would be particularly pleased to receive it before the NATO Summit set for mid-July 2018.

Yours sincerely,

Stef Blok
Minister of Foreign Affairs

Ank Bijleveld-Schouten
Minister of Defence

Historical overview of nuclear deterrence and nuclear arms control

Emergence of the Cold War

The debate on the utility, or lack thereof, of nuclear weapons dates back to their introduction at the end of the Second World War. The first and so far only use of such weapons forced Japan to capitulate, bringing an end to the war. On 6 August 1945, a US B-29 bomber dropped an atomic bomb with an explosive yield equivalent to that of 15,000 tonnes of TNT (15 kilotons or kt) on the Japanese city of Hiroshima. Three days later, a second bomb of a different type, with an explosive yield of 22kt, was dropped on the Japanese city of Nagasaki. Faced with the enormous destructive power of these weapons,¹ various observers quickly concluded that the nature of warfare between countries that possessed such weapons would change fundamentally. In strategic thinking, the role of military deterrence came to be seen in a different light. The emphasis could no longer be on winning armed conflicts; instead, attention would have to shift to their prevention.² This idea took hold after the Second World War as a result of rapid nuclear developments in the United States and the Soviet Union and the ever-present threat of confrontation between the only two remaining military superpowers.

The main component of the Soviet threat was considered to be that country's ultimate objective of spreading communism around the world. In light of the prevailing balance of power, containment of further Soviet expansion was considered the most feasible option.³ The politico-military dimension of this strategy crystallised with the establishment of NATO in April 1949 and the build-up of a military arsenal that was potentially so destructive that it would force any opponent to exercise military restraint. The Soviet Union did everything in its power to prevent the West from permanently tipping the strategic balance in its favour. Following the Soviet Union's first successful test of a nuclear fission bomb on 12 August 1949, US President Harry S. Truman decided to speed up the development of a (much more powerful) thermonuclear hydrogen bomb and to expand the US arsenal with smaller, tactical nuclear fission bombs. The resulting nuclear arms race produced a delicate balance of terror in which nuclear weapons helped prevent war as long as both sides continued to instil sufficient fear in each other.⁴

1 It is estimated that this relatively small nuclear bomb on Hiroshima caused 66,000-150,000 direct fatalities. The total number of casualties (including long-term effects) may actually exceed 250,000. See <<http://www.pewresearch.org/fact-tank/2015/08/04/70-years-after-hiroshima-opinions-have-shifted-on-use-of-atomic-bomb>> and <<http://edition.cnn.com/2007/WORLD/asiapcf/08/05/hiroshima.anniversary.reut/index.html>>.

2 'Thus far the chief purpose of our military establishment has been to win wars. From now on its chief purpose must be to avert them'. Bernard Brodie, ed., *The Absolute Weapon: Atomic Power and World Order*, New York, 1946.

3 This strategy is attributed to George F. Kennan. In 1946, as a diplomat stationed in Moscow, he sent his now-famous 'long telegram' on the aggressive nature of Stalin's foreign policy. In 1947, *Foreign Affairs* published an article by Kennan under the pseudonym 'Mr. X'. His conclusion was that 'the main element of any United States policy toward the Soviet Union must be that of a long-term patient but firm and vigilant containment of Russian expansive tendencies.' See: <<https://history.state.gov/departmenthistory/short-history/kennan>>.

4 Albert Wohlstetter, 'The Delicate Balance of Terror', RAND Corporation, 1958.

Following North Korea's Soviet-backed invasion of South Korea in 1950, concerns regarding Western Europe's limited ability to fend off a military attack from the East increased. Whereas NATO strategy initially focused on a 'shield' of conventional European forces and the 'sword' of a potential US nuclear counterattack, after 1954 the emphasis shifted to deterrence through massive nuclear retaliation. It became clear that the European countries would not, within an acceptable timescale, be able to mobilise a credible conventional defence that would be able to match the Soviet Union's numerically strong armed forces in Eastern Europe. During the course of 1953, US President Dwight D. Eisenhower had established the 'New Look' doctrine. One of the basic principles of this new doctrine was the idea that the build-up of the United States' nuclear arsenal and its use of strategic air power would mean that fewer conventional forces would be needed. As far as European security was concerned, relatively inexpensive nuclear forces, including an arsenal of tactical nuclear weapons, offered an alternative means of responding to a large-scale Soviet attack in its early stages. With its strategic air forces, which could reach targets in the Soviet hinterland, the United States could bring the aggressor to its knees in any scenario.

Strategic and sub-strategic nuclear weapons

Since the beginning of the Cold War, the terms 'strategic' and 'tactical' have often been used to distinguish between different types of nuclear weapons, although neither term has an authoritative definition. Nuclear adversaries have different views on the roles of such weapons in their arsenals and deliberately foster ambiguity regarding specific characteristics, deployment options and intentions. Nevertheless, the division of nuclear weapons into categories can contribute to the credibility of deterrence, prevent confusion and misperceptions, and even contribute to the conclusion of arms control treaties. Specific nuclear weapons may also be categorised and stigmatised in the context of public debate (e.g. 'stop the neutron bomb', 'no to battlefield weapons in Europe'.)

In the AIV's view, the use of any nuclear weapon, regardless of its characteristics, fundamentally changes the nature of a conflict and therefore always has a strategic significance. In addition to the strategic offensive nuclear weapons listed in the arms control treaties, there is a mixed category of other nuclear weapons that are described as 'tactical' or – increasingly – as 'sub-strategic' or 'non-strategic'. All three of these terms seem to imply that the threat or use of these nuclear weapons is neither based on political considerations nor encumbered by strategic implications. The AIV considers 'sub-strategic' to be the least problematic term: 'non-strategic' is unsuitable because it contains an explicit negation, while the original military meaning of 'tactical' encompasses the use of armed force of limited duration, scope and impact or the delegation of the authority to launch an attack to a lower level. Where there is a risk of confusion, however, the terms used in the original context or sources have been maintained. For example, Russia continues to regard tactical nuclear weapons integrated into conventional military units as an important part its nuclear arsenal. In a military context, the general distinction between the strategic and tactical use of weapons also remains relevant.

At this time, the Soviet Union, which from 1955 onwards was allied with the communist countries of Eastern Europe in the Warsaw Pact, already possessed long-range bombers and deployed intermediate-range missiles (SS-3) aimed at targets in Western Europe. A year after Soviet forces invaded Hungary and a few months after the Soviet Union tested the world's first intercontinental missile (the SS-6, which was modified to launch the first-ever satellite, Sputnik, into orbit), the NATO Council decided in December 1957 to equip NATO forces in Europe with tactical nuclear weapons, which would be stored under US control in several

Western European countries. In addition, it decided to deploy Thor and Jupiter intermediate-range missiles to counterbalance Russia's SS-3, SS-4 and SS-5 missiles. (In practice, all these missiles would be withdrawn in 1963 following the Cuban Missile Crisis.) During the 1950s and 1960s, NATO thus amassed a wide variety of tactical nuclear warheads that could be launched by means of various air-, sea- and land-based weapon systems. In 1958, the government of Prime Minister Willem Drees decided that the Netherlands would also assume nuclear tasks.⁵ On 6 May 1959, the government of Prime Minister Jan de Quay signed a bilateral agreement to this end with the United States, also taking over some of the United States' dual-capable means of delivery. The Netherlands' first nuclear tasks consisted of the creation of a battalion of Honest John short-range missiles within the army and a battalion of Nike anti-aircraft missiles within the air force in the framework of the Mutual Defense Aid Program, as well as preparing an air force squadron of F-84F Thunderstreak fighter-bombers to carry and launch Mk-7 tactical nuclear bombs.⁶

From massive retaliation to flexibility in response

At the beginning of the 1960s, the strategy of massive retaliation began to be challenged. Influenced in part by the critical analysis of General Maxwell D. Taylor, President John F. Kennedy and Secretary of Defence Robert McNamara believed that it offered little benefit.⁷ The experience of the Cuban Missile Crisis in October 1962 reinforced the Kennedy administration's critical views on massive retaliation. Although the coupling of European and US security achieved by the deployment of tactical nuclear weapons gave the European countries more certainty, it also created a new vulnerability. Instead of providing for a graduated response to armed aggression, the strategy was based on a near-automatic process of nuclear escalation, meaning that a minor dispute or an incorrect assessment could potentially result in the destruction of US and other strategic assets and a large-scale nuclear war. Decision-making in crisis situations had thus become a highly complex and risky enterprise. If a war could not be won in the traditional sense, the only remaining question was when to use or threaten to use nuclear weapons to deny an opponent the strategic initiative. In the unlikely event of an actual nuclear confrontation, the main question was how to limit the damage as much as possible. Scientists and strategists developed increasingly sophisticated scenarios to clarify the dilemmas of nuclear deterrence and determine how policymakers – assuming rational decision-making – could effectively influence an opponent's

5 In the Netherlands, the term 'nuclear task' relates to the means by which nuclear weapons are delivered to their targets, because the weapons themselves always remained under US control. The Dutch nuclear forces became dual-capable, which means they were adapted to perform both nuclear and conventional missions. In total, the Netherlands would assume six nuclear delivery tasks: air-launched nuclear bombs, artillery shells, short- and medium-range missiles, air defence missiles, anti-submarine depth charges and atomic demolition munitions (ADMs). For an overview, see: Publicatie Nederlandse Atlantische Commissie '*Nederland en de Kernwapens: Een studie over het Nederlands nucleair beleid 1972-1983*', Alphen aan den Rijn, 1987, pp. 24-25.

6 D. Starink, 'De Nuclearisering van de Krijgsmacht', in B. Schoemaker and J.A.M.M. Janssen, eds., in *In de Schaduw van de Muur: Maatschappij en Krijgsmacht rond 1960*, The Hague, 1997, pp. 82-99.

7 Taylor had listed his objections to this strategy in General Maxwell D. Taylor, *The Uncertain Trumpet*, New York, 1960. President Kennedy appointed Taylor as Chairman of the Joint Chiefs of Staff in 1962.

calculations in such a strategic setting.⁸

In 1962, NATO Secretary-General Dirk Stikker presented the *Special Report on NATO Defence Policy* regarding nuclear consultation (which gave rise to the so-called Athens Guidelines). In practice, it proved difficult to grant European Allies that played an important role in nuclear sharing but did not possess nuclear weapons of their own a say in nuclear decision-making. Washington wanted to retain as much control as possible in this area but equally feared that European Allies that lacked faith in extended deterrence would seek to acquire their own nuclear weapons.⁹ Ambitious initiatives such as the US proposal to establish a nuclear-armed Multilateral Force (MLF) consisting of multinational units, and a British proposal for an Atlantic Nuclear Force under NATO command, offered alternatives to nuclear sharing but ultimately proved a bridge too far.¹⁰ In 1966, in order to accommodate the wish of the Federal Republic of Germany in particular – but also countries like Italy and Turkey – to have a say in nuclear decision-making, the United States and the United Kingdom agreed to the establishment of a Nuclear Planning Working Group, which changed its name to the Nuclear Planning Group (NPG) on 6 April 1967.

In the 1960s, there was a growing awareness that deterrence required a certain amount of uncertainty and a willingness to escalate but that rigorous control procedures and predictable behaviour were needed to prevent accidents and irrational conduct. On the other hand, the arms race was still being driven by the desire to have the capability – in cases where military confrontation threatened to become unavoidable (if deterrence should fail) – to carry out a pre-emptive strike on an opponent if necessary that would be so overwhelming that unacceptable losses or a devastating attack would be averted (anticipatory self-defence aimed at preventing a ‘nuclear Pearl Harbour’). However, the introduction by both sides of thermonuclear warheads,¹¹ intercontinental missiles deployed in underground silos, and nuclear-powered submarines with an almost unlimited range made it increasingly unlikely that either side would emerge relatively unscathed from a military confrontation. From the mid-1960s onwards, this stalemate was referred to as mutual assured destruction

8 The RAND Corporation is a US government-funded think tank whose work on the application of rational choice theory and game theory to questions of nuclear deterrence became world famous. In addition to the aforementioned Bernard Brodie and Albert Wohlstetter, scholars such as Herman Kahn and Thomas Schelling also worked for RAND. In 2005, Schelling and Robert Aumann jointly received the Nobel Prize in Economics for their work on developing game theory to explain strategic behaviour, which has its origins in the early decades of the Cold War.

9 Extended deterrence concerns the guarantee that aggression against an Ally that does not possess nuclear weapons will be halted, if necessary using the United States’ nuclear arsenal. Critics have pointed out that this form of nuclear deterrence is less credible than central deterrence. After all, aggression against a country’s own territory forms the ultimate motive for self-defence by all available means.

10 William Alberque, ‘The NPT and the Origins of NATO’s Nuclear Sharing Arrangements’, *Proliferation Papers*, no. 57, Ifri, February 2017.

11 The explosive yield of the nuclear fission bombs dropped on Hiroshima and Nagasaki is dwarfed by that of thermonuclear hydrogen bombs, which have an explosive yield equivalent to that of several megatons of TNT. On 30 October 1961, the Soviet Union created the largest explosion ever recorded by detonating a 50 megaton (or 57 megaton according to the United States) hydrogen bomb during a weapons test over Novaya Zemlya.

(MAD). The military balance of power between the United States and the Soviet Union was approaching nuclear parity: two equal nuclear arsenals based on a triad of long-range bombers, intercontinental missiles and submarine-launched ballistic missiles. Mutual assured destruction implied an invulnerable second-strike capability, that is to say, the certainty that unacceptable losses could still be inflicted on the aggressor following a first strike, if necessary 'from beyond the grave'. Against this background, the composition, size and positioning of the nuclear arsenals gradually became the subject of diplomatic efforts aimed at preventing any disturbance of the balance of power.¹² An example of this was the signing of the Outer Space Treaty in 1967. This treaty prohibited the deployment of nuclear weapons and other weapons of mass destruction in space, thus preventing a new arms race.¹³ During the second half of the 1960s, both sides also became increasingly willing to impose restrictions on defensive anti-ballistic missile systems (ABMs), which could undermine the effectiveness of second-strike capabilities.

It would take until the end of 1967 for NATO to replace its strategy of massive retaliation with one based on flexibility in response. The European Allies initially opposed what they regarded as a separation of the tactical and strategic components of NATO's nuclear deterrence capability. According to the Federal Republic of Germany and other countries, displaying a willingness to consider using nuclear weapons in the early stages of a conflict was necessary to avoid unintentionally creating the impression that limited aggression by the Warsaw Pact would go unpunished. In contrast, the United States wanted to control the timing of nuclear escalation and be able to postpone it if necessary. In 1962, the United Kingdom had accepted an offer to equip its strategic submarine capability with US Polaris missiles, on condition that the missiles would be placed under NATO command and could only be used in defence of national security as a last resort. In an attempt to check French nuclear ambitions, Washington had unsuccessfully made a similar offer to Paris. France, which in 1957 had proposed establishing a Western European nuclear force as an alternative to the transatlantic coupling with the United States, remained vehemently opposed to the US proposals. In March 1966, President Charles de Gaulle decided to withdraw the French armed forces from NATO's integrated military structure and retain control over France's strategic capabilities.

France's military withdrawal paved the way for a compromise, which was approved by the NATO Council in December 1967 and laid down in Document MC 14/3.¹⁴ The objectives of the new strategy were as follows:

- meet initially any aggression short of general nuclear attack with a direct defence at the level – conventional or nuclear – chosen by the aggressor;
- conduct a deliberate escalation if aggression cannot be contained and the situation restored by direct defence;
- initiate an appropriate general nuclear response to a major nuclear attack.

In essence, the new strategy meant that, if deterrence failed, nuclear weapons could be used on a limited scale to help end the hostilities and prevent escalation towards a large-scale nuclear war (thus 'restoring' deterrence). As part of this strategy, the Soviet Union was deliberately left in the dark as to what conventional measures and tactical or strategic

¹² Lawrence Freedman, *Deterrence*, Cambridge, 2004, pp. 17-19.

¹³ See: <<http://www.unoosa.org/oosa/en/ourwork/spacelaw/treaties/introouterspacetreaty.html>>.

¹⁴ The document can be consulted at: <<https://www.nato.int/archives/strategy.htm>>.

nuclear weapons it should be prepared to deal with at any given time.

Following the introduction of the new strategy, attention could be shifted from the basic principles of transatlantic security cooperation to what controlled escalation would require in terms of the deployment of nuclear weapons.¹⁵ The debate focused on the theatre nuclear forces (TNF), i.e. the nuclear weapons designated for use in the European theatre. At the same time, the adoption of the Report on the Future Tasks of the Alliance (also known as the Harmel Report) heralded the beginning of a new phase in the Cold War. This report, which was prepared by a committee led by Belgian foreign minister Pierre Harmel, highlighted the importance of a two-track policy: from now on NATO would focus not only on deterrence and defence but also on diplomacy and détente. Among other things, the report advocated a balanced force reduction for the Warsaw Pact and NATO, with a view to resolving the issues that had been dividing Europe, and Germany in particular, for two decades.¹⁶ Within a few years, this new approach also yielded results in the area of nuclear disarmament, after the leaders of the United States and the Soviet Union launched bilateral strategic arms control negotiations in Helsinki in November 1969.

Transformation of the debate in the early 1970s

Détente and deterrence

The continued difference of opinion on extended deterrence, in particular with regard to the role of tactical nuclear weapons in European security, became apparent during the 1970s in the discussions on the proposal to introduce an enhanced radiation reduced blast (ERRB) weapon (a neutron bomb) and modernise intermediate-range nuclear weapons (deploying cruise missiles and replacing the Pershing I-A missiles in response to Russia's deployment of SS-20 missiles within striking distance of Europe). The relevant decisions were made against a background of increased concern among politicians and within society regarding the risks associated with nuclear weapons and a loss of confidence in the war-preventing effect of nuclear deterrence ('nuclear peace'). This applied to the United States as well as to European NATO countries, including the Netherlands. The inaugural policy statement of the government of Prime Minister Barend Biesheuvel (1971-1973) was the first to refer to 'reducing the role of nuclear weapons'. The entry into office of the government of Prime Minister Joop den Uyl in 1973 coincided with the beginning of a period of clearly reduced tension. The previous year, the United States and the Soviet Union had signed the Strategic Arms Limitation Treaty (SALT), the first arms control treaty aimed at limiting strategic nuclear weapons, which imposed restrictions on defensive anti-ballistic missile (ABM) systems and land- and submarine-based offensive strategic missiles.

The Dutch government's policy document on disarmament and security ('Disarmament White Paper') of 19 June 1975 placed arms control and disarmament at the forefront of Dutch nuclear policy. One of its main objectives was to reduce the role of short-range battlefield weapons. The policy document did not question the flexible response strategy, the need for deterrence or the Netherlands' membership of NATO as such. In fact, it stated that NATO formed the framework within which a policy of détente should be actively pursued: unilateral denuclearisation was not an objective of the policy. The desire to reduce the role

15 Publicatie Nederlandse Atlantische Commissie, 'Nederland en de Kernwapens. Een studie over het Nederlands nucleair beleid 1972-1983', Den Haag, 1987, p. 40.

16 The negotiations between NATO and the Warsaw Pact on conventional force reductions in Europe, known as Mutual and Balanced Force Reductions (MBFR), commenced on 30 October 1973.

of nuclear weapons meant that plans for a Western European nuclear force or the introduction of miniature nuclear weapons were rejected. In the policy document, the government followed the advice of the Netherlands Institute for Peace Studies (NIVV) of June 1974 not to advocate a unilateral or reciprocal 'no first use' declaration.¹⁷ Subsequent governments continued to support the principles of nuclear arms control, of reducing the role of and risks associated with nuclear weapons, and of limiting the Netherlands' own nuclear tasks. However, the scope for practical policy measures remained limited and continued to depend on international developments, including the need, as recognised by NATO, to modernise the nuclear weapons deployed in Europe.

NATO's double-track decision

After it became apparent that opposition to the introduction of ERFB weapons was too strong and US President Jimmy Carter decided in 1978 not to start producing neutron bombs for the time being, it was primarily the Federal Republic of Germany, with support from the United Kingdom, that pushed for the development of alternative means to strengthen the nuclear forces in Europe. In 1979, based on the findings of various research groups, NATO concluded that the most appropriate way to close the supposed gap between tactical nuclear weapons and the United States' strategic armed forces was to deploy ground-launched cruise missiles (GLCMs) and replace the aging Pershing I-A missiles with Pershing II missiles, which had a range of 1,800km. Supporters argued that deploying these missiles in Europe had become a matter of urgency, owing in particular to the Soviet Union's deployment of mobile SS-20 missiles within striking distance of Europe and the introduction of its new Backfire bomber. At the same time, opposition to the modernisation plans was growing. At the request of West Germany, which was supported in this by the Netherlands, NATO established a Special Group on arms control to examine options in this area. This parallel effort led to the adoption of NATO's double-track decision on 12 December 1979. The decision provided for the deployment of 108 Pershing II missiles in Germany and 464 Tomahawk GLCMs in Germany, the United Kingdom, Italy, the Netherlands and Belgium. Forty-eight GLCMs were to be deployed in the Netherlands. The deployment of these missiles was to be accompanied by a simultaneous reduction in the number of nuclear warheads in Europe by 1,000 (including those used in nuclear artillery and atomic demolition munitions (ADMs)), as well as a set of negotiating proposals that, if accepted, would ultimately result in the withdrawal of the missiles.

Dutch decision-making on the issue of cruise missiles

At the time of the adoption of the double-track decision, the government of Prime Minister Dries van Agt was still compelled to attach a reservation to the proposal to deploy cruise missiles in the Netherlands. Since the beginning of the debate on the neutron bomb, public opinion had increasingly turned against nuclear weapons. The government and the coalition parties had been reluctant to stake out a firm position owing to internal disagreements. As a result, those opposed to nuclear weapons had had faced relatively little resistance, and it was no longer possible to change the tone of the political debate. By the autumn of 1979, the options for amending the modernisation plans had declined sharply at international level. In its reservation, the Netherlands announced that it would make a decision in December 1981, depending on the outcome of the arms control talks. In addition, it stated that the deployment of new weapon systems should be accompanied by a reduction in the Netherlands' existing nuclear tasks. In practice, the deferral of the Netherlands' decision lasted until the end of 1985. In the intervening years, it became apparent that the plan to

17 Publicatie Nederlandse Atlantische Commissie, 'Nederland en de Kernwapens. Een studie over het Nederlands nucleair beleid 1972-1983', Den Haag, 1987, p. 70.

deploy GLCMs in the Netherlands had generated a social and political storm, due in part to the efforts of the peace movement led by the Interchurch Peace Council (IKV). The peace movement aspired to a nuclear-free Europe, if necessary by starting unilateral disarmament initiatives in the Netherlands. Two mass demonstrations were organised to oppose the deployment of cruise missiles by NATO.¹⁸ In 1985, these demonstrations were followed by a petition opposing the deployment of cruise missiles and Pershing II missiles. Garnering 3.7 million signatures, it was presented to Prime Minister Ruud Lubbers in November of that year.

Lubbers managed to break the political deadlock by means of a provisional decision in favour of deploying the cruise missiles, coupled with the discontinuation of some of the Netherlands' other nuclear tasks. On 1 June 1984, the government decided to deploy 48 cruise missiles at Woensdrecht air base, on the understanding that it would reverse this decision if the Soviet Union possessed fewer than 378 SS-20 missiles on 1 November 1985. This approach met with support in the House of Representatives. Incidentally, the above-mentioned deadline was the last possible date in NATO's deployment schedule. On 1 November 1985, the government announced its final decision on the deployment of cruise missiles and on other nuclear tasks in a letter to parliament,¹⁹ in which it noted that the Soviet Union had proved unwilling to comply with the Netherlands' aspirations in the field of arms control and arms reduction. Besides the decision in favour of deploying 48 cruise missiles in the Netherlands, for which purpose an agreement would be concluded with the United States as soon as possible, the letter mentioned the Netherlands' intention to discontinue the nuclear tasks of the Orion maritime patrol aircraft (delivering anti-submarine depth bombs) and the F-16 fighter aircraft (delivering air-to-ground gravity bombs) simultaneously with the actual stationing of the cruise missiles. In light of the Montebello Decision, however, the government felt that it would not be prudent to discontinue or reduce the nuclear tasks performed by Lance missiles and 8-inch howitzer artillery.²⁰ In a letter to parliament of 2 December 1985, the government announced that it intended to implement its decision to unilaterally discontinue the nuclear tasks of the F-16 and the Orion despite the objections of the Allies it had consulted and their request that it reconsider the relevant policy proposals. This proved that the decision was primarily rooted in domestic political considerations. By acting before other countries implemented the Montebello Decision, the Netherlands thwarted NATO's pursuit of a coordinated reduction of tactical nuclear weapons. NATO regarded the elimination of the nuclear task of the F-16, in particular, as incompatible with a strategy based on flexibility in response, because doing so undermined its ability to

18 Following a demonstration attended by 400,000 people in Amsterdam on 21 November 1981, the largest ever demonstration in Dutch history took place in The Hague on 29 October 1983, attended by 550,000 people.

19 Parliamentary Paper, House of Representatives, 1985-1986, 17 980, no. 24 (cruise missiles). Letter to parliament from the Prime Minister, also writing in his capacity as the Minister of General Affairs, the Minister of Foreign Affairs and the Minister of Defence.

20 At a meeting in Montebello in October 1983, NATO's Nuclear Planning Group (NPG) approved a report outlining the future need for nuclear weapons with a shorter range than the existing long-range intermediate nuclear forces (LRINF). On the basis of this report, the ministers decided, on the eve of the deployment of the first Pershing II missiles and Tomahawk GLCMs, to reduce the number of nuclear weapons in Europe by 1,400 – to approximately 4,600 – between 1983 and 1988. This reduction focused mainly on the Honest John and Nike missile systems and the ADMs, which the report had found to be less effective.

control escalation by ending a conflict using the lowest possible level of force.²¹

The agreement concerning the deployment of a unit of US Air Force ground-launched cruise missiles in the Netherlands was concluded through an exchange of letters between the Netherlands and the United States on 4 November 1985. Unlike in the case of the existing Dutch nuclear tasks, in which the means of delivery belonged to the Netherlands, the weapons and launch installations remained entirely in US hands. Following the conclusion of the agreement, work was started on the construction and equipment of the Woensdrecht air base, for which preparations were already complete. The deployment schedule provided for the deployment of Tomahawk cruise missiles in mid-1988, but this never came to pass. On 8 December 1987, US President Ronald Reagan and Soviet leader Mikhail Gorbachev signed the Intermediate-Range Nuclear Forces Treaty (INF Treaty) in Washington. The negotiations that led to the treaty had started in 1981, in response to NATO's double-track decision, which signalled its determination to respond to the deployment of the SS-20 as well as a willingness to negotiate. The Soviet Union realised that it had more to gain from agreeing to verified, reciprocal limitations than from adopting additional measures in response to the modernisation drive announced by NATO.²² The INF Treaty provided for the elimination of all US and Soviet land-based missile systems with a range of 500-5,000km within a period of three years. In a letter to parliament concerning the INF Treaty, the government announced that it had decided to maintain the nuclear tasks of the F-16 and the Orion, given that it had linked their discontinuation to the deployment of cruise missiles in its decision of 1 November 1985.

Reduced role of nuclear weapons following the end of the Cold War

Discontinuation of the Netherlands' nuclear tasks, with one exception

East-West relations improved significantly following the summit meeting between Reagan and Gorbachev in Moscow in May 1988. In March 1989, arms control negotiations on conventional armed forces in Europe (CFE) and confidence- and security-building measures (CSBMs) were launched in Vienna. At a summit meeting in Brussels on 29-30 May 1989, the heads of state and government of the NATO member countries adopted a comprehensive concept of arms control and disarmament, which stated that negotiations on a partial reduction of land-based short-range nuclear weapons could be initiated following the completion of a CFE agreement. The planned modernisation of the Lance missile system would also be discussed in this context. The fall of the Berlin Wall on 9 November 1989 accelerated these developments and triggered negotiations on German reunification. On 3 May 1990, on the eve of the NATO summit meeting in London, US President George Bush announced that he had halted the modernisation programmes for 155mm nuclear artillery shells and the Lance missile system. On 6 July 1990, the heads of state and government of the NATO member countries assembled in London issued a declaration in which they expressed their willingness to renounce short-range nuclear weapons (artillery) and enter into negotiations on this issue as soon as possible following the signature of the CFE Treaty. German reunification took effect with the entry into force of the Unification Treaty on 3 October 1990.

On 9 March 1991, Dutch Minister of Defence Relus ter Beek published a Defence White Paper stating that NATO's intention to eliminate all nuclear artillery shells from Europe,

21 Publicatie Nederlandse Atlantische Commissie, 'Nederland en de Kernwapens. Een studie over het Nederlands nucleair beleid 1972-1983', Den Haag, 1987, pp. 183-184.

22 Willem van Eekelen, 'Nuclear Weapons Are Back Again', *Atlantisch Perspectief*, no. 1, 2018.

provided the Soviet Union did the same, was consistent with an ongoing shift from nuclear battlefield weapons to systems with a longer range. The army's nuclear tasks would probably be relinquished before 1995, and in due course the battalion of Lance missiles would almost certainly be withdrawn from service. The White Paper pointed out that as yet there existed no alternative to nuclear depth bombs. The nuclear task of the F-16 would also be maintained, because it was 'the only Dutch weapon system that meets the criterion of a "weapon of last resort"'. In a large-scale conflict, such weapons form the link between the conventional defence in Europe and the United States' strategic nuclear weapons'.²³ On 17 September 1991, in the explanatory memorandum accompanying the 1992 defence budget, the government announced that – for financial reasons and in the light of recent developments – the Netherlands' nuclear artillery tasks would be discontinued earlier, resulting in the discontinuation of the relevant units: the 8-inch howitzers in 1992 and the Lance missile system in 1993. The underlying assumption was that consultations within the Alliance would make this timetable possible.

On 27 September 1991, in response to the situation in the Soviet Union following the failed coup of August that year, President Bush announced a unilateral reduction in US strategic and sub-strategic nuclear weapons. This implied that the United States had decided to support the global elimination of short-range nuclear forces (SNF) and the removal of sea-launched nuclear weapons from warships and bases used by maritime patrol aircraft. In a letter to parliament of 6 October 1991, the Minister of Foreign Affairs and the Minister of Defence welcomed the United States' unilateral steps, which would give rise to similar Soviet-Russian measures. Regarding the Netherlands' nuclear tasks, the ministers concluded that the nuclear task of the F-16 would be maintained but that the nuclear tasks of the artillery, the Lance missile system and the Orion maritime patrol aircraft would almost certainly be discontinued.

On 18 October 1991, the NPG welcomed the US president's decision and highlighted the importance of maintaining the smallest possible number of nuclear weapons – exclusively for dual-capable aircraft – in Europe. It asked SACEUR to work out the details of a new arsenal of 600-800 nuclear weapons. This would reduce the number of nuclear weapons in Europe by 80%, relative to the number of 4,600 agreed in Montebello in 1983. On 22 October 1991, SACEUR announced that the operational tasks of the nuclear artillery and the Lance missile system would be terminated immediately. On 10 February 1992, SACLANT made a similar announcement regarding the nuclear task of depth bombs. On 2 July 1992, the White House announced that all 1,700 SNF weapons and 500 sea-launched nuclear weapons had been removed from Europe. At the NATO summit meeting in Rome on 7-8 November 1991, a new strategic concept was approved, to replace the one laid down in Document MC 14/3. The new strategic concept officially recognised the new situation pertaining to nuclear forces, which warranted a smaller role for nuclear weapons in the Alliance's defence. On the other hand, the political role of nuclear weapons remained undiminished: 'to preserve peace and prevent coercion and any kind of war'. The residual nuclear task of dual-capable aircraft in Europe helped preserve the coupling with the United States' strategic nuclear forces, thus reinforcing transatlantic ties. The strategic concept further stated that, if the nuclear task were to require reinforcement in the future, an obvious option would be to deploy nuclear

23 Defence White Paper 1991, 'Restructuring and Reduction', 9 March 1991, House of Representatives, 1990-1991, Parliamentary Paper 21 991, no. 3.

weapons on offshore (maritime) systems.²⁴ It is in this context that the F-16 fighters continued to perform a nuclear task within NATO. The emphasis was no longer on preserving a high level of readiness but rather on maintaining the skills of the pilots and ground staff to ensure that they could efficiently perform all aspects of this vital task in a wide range of circumstances.

Reducing strategic nuclear weapons

Following the conclusion of the INF Treaty on 8 December 1987 and the CFE Treaty on 19 November 1990, President Bush and President Gorbachev proved willing to conclude an agreement on the comprehensive reduction of strategic nuclear weapon systems. In the Strategic Arms Reduction Treaty (START), which was signed in Moscow on 31 July 1991, they agreed to reduce strategic nuclear weapons by approximately 80% after the end of the Cold War. START I, as it later became known, limited both parties to deploying 6,000 strategic nuclear warheads on no more than 1,600 delivery vehicles (bombers, intercontinental missiles and submarine-launched missiles). START I entered into force on 5 December 1994 for a period of 15 years.

Although President Bush and Russian President Boris Yeltsin signed a follow-up agreement (START II) aimed in particular at reducing the number of multiple nuclear warheads – also known as multiple independently targetable re-entry vehicles (MIRVs) – the treaty ultimately did not enter into force. The US Congress ratified START II in 1996. Russia followed suit in 2000 but withdrew from the treaty in 2002 after Bush withdrew the United States from the 1972 Anti-Ballistic Missile Treaty (ABM Treaty). The United States and Russia signed the Strategic Offensive Reductions Treaty (SORT) in Moscow in 2002. The treaty, which limited each country's nuclear arsenal to 1,700-2,200 operational warheads, was in force from June 2003 until February 2011.

Both parties continued to negotiate further drastic reductions in strategic nuclear weapons. On 8 April 2010, US President Barack Obama and Russian President Dmitry Medvedev signed a new Treaty on Measures for the Further Reduction and Limitation of Strategic Offensive Arms (also known as New START) in Prague. Under this treaty, which entered into force on 5 February 2011 for a period of 10 years, both parties were required to limit their strategic nuclear arsenals to 1,550 warheads and 800 delivery vehicles (of which no more than 700 could be deployed) by February 2018. As far as is known, both parties are complying with these limits. On 1 September 2017, the US government reported that it had 1,393 deployed nuclear warheads on 660 deployed delivery vehicles and a maximum of 800 delivery vehicles.²⁵ Russia, which is currently implementing a modernisation programme, is estimated to possess 527 deployed delivery vehicles and 1,444 nuclear warheads in this category.²⁶

24 The Alliance's New Strategic Concept, 8 November 1991, point 56: '[The Allies] will maintain adequate sub-strategic forces based in Europe which will provide an essential link with strategic nuclear forces, reinforcing the trans-Atlantic link. These will consist solely of dual capable aircraft which could, if necessary, be supplemented by offshore systems. Sub-strategic nuclear weapons will, however, not be deployed in normal circumstances on surface vessels and attack submarines. There is no requirement for nuclear artillery or ground-launched short-range nuclear missiles and they will be eliminated.' See: <https://www.nato.int/cps/ua/natohq/official_texts_23847.htm>.

25 See: <<https://www.armscontrol.org/factsheets/USStratNukeForceNewSTART>>.

26 See: <<https://www.armscontrol.org/factsheets/Russian-Strategic-Nuclear-Forces-Under-New-START>>.

Reducing other nuclear weapons

Since the elimination of their INF weapons, the United States and Russia have concluded no further binding agreements concerning other (sub-strategic) nuclear weapons. Nevertheless, shortly after the end of the Cold War, Bush, Gorbachev and Yeltsin all announced unilateral measures that significantly reduced their countries' sub-strategic nuclear arsenals. Both sides have remained relatively tight-lipped regarding this category of weapons, making it harder to determine accurate numbers – unlike in the case of strategic nuclear weapons.

Unilateral reductions of the US arsenal. By 1991, the number of US sub-strategic nuclear weapons in Europe had already been reduced from 4,600 – the number agreed in Montebello in 1983 – to approximately 2,500. That same year, the United States also withdrew its nuclear weapons from South Korea. On 27 September 1991, President Bush announced a drastic unilateral reduction of US sub-strategic nuclear weapons around the world, including:

- the elimination of all land-based nuclear weapons: artillery shells, short-range missiles and atomic demolition munitions (ADMs);
- the withdrawal of sea-launched nuclear weapons from surface vessels, attack submarines and bases used by maritime patrol aircraft;
- the reduction of the number of nuclear weapons for NATO-assigned fighter aircraft in Europe to approximately 500.

The majority of the nuclear weapons thus removed were dismantled. Only the B61 gravity bombs deployed outside Europe and approximately 260 nuclear warheads for the navy's nuclear-capable Tomahawk cruise missiles (TLAM/N) were transferred to central storage facilities in the United States. The 1994 Nuclear Posture Review (NPR) confirmed the discontinuation of the nuclear tasks of the aircraft carriers and other surface vessels. The TLAM/N warheads were retained in storage for deployment on attack submarines in crisis situations (especially in the Pacific).²⁷

In 2004, President Bush halved the number of sub-strategic nuclear weapons without issuing any kind of official announcement. As a result, the number of aircraft bombs stored in Europe was reduced to approximately 180 by 2009,²⁸ and they disappeared entirely from US air force bases in the United Kingdom. The number of aircraft bombs stored in other European NATO member countries was halved. The more than 300 aircraft bombs that were withdrawn from Europe were transferred to central storage facilities in the United States for the purpose of arming squadrons of F-15 and F-16 fighter aircraft for deployment in crisis situations.²⁹

The NPR published in April 2010 under President Obama terminated the nuclear task of the sea-launched cruise missiles (TLAM/N), whose aging warheads, which dated from 1980, would be gradually dismantled. The 2010 NPR also announced that the F-35 would take over the nuclear task of the F-16 and that a programme to modernise both the strategic and

27 Hans M. Kristensen, *Non-Strategic Nuclear Weapons*, Federation of American Scientists, Special Report no. 3, May 2012, p. 12.

28 This figure is mentioned in a telegram, published via Wikileaks, from the US ambassador to NATO, Ivo Daalder of September 2009, reporting on a briefing by James Miller, Principal Under Secretary of Defense for Policy in the Obama administration.

29 Kristensen, op. cit., p. 12.

tactical versions of the B61 gravity bomb would be carried out.³⁰

Unilateral reductions of the Soviet-Russian arsenal. The withdrawal of nuclear weapons from the former Warsaw Pact countries to Russia was completed in mid-1991. Following the collapse of the Soviet Union in December 1991, Russia also withdrew all 3,500 nuclear weapons, including 2,000 aircraft bombs, from Ukraine. This completed the transfer of the former Soviet Union's nuclear arsenal to Russia.³¹

Estimates of the number of Soviet-Russian sub-strategic nuclear warheads in 1991 range from 15,000 to 21,700 warheads for a wide variety of weapon systems.³² Immediately after the reductions announced by Bush, Gorbachev presented a series of similar unilateral steps on 5 October 1991, including:

- elimination of all nuclear warheads for sub-strategic missiles, artillery shells and mines;
- withdrawal of nuclear weapons from surface vessels, non-strategic submarines and naval aircraft, including elimination of some of these weapons;
- removal of nuclear warheads from air defence missiles, including elimination of some of these warheads.

In addition, Gorbachev offered to eliminate all sea-launched tactical nuclear weapons and place all nuclear warheads for use in gravity bombs and air-launched missiles designed to be dropped by tactical fighter aircraft in central storage facilities, on the condition that the United States (and thus NATO) would do the same.

A few months later, on 29 January 1992, following the collapse of the Soviet Union, President Yeltsin reinforced the measures announced by Gorbachev:

- production of nuclear warheads for sub-strategic missiles, artillery shells and mines, which were due to be eliminated, had already been terminated;
- one-third of the nuclear weapons due to be withdrawn from surface vessels, non-strategic submarines and naval aircraft would be eliminated;
- half of the nuclear warheads due to be removed from air defence missiles would be eliminated;
- in addition to the above, Yeltsin announced that half of the stockpile of nuclear bombs for use by Russia's tactical air forces would be eliminated.

Like his predecessor, President Yeltsin proposed to withdraw all air-launched tactical nuclear weapons and place them in central storage facilities, on the condition that the United States would do the same. Russia thereby continued the Soviet Union's practice, which started in the 1950s, of making bilateral agreements on sub-strategic nuclear weapons dependent on the unilateral withdrawal of all US sub-strategic nuclear weapons from Europe.³³ Because the West continued after the Cold War to reject this condition for follow-up negotiations, Russia

30 2010 *Nuclear Posture Review Report*, April 2010, pp. 27-28.

31 Jonah E. Kaplan and Richard S. Soll, eds., *Walking the Walk: Controlling Arms in the 1990s; Summary of the Fifth Annual International Conference on Controlling Arms, 3-6 June 1996*, p. 32.

32 Kristensen, op. cit. p. 51.

33 See David S. Yost, 'Russia's Non-strategic Nuclear Forces', *International Affairs* 77, July 2001, pp. 531-551.

prioritised the implementation of unilateral reductions and the reduction of strategic nuclear weapons in the framework of START.

While the United States gradually reduced its nuclear presence in Europe to a minimum (see above), the extent to which Russia was really giving up its sub-strategic nuclear weapons remained unclear, due in part to a lack of verification mechanisms. Statements by high-ranking Russian officials cast doubt on Russia's commitment to implementing the declarations of Gorbachev and Yeltsin on unilateral reductions.³⁴

In the run-up to the 2005 review conference of the Non-Proliferation Treaty (NPT), it became clear that Russia had dismantled 30% of its sea-launched sub-strategic nuclear weapons and 50% of its air-launched nuclear bombs and nuclear warheads for air defence missiles. The dismantling of nuclear warheads for land-based weapon systems (short-range missiles, artillery shells and mines) was being delayed by a lack of financial and technical resources. At the NPT review conference, Deputy Minister of Foreign Affairs Sergey Kislyak eventually announced that Russia had reduced its arsenal of sub-strategic nuclear weapons by three-quarters relative to 1991. Five years later, Russia announced the same reduction again.³⁵ The reduction was made possible by the substantial technical and financial support provided by the United States.³⁶ Based on 1991 estimates (see above), it was believed that Russia still possessed between 3,750 and 5,425 sub-strategic nuclear weapons in 2010. In 2011, James Miller stated before Congress that the Obama administration was of the opinion that Russia's nuclear arsenal comprised between 2,000 and 4,000 sub-strategic nuclear weapons.³⁷

In the meantime, Russia has continued to reduce its sub-strategic nuclear weapons. It appears to have completed the dismantling of 50% of its air-launched weapon systems and 30% of its sea-launched weapon systems, while the dismantling of 60% of its air defence systems has exceeded Yeltsin's pledge. However, the dismantling of all land-based weapon systems has not been completed, as nuclear warheads apparently still exist for ballistic missiles with a range of less than 500 km, i.e. the aging SS-21 (Tochka) and its successor the SS-26 (Iskandr-M). In 2017, the *Bulletin of Atomic Scientists* estimated that Russia's sub-strategic nuclear arsenal comprised approximately 1,850 weapons, thought to be broken down as follows:

- 750 sea-launched weapons (cruise missiles and anti-aircraft and anti-ship missiles, depth bombs and torpedoes);
- 560 bombs and missiles to be launched by approximately 350 tactical bombers (Tu-22M3, Su-24M and Su-35) that are capable of striking targets in Europe;
- 400 nuclear warheads for air defence missiles for use against aircraft and ballistic missiles;

34 Simon Saradzhyan, 'Russia's Non-strategic Nuclear Weapons in Their Current Configuration and Posture: A Strategic Asset or Liability?', Belfer Center for Science and International Affairs, Harvard Kennedy School, January 2010, pp. 5-6.

35 Kristensen, op. cit., p. 51.

36 Eugene Rumer, 'Russia Is Winning – Or Is It?', *Moscow Times*, 30 July 2018.

37 Kristensen, op. cit., p. 52.

- 140 mobile ballistic missiles with a maximum range of 500 km (SS-21 and SS-26).³⁸

Proliferation of weapons of mass destruction as a new threat

Attention shifted from the deterrence and containment of opponents to the dismantling and withdrawal of superfluous weapon systems. There was momentum towards elevating non-proliferation and nuclear disarmament to the status of an international norm, which culminated in the permanent extension of the NPT in 1995. This development was also inspired by power-political considerations: new instruments were needed to rein in nuclear proliferation now that the old model of two power blocs led by the dominant nuclear powers no longer applied. Following the Gulf War in 1991, it emerged that Iraq had been engaged in a secret nuclear weapons programme for several years and that it was close to developing a nuclear weapon of its own. During the Iran-Iraq War, Iraqi dictator Saddam Hussein had shown that he was not afraid to use chemical weapons. In the 1990s, Pakistan and India proved determined to attain the status of nuclear powers. The two countries refused to accede to the NPT and conducted initial nuclear weapons tests in 1998. Countries such as North Korea and Iran were found to be developing advanced missile technology. In an increasingly interconnected world, transnational proliferation networks had managed to evade the supervision of states and international organisations such as the International Atomic Energy Agency (IAEA). As a result, countries such as Pakistan were able to realise their nuclear ambitions.³⁹

It was feared that not just states but also international criminal networks and terrorist organisations would gain access to weapons of mass destruction and advanced missile technology and the knowledge to manufacture such systems. In 1998, a commission of inquiry chaired by then-Senator Donald Rumsfeld concluded that the attempts of hostile countries to develop missile programmes posed a growing threat to the United States. Within five years of deciding to manufacture ballistic missiles, such countries could pose a concrete threat.⁴⁰ A month after the publication of the commission's report, North Korea test-launched a Taepo-Dong missile over Japanese territory. This was regarded as confirmation that non-friendly states such as North Korea were seeking to acquire long-range and intercontinental missiles. On 6 January 1999, the United States adopted the National Missile Defense Act, placing strategic missile defence back on the political agenda a decade after the disappearance of the Soviet threat.⁴¹

Now that the need to keep the Soviet Union in check by means of nuclear deterrence no longer existed, it was becoming less clear what role nuclear deterrence still played in the light of the growing threat posed by weapons of mass destruction held by high-risk countries with links to terrorist organisations and by the proliferation of those weapons. Following the terrorist attacks on the United States on 11 September 2001, the administration of

38 Hans M. Kristensen and Robert S. Norris, 'Russian Nuclear Forces, 2017', *Bulletin of Atomic Scientists* 73, no. 2, 2017, p. 116.

39 See: <<https://www.nytimes.com/2004/02/12/world/a-tale-of-nuclear-proliferation-how-pakistani-built-his-network.html>>.

40 *Report of the Commission to Assess the Ballistic Missile Threat to the United States*, 15 July 1998. See: <<https://fas.org/irp/threat/bm-threat.htm>>.

41 See also AIV advisory report no. 28: 'An analysis of the US missile defence plans: pros and cons of striving for invulnerability', 17 July 2002.

President George W. Bush concluded that that strategic concepts such as containment and mutual assured destruction would likely be ineffective against terrorists and rogue states that cared little about protecting their civilian populations (e.g. Iraq, Iran and North Korea). Whereas during the Cold War weapons of mass destruction were regarded as weapons of last resort, the greatest concern now was that opponents would actually use them as weapons of choice. Instead of adopting a reactive stance, it was vital to take pre-emptive action against emerging threats. The United States could use its conventional military superiority as well as diplomacy for this purpose, but ultimately no option would be ruled out to prevent opponents from being able to use weapons of mass destruction against the United States or its Allies.⁴² The events of 11 September 2001 also prompted additional investment in the further development of strategic missile defence, as well as the United States' withdrawal from of the ABM Treaty on 13 December 2001, which came into effect on 13 June 2002.

⁴² *The National Security Strategy of the United States of America*, September 2002.

Advisory Opinion of the International Court of Justice

On 15 December 1994, the UN General Assembly decided to ask the International Court of Justice, one of the main organs of the United Nations (see Article 7 of the UN Charter), to issue an advisory opinion on the following question: 'Is the threat or use of nuclear weapons in any circumstance permitted under international law?' The Court was able to arrive at an advisory opinion only with great difficulty.⁴³ Although it was unanimous in its essentially inevitable finding that the threat or use of nuclear weapons should comply with the requirements of international law, particularly those laid down in the Charter, its answer to the question whether any further restrictions applied gave rise to a split decision, with seven judges in favour and seven judges against. It was ultimately adopted because the President exercised his casting vote. In its considerations, the Court took five steps to reach its findings. It is important to examine those steps when interpreting the Court's advisory opinion.

First of all, the Court considered the unique characteristics of nuclear weapons, from which proponents of a general prohibition inferred that the use of such weapons violated the prohibition against genocide (laid down in the Convention on the Prevention and Punishment of the Crime of Genocide of 9 December 1948) and various international legal norms relating to the safeguarding and protection of the environment. Although these aspects were relevant, they did not lead to a general conclusion. Nevertheless, they would have to be taken into account when assessing whether the threat or use of nuclear weapons was compatible with international law governing the use of force.

The second step in the Court's considerations related to the general rules governing the use of force in international relations. The Court did not automatically rule out the use of nuclear weapons in cases of individual or collective self-defence as provided for by the Charter, as long as it complied with the requirements of necessity and proportionality. However, this did not preclude the possibility that the use of nuclear weapons should be rejected on other treaty-based grounds.

In the third step of its reasoning, the Court therefore discussed various international treaties that have a bearing on the threat or use of nuclear weapons. First, the Court examined the possibility that nuclear weapons should be regarded as poisoned weapons of the kind prohibited at international level in 1899, 1907 and 1925. However, because these prohibitions had never been interpreted as also applying to nuclear weapons, the Court rejected this possibility. It pointed out that certain weapons of mass destruction had instead been prohibited by means of specific instruments, such as those focusing on the development, production and stockpiling of bacteriological weapons (Convention of 10 April 1972) and chemical weapons (Convention of 13 January 1993). As regards nuclear weapons, the Court then went on to list the various treaties limiting the acquisition, manufacture and possession of nuclear weapons; the testing of nuclear weapons; and the deployment of nuclear weapons, which established several nuclear-weapon-free zones (e.g. Antarctica and Latin America). The most important of these instruments is the Treaty on the Non-Proliferation of Nuclear Weapons of 1 July 1968, which was extended indefinitely in 1995.

43 Legality of the Threat or Use of Nuclear Weapons, Advisory Opinion, 8 July 1996, *ICJ Reports* 1996. The text in this annexe is based on an article by Professor E.M.H. Hirsch Ballin ('Nucleaire wapens in het internationale recht: Advies van het Internationaal Gerechtshof van 8 juli 1996 over de rechtmatigheid van de dreiging met of het gebruik van nucleaire wapens', *Ars Aequi*, vol. 47, no. 9, pp. 630-639).

The fourth step in the Court's reasoning concerned the possibility that the threat or use of nuclear weapons was prohibited by a rule of customary international law. One argument in favour of this could be derived from the UN General Assembly's repeated statements to this effect in a series of resolutions, starting with Resolution 1653 (XVI) of 24 November 1961. However, this argument is negated by the fact that these resolutions were rejected by a significant minority. On this basis, the Court could merely conclude that there existed a growing conviction that nuclear weapons should not be used. However, support for the argument that nuclear weapons were rendered lawful by their war-preventing effect remained so strong that it was too early to assume the existence of a prohibition under customary international law.

This brings us to the final, critical step in the Court's reasoning, namely the relationship between nuclear weapons and the principles and rules of international humanitarian law. In this context, the Court also devoted a short passage to the requirement to respect the neutrality of states in case of war, as enshrined in the Fifth Hague Convention of 1907.

International humanitarian law opposes the unnecessary suffering of combatants as well as the involvement of civilians in warfare. Nuclear weapons are obviously problematic on both counts, while the transboundary effects of their use also threatens neutral states. In its considerations, the Court recognised that these rules and principles restricted the permissibility of using nuclear weapons. Although various treaties, including those concerning the position of neutral states, lack a specific reference to nuclear weapons, the Court rejected the view

86. that the established principles and rules of humanitarian law applicable in armed conflict did not apply to nuclear weapons. Such a conclusion would be incompatible with the intrinsically humanitarian character of the legal principles in question which permeates the entire law of armed conflict and applies to all forms of warfare and to all kinds of weapons, those of the past, those of the present and those of the future.

89. The Court finds that as in the case of the principles of humanitarian law applicable in armed conflict, international law leaves no doubt that the principle of neutrality, whatever its content, which is of a fundamental character similar to that of the humanitarian principles and rules, is applicable (subject to the relevant provisions of the United Nations Charter), to all international armed conflict, whatever type of weapons might be used.

Having taken these steps, the Court adopted its findings. Judging by the outcome of the votes, as well as the text itself, this was not a simple task. In particular, the right of self-defence, if necessary and proportionate, was found to be problematic in terms of international humanitarian law and the principle of neutrality. The United Kingdom and the United States, which like many other states made use of the opportunity to be heard by the Court, argued that it was possible to use nuclear weapons in such a way, for example on the high seas or in sparsely populated areas, that they would almost exclusively strike military targets. The Court was not convinced by this view but also felt unable to refute it:

94. The Court would observe that none of the States advocating the legality of the use of nuclear weapons under certain circumstances, including the 'clean' use of smaller, low yield, tactical nuclear weapons, has indicated what, supposing such limited use were feasible, would be the precise circumstances justifying such use; nor whether such limited use would not tend to escalate into the all-out use of high yield nuclear weapons. This being so, the Court does not consider that it has a sufficient basis for a determination on the validity of this view.

At the same time, however, the Court was unable to find sufficient grounds for rejecting the use of nuclear weapons out of hand, as expressed in the following considerations towards the end of its advisory opinion:

95. Nor can the Court make a determination on the validity of the view that the recourse to nuclear weapons would be illegal in any circumstance owing to their inherent and total incompatibility with the law applicable in armed conflict. Certainly, as the Court has already indicated, the principles and rules of law applicable in armed conflict – at the heart of which is the overriding consideration of humanity – make the conduct of armed hostilities subject to a number of strict requirements. Thus, methods and means of warfare, which would preclude any distinction between civilian and military targets, or which would result in unnecessary suffering to combatants, are prohibited. In view of the unique characteristics of nuclear weapons, to which the Court has referred above, the use of such weapons in fact seems scarcely reconcilable with respect for such requirements. Nevertheless, the Court considers that it does not have sufficient elements to enable it to conclude with certainty that the use of nuclear weapons would necessarily be at variance with the principles and rules of law applicable in armed conflict in any circumstance.

96. Furthermore, the Court cannot lose sight of the fundamental right of every State to survival, and thus its right to resort to self-defence, in accordance with Article 51 of the Charter, when its survival is at stake.

Nor can it ignore the practice referred to as ‘policy of deterrence’, to which an appreciable section of the international community adhered for many years. The Court also notes the reservations which certain nuclear-weapon States have appended to the undertakings they have given, notably under the Protocols to the Treaties of Tlatelolco and Rarotonga, and also under the declarations made by them in connection with the extension of the Treaty on the Non-Proliferation of Nuclear Weapons, not to resort to such weapons.

97. Accordingly, in view of the present state of international law viewed as a whole, as examined above by the Court, and of the elements of fact at its disposal, the Court is led to observe that it cannot reach a definitive conclusion as to the legality or illegality of the use of nuclear weapons by a State in an extreme circumstance of self-defence, in which its very survival would be at stake.

An awareness of this lack of resolution is perhaps what prompted the Court to supplement its concrete assessment of the legality of the threat or use of nuclear weapons with a number of considerations that handed responsibility for finding a satisfactory answer to this question back to the international community. According to the Court, the international community had an obligation to pursue negotiations leading to nuclear disarmament in all its aspects under strict and effective international control.

98. Given the eminently difficult issues that arise in applying the law on the use of force and above all the law applicable in armed conflict to nuclear weapons, the Court considers that it now needs to examine one further aspect of the question before it, seen in a broader context.

In the long run, international law, and with it the stability of the international order which it is intended to govern, are bound to suffer from the continuing difference of views with regard to the legal status of weapons as deadly as nuclear weapons. It is consequently important to put an end to this state of affairs: the long-promised complete nuclear disarmament appears to be the most appropriate means of achieving that result.

99. In these circumstances, the Court appreciates the full importance of the recognition by Article VI of the Treaty on the Non-Proliferation of Nuclear Weapons of an obligation to negotiate in good faith a nuclear disarmament. This provision is worded as follows:

'Each of the Parties to the Treaty undertakes to pursue negotiations in good faith on effective measures relating to cessation of the nuclear arms race at an early date and to nuclear disarmament, and on a treaty on general and complete disarmament under strict and effective international control.'

The legal import of that obligation goes beyond that of a mere obligation of conduct; the obligation involved here is an obligation to achieve a precise result – nuclear disarmament in all its aspects – by adopting a particular course of conduct, namely, the pursuit of negotiations on the matter in good faith.

100. This twofold obligation to pursue and to conclude negotiations formally concerns the 182 States parties to the Treaty on the Non-Proliferation of Nuclear Weapons, or, in other words, the vast majority of the international community.

Virtually the whole of this community appears moreover to have been involved when resolutions of the United Nations General Assembly concerning nuclear disarmament have repeatedly been unanimously adopted. Indeed, any realistic search for general and complete disarmament, especially nuclear disarmament, necessitates the cooperation of all States.

For these reasons, the Court decided as follows:

A. Unanimously,

There is in neither customary nor conventional international law any specific authorization of the threat or use of nuclear weapons;

B. By eleven votes to three,

There is in neither customary nor conventional international law any comprehensive and universal prohibition of the threat or use of nuclear weapons as such;

C. Unanimously,

A threat or use of force by means of nuclear weapons that is contrary to Article 2, paragraph 4, of the United Nations Charter and that fails to meet all the requirements of Article 51, is unlawful;

D. Unanimously,

A threat or use of nuclear weapons should also be compatible with the requirements of the international law applicable in armed conflict, particularly those of the principles and rules of international humanitarian law, as well as with specific obligations under treaties and other undertakings which expressly deal with nuclear weapons;

E. By seven votes to seven, by the President's casting vote,

It follows from the above-mentioned requirements that the threat or use of nuclear weapons

would generally be contrary to the rules of international law applicable in armed conflict, and in particular the principles and rules of humanitarian law;

However, in view of the current state of international law, and of the elements of fact at its disposal, the Court cannot conclude definitively whether the threat or use of nuclear weapons would be lawful or unlawful in an extreme circumstance of self-defence, in which the very survival of a State would be at stake.

Summary

The International Court of Justice was unanimous in its opinion that a threat or use of force by means of nuclear weapons that was contrary to Article 2, paragraph 4, of the UN Charter and that failed to meet all the requirements of Article 51 ('the inherent right of individual or collective self-defence if an armed attack occurs') was unlawful.

The Court was also unanimous in its opinion that a threat or use of nuclear weapons should be compatible with international law applicable in armed conflict, particularly the principles and rules of international humanitarian law, as well as with specific treaty obligations concerning nuclear weapons.

As a consequence, the Court was of the opinion that the threat or use of nuclear weapons would generally be contrary to the rules of international law applicable in armed conflict and in particular the principles and rules of humanitarian law. However, in view of the state of international law and of the elements of fact at its disposal, the Court was unable to conclude definitively whether the threat or use of nuclear weapons would be lawful or unlawful in an extreme circumstance of self-defence, in which the very survival of a state would be at stake. Finally, the Court unanimously placed an obligation on the international community to pursue negotiations leading to universal and verifiable nuclear disarmament.

Modernisation of strategic triads

Russia

- Russia is estimated to possess 318 intercontinental ballistic missiles (ICBMs). It is replacing its outdated SS-19 and SS-25 ICBMs with two versions of the new SS-27 missile: the SS-27 Mod 1, which carries a single nuclear warhead, and the SS-27 Mod 2, which can carry up to four nuclear warheads (MIRV). Both versions of the SS-27 come in two formats: one that can be launched from missile silos and one that can be launched from mobile launch platforms that are difficult to trace. The SS-18 ICBM will be replaced by the SS-X-29 or Sarmat (RS-28), which is currently still under development. Like the SS-18, this 'heavy' ICBM will probably be capable of carrying up to 10 nuclear warheads (MIRV), and is designed to penetrate advanced missile defence systems. It is possible that the silos that will house the SS-X-29 will be equipped with their own missile defence systems.
- Over the next few years, Russia will replace its Delta III- and IV-class nuclear-powered ballistic missile submarines (SSBNs) with improved Borei-class SSBNs, of which there are already three in service. Delivery of the remaining five has been delayed. All Borei-class submarines will be equipped with 16 SS-N-32 Bulava ballistic missiles, which are each capable of carrying up to six nuclear warheads. In the 2020s, the eight Borei-class SSBNs (955/955-A) may be supplemented by an additional four in order to arrive at the same number of SSBNs operated by the United States.
- The programme provides for the modernisation of the current fleet of 60-70 long-range bombers (Tu-160 Blackjack and Tu-95MS Bear H), for example through the introduction of a new air-launched nuclear cruise missile, the Kh-102 (AS-23B). Russia also plans to introduce a new version of the Tu-160, the Tu-160M2, after 2023 (chiefly to replace the Tu-95MS). In addition, a new generation of bombers, the PAK-DA, is supposed to enter into service from the mid-2020s, but it is doubtful whether Russia's aviation industry will be able to deliver both new aircraft more or less simultaneously. The plan is for Russia's strategic air forces to eventually have 50-60 of these aircraft.

China

- China possesses 50-70 ICBM launch installations and an estimated 100 ICBMs, some of which are capable of reaching the United States.⁴⁴ It is likely that China has equipped some of its silo-based ICBMs with multiple nuclear warheads with a view to penetrating advanced missile defence systems. China's outdated liquid-fuelled ICBMs are being replaced with more robust solid-fuelled missiles. These missiles, which are compatible with stationary and mobile launch systems, are MIRV-capable (DF-31A, DF-41).
- As of 2015, China possesses four domestically developed Jin-class (Type 094) SSBNs, a number that could eventually rise to five. Each one of these submarines is equipped with 12 JL-2 ballistic missiles, a modified version of the DF-31 ballistic missile with a range of more than 7,000km. It is unclear whether the submarines are already capable of conducting strategic deterrence patrols on a regular basis. In order to attack the US mainland, however, they would have to travel far beyond the relative safety of their

⁴⁴ Estimates can vary depending on whether the focus is just on the contiguous United States or whether Alaska, Hawaii, Guam, American Samoa and smaller Pacific islands are also taken into consideration.

territorial waters. China is expected to develop a more capable third-generation SSBN (Type 096) over the next decade.

- The Chinese air force does not formally have a nuclear task, but several of its outdated H-6 long-range bombers are assumed to be nuclear-capable, as they were previously used for nuclear weapons tests. In 2012, the air force was given various strategic deterrence tasks, such as practising long-range attacks using conventional cruise missiles launched by H-6K bombers.⁴⁵ According to analysts, China may still possess several dozen nuclear gravity bombs dating from the Cold War. In 2016, Chinese military officials announced that the country was developing a new long-range strategic bomber, which will be introduced from the mid-2020s.

United States

- In the framework of a lifecycle-extension programme, the United States has refurbished 400 Minuteman III ICBMs so that they can remain in service until 2030. These silo-based missiles are equipped with a single nuclear warhead or a payload comprising three nuclear warheads. A new generation of ground-based ICBMs is to enter into service from 2029 onwards. They will have the same two types of warheads, but will probably have a longer range and improved targeting capability. In the meantime, the nuclear command-and-control system for the ICBMs is being modernised, including faster, more secure faster communication systems.
- The United States plans to replace its current 14 Ohio-class SSBNs with 12 new Columbia-class SSBNs from the end of the 2020s. The Columbia class will be 2,000 tonnes heavier than the Ohio class and will be equipped with 16 launch tubes, instead of the current 20, for Trident II ballistic missiles, which have already been modernised. These missiles can each carry up to eight nuclear warheads, which are available in two versions (100kt and 455kt). According to the NPR, a small number of the 100kt warheads will be converted into low-yield warheads.
- From the mid-2020s, the United States will introduce a new generation of nuclear bombers, known as B-21s, to supplement and gradually replace part of its current strategic air fleet of B-52H and B-2 nuclear-capable long-range bombers. The current fleet will be equipped with more robust nuclear systems and communication networks. In addition, the United States is developing a new nuclear Long-Range Standoff (LRSO) cruise missile for use by all three aircraft types, which will replace the current air-launched cruise missiles from the 1980s, which are only compatible with the B-52H. The warheads of the outdated cruise missiles will form the basis of the nuclear payloads of the new cruise missiles. The LRSO cruise missiles will be able to penetrate advanced integrated missile-defence systems and will have a much longer range than the B-61 gravity bombs, which can also be launched by the B-2.

45 US-China Economic and Security Review Commission, 'China's Expanding Ability to Conduct Conventional Missile Strikes on Guam', 10 May 2016.

European nuclear deterrence

The debate on the need for an independent European nuclear deterrent was started in the German media towards the end of 2016, but it was only later picked up by the media in other European countries and the United States. It was prompted by several statements made by Donald Trump during his US presidential campaign in which he questioned the United States' nuclear guarantee to its European NATO Allies. Roderich Kiesewetter, a member of the German Bundestag for the CDU/CSU, initiated a discussion on the need for a 'Eurodeterrent' as a thought experiment.⁴⁶ If it ever came to a point where the United States removed its nuclear umbrella, Europe would need to have a Plan B at its disposal. One of the scenarios mentioned was a French-British nuclear guarantee to protect the European member states of the EU and NATO.⁴⁷ In November 2016, an editorial in the *Frankfurter Allgemeine Zeitung* went a step further by stating that, if the worst came to the worst, Germany would have to arm itself with nuclear weapons.⁴⁸ Although the newspaper noted that an independent European nuclear deterrence policy was unrealistic and unfeasible, at the same time it provoked a debate on the need to prepare for a time when Europe could no longer rely on the United States' nuclear guarantee.

In Germany, the debate continued. In 2017, a parliamentary inquiry in the Bundestag, led by Kiesewetter, examined whether German participation in France's nuclear deterrence policy would be legal. The inquiry concluded that, rather than violating the Non-Proliferation Treaty (NPT) or the Treaty on the Final Settlement with Respect to Germany (also known as the Two Plus Four Agreement), such participation would constitute an acceptable continuation of the nuclear-sharing policy already pursued by Germany within NATO.⁴⁹ Moreover, the inquiry concluded that, under Article 42(7) of the Treaty on European Union, the United Kingdom and France were already obliged to provide mutual military assistance, including by nuclear means, in the event of an armed attack on the territory of an EU member state. Given that neither country had attached a reservation to the treaty, nuclear capabilities were not excluded from the member states' obligation to provide assistance 'by all the means in their power'. The inquiry did not consider whether these arguments, which focused mainly on the legal aspects of the issue, would also serve as an adequate political and military deterrent against potential adversaries.

Although Germany and France have conducted informal talks on extending France's nuclear deterrence policy to the Allies on various occasions during and after the Cold War, no

46 Martin Zagatta, 'Wir werden mehr Geld für unsere Sicherheit ausgeben müssen', Deutschlandfunk, 18 November 2016, <http://www.deutschlandfunk.de/eu-verteidigungspolitik-nach-der-us-wahl-wir-werden-mehr.694.de.html?dram:article_id=371737>.

47 'Fearing U.S. Withdrawal, Europe Considers Its Own Nuclear Deterrent', *New York Times*, 6 March 2017.

48 Berthold Kohler, 'Das ganz und gar Udenkbare,' *Frankfurter Allgemeine Zeitung*, 27 November 2016, <<http://www.faz.net/aktuell/politik/inland/nach-donald-trump-sieg-deutschland-muss-aussenpolitik-aendern-14547858.html>>. For an overview of the debate in Germany from November 2016 to present, see: <<https://carnegieendowment.org/2018/08/15/tracking-german-nuclear-debate-pub-72884>>.

49 Wissenschaftliche Dienste, Deutscher Bundestag, *Völkerrechtliche Verpflichtungen Deutschlands beim Umgang mit Kernwaffen. Deutsche und europäische Ko-Finanzierung ausländischer Nuklearwaffenpotentiale*, 2017, <<https://www.bundestag.de/blob/513080/c9a903735d5ea334181c2f946d2cf8a2/wd-2-013-17-pdf-data.pdf>>.

concrete plans have ever been formulated.⁵⁰ France has stated that it is willing to discuss the development of a European nuclear doctrine, but Germany, which would have to bear some of the associated costs, has thus far refused to accept France's offer. A majority of the German population is strongly opposed to nuclear weapons, and this could provide Washington with a political reason to water down the United States' commitment to Europe. These arguments remain valid, but the fact that the debate on a 'Eurodeterrant' has flared up again in recent years – and that there even appears to be scope to discuss an independent German nuclear capability – shows how much uncertainty exists concerning the future of the transatlantic relationship.⁵¹

French and British nuclear deterrence

In the meantime, nuclear cooperation between the United Kingdom and France has intensified. In 2010, the two countries concluded a 50-year bilateral agreement on this sensitive issue,⁵² as part of the Lancaster House Treaties, in which they agreed to jointly invest in nuclear weapon research facilities. New test locations are being established in the Atomic Weapons Research Establishment at Aldermaston and the Valduc Centre of the Commissariat à l'énergie atomique et aux énergies alternatives in Bourgogne. Over the next 50 years, the Valduc Centre will test the safety and viability of French and British nuclear warheads. In addition, the two countries have launched a study on the joint development of several technical components for the next generation of nuclear submarines.⁵³ Since 1992, moreover, they have held regular consultations in the framework of a joint 'Nuclear Commission'.

Because the two countries have different views on the degree to which their nuclear deterrence policy should be autonomous, cooperation remains limited. The United Kingdom has four operationally independent submarines equipped with submarine-launched ballistic missiles (SLBMs) but relies heavily on its cooperation with United States in matters concerning the missiles. It is participating in the upgrade of the US Trident II D5 missile and operates a shared missile pool with the United States. In addition, the United Kingdom is jointly developing a missile compartment with the US for the successor of its Vanguard-class submarine, the Dreadnought. France feels very strongly about its independence. It has kept its nuclear arsenal outside NATO and attaches great importance to its nuclear autonomy, which it maintains through four operationally autonomous submarines equipped with SLBMs carrying French-made nuclear warheads. In addition, it has 54 medium-range nuclear-capable ASMP-A

50 Catherine McArdle Kelleher, *Germany and the Politics of Nuclear Weapons*, Columbia University Press, 1975, Germany goes Nuclear: 1957-1960, pp. 60-89; See also Burkard Schmitt, 'L'Europe et la Dissuasion Nucléaire', ISS Occasional Papers no. 3, October 1997; and <<http://www.spiegel.de/international/europe/thanks-but-no-thanks-sarko-s-uke-offer-bombs-with-berlin-a-506124.html>>.

51 Christian Hacke's opinion piece in *Welt am Sonntag*, 29 July 2018, <<https://www.welt.de/politik/deutschland/plus180136274/Eine-Nuklearmacht-Deutschland-staerkt-die-Sicherheit-des-Westens.html>>; and Wolfgang Ischinger's response: <<https://www.securityconference.de/news/article/ein-atomares-deutschland-waere-verhaengnisvoll/>>.

52 Treaty Between the United Kingdom of Great Britain and Northern Ireland and the French Republic Relating to Joint Radiographic/Hydrodynamics Facilities, 2 November 2010.

53 Benoît Gomis, 'Franco-British Defence and Security Treaties: Entente While it Lasts?', Chatham House, March 2011, p. 6, <http://www.chathamhouse.org/sites/default/files/public/Research/International%20Security/0311pp_gomis.pdf>.

(*air-sol moyenne portée – amélioré*) cruise missiles that are assigned to two squadrons of fighter-bombers.⁵⁴ All these systems are manufactured in France.

Is a Eurodeterrent feasible and credible?

The 2016 Global Strategy for the EU's Foreign and Security Policy discusses the EU's need to achieve 'strategic autonomy'. In the early years of the Common Security and Defence Policy, this ambition focused on operational autonomy (e.g. the 'capacity for autonomous action' mentioned in the St Malo Declaration signed by UK Prime Minister Tony Blair and French President Jacques Chirac in 1998), but in recent years it has focused on industrial autonomy. Initiatives such as the European Commission's European Defence Fund support initiatives like the development of an innovative and competitive European defence industry. With a view to increasing its freedom of action, Europe's operational, political and industrial autonomy could also extend to a nuclear deterrence policy.⁵⁵ Although the EU's Global Strategy does not specifically address the nuclear dimension of strategic autonomy, the EU member states have been so unclear about the precise definition of strategic autonomy that it could well include such a dimension.

It is politically sensitive to think about Europe's nuclear options in the unlikely event that the United States' nuclear guarantee were to disappear. However, it would be politically and strategically naïve to refrain from doing so altogether, regardless of who is in the White House.⁵⁶ Legally speaking, there are no major objections to supplementing – or if necessary replacing – a US nuclear-sharing doctrine with one guaranteed by France and, possibly, the United Kingdom. It does not appear to violate the NPT, and both countries have already provided a guarantee in Article 42(7) of the Treaty on European Union and Article 5 of the North Atlantic Treaty. Although the combined nuclear arsenals of France and the United Kingdom are much smaller than that of the United States, deterrence is not just about numbers but also about credibility. Unlike the United States, France and the United Kingdom would be just as vulnerable as their European Allies in the event of a nuclear attack, due to their geographical location in Europe. An autonomous European nuclear deterrence policy might therefore enjoy greater credibility, but only if both countries improve the effectiveness, deployability and reliability of their nuclear weapons, including against Russia's newest Anti-Access and Area Denial (A2/AD) networks. This might mean that European countries will have to agree to contribute financially to the high cost of maintaining the French and British nuclear arsenals. However, a credible European deterrence policy requires more than a nuclear component. If Europe is to become more independent militarily, it first and foremost needs a robust conventional capability and a firm industrial and economic base, as well as an ability to take concerted political action in times of crisis. In this last area, too, Europe still has a long way to go.

From a political, military and strategic perspective, it is important to ensure that the transatlantic security relationship remains strong and that the United States' nuclear security guarantee remains credible. Given the uncertainties of the future – in particular regarding

54 See: <<http://www.reachingcriticalwill.org/images/documents/Publications/modernization/assuring-destruction-forever-2018.pdf>>, p. 9.

55 See Margriet Drent, 'European Strategic Autonomy – Going it Alone?', Clingendael Policy Brief, August 2018, <<https://www.clingendael.org/publication/european-strategic-autonomy-going-it-alone>>.

56 Aleksandra Marksteiner, 'Alternative Futures: Rethinking the European Nuclear Posture', Atlantic Council, 18 July 2017, <<http://www.atlanticcouncil.org/blogs/new-atlanticist/alternative-futures-rethinking-the-european-nuclear-posture>>.

Europe's relationship with the United States – it also makes sense to examine what options are available to increase Europe's nuclear autonomy. This is Europe's dilemma in a nutshell: how to safeguard the transatlantic relationship while simultaneously contemplating the need for a credible Eurodeterrent.

Terms and abbreviations

Terms and definitions

Anti-Access / Area Denial (A2/AD): the capability or strategy of denying an adversary access to a disputed area and limiting its room for manoeuvre in areas where the opponent has a military presence or military superiority. A2/AD capabilities may serve a defensive objective, but they can also support offensive operations.

Ballistic missile: a projectile, propelled by a rocket engine, that, after the correct speed and precision have been achieved (and the propulsion has been switched off), follows a ballistic trajectory to the designated target. The missile consists of a propulsion section, a guidance section and a warhead (or payload), which can be armed with a conventional or other (nuclear, chemical or biological) charge and a detonator. Ballistic missiles can be fired from a fixed location on land or by a mobile launch system (on board a vehicle, aircraft, ship or submarine). Not to be confused with a cruise missile (see below).

Counterforce: strategic nuclear weapons aimed at military targets such as launch systems, storage facilities and means of delivery for nuclear weapons, command centres and military logistic infrastructure.

Countervalue: strategic nuclear weapons aimed at civilian targets, particularly cities and industry.

Cruise missile: a projectile that is propelled by an engine throughout its entire flight and that uses its own navigation and guidance system to fly to the designated target following a flight plan (at much lower altitude than ballistic missiles).

De-alerting: measures intended to reduce the readiness of nuclear weapon systems, to lengthen the time required for their use and minimise the risk of accidents and unintentional or unauthorised use. This includes physically separating nuclear warheads from the rest of the weapon system and applying stricter verification requirements in decision-making or launch procedures.

De-targeting: a specific measure intended to reduce the readiness of nuclear weapon systems (see 'de-alerting'), whereby nuclear weapons are not programmed with target data in peacetime, or are aimed at areas where they will cause the minimum amount of damage in the event of their unintentional use (for instance the open sea).

Deterrence: influencing the strategic behaviour of an adversary by discouraging undesirable actions. A great deal of attention was focused on this subject in academic and political circles in the West during the first decades of the Cold War. In the relations between nuclear-weapons states, deterrence mainly relates to discouraging armed aggression, on the assumption that decision-making on both sides is rational and controlled. The adversary's decision-makers must be convinced that an armed attack will be unsuccessful and that escalation carries fatal risks. A credible nuclear or conventional response and retaliation capability will make military confrontation an unattractive option and lead to restraint. Deterring escalation may go hand in hand with action that encourages de-escalation (withdrawal, negotiations), for instance presenting an ultimatum or rewarding desired behaviour.

Dual capable: weapon systems that are configured for both nuclear and conventional use. This can refer to the explosive charge of ballistic and cruise missiles, but also to combat

aircraft that perform a nuclear task in addition to conventional missions (Dual Capable Aircraft; DCA).

Escalation dominance: a term used in deterrence theory to describe the aim of nuclear powers to achieve superiority at all levels of military use of force, in case a confrontation with an adversary becomes inevitable (i.e. if the deterrence 'fails'). Although such a conflict is unpredictable and there is reason to doubt the extent to which it can be controlled, a wide range of conventional and nuclear capabilities can also contribute to the credibility of the deterrence. After all, it is in both sides' interests not to have to make use of their nuclear arsenals (which would have devastating consequences for all parties involved) and instead settle a conflict at a lower level ('restoration' of the deterrence).

Extended deterrence: the United States' nuclear arsenal serves to deter aggression not only against the country itself (central deterrence), but also against its allies and partners (extended deterrence). Nuclear security guarantees may serve to strengthen bonds with allies and partners, reassure them and help prevent proliferation. The downside of this transatlantic 'coupling' is that a regional conflict with a strategic opponent could lead to a nuclear or conventional retaliatory attack on US territory, a prospect which may lead to restraint on the part of the US and according to critics render the extended deterrence less credible than the central deterrence.

First-strike capability: the ability to destroy all the strategic weapons of an adversary in a first strike so that it cannot carry out a counterattack that would lead to unacceptable losses on one's own side (also: 'disarming attack').

Gravity bomb: a bomb that is dropped by an aircraft and that, from an initial altitude and having gained an initial speed, follows a trajectory to its target mainly under the influence of gravity. Manoeuvrable tail fins can increase its precision.

Horizontal proliferation: increase in the number of states that have nuclear weapons. This also increases the risk of non-state actors acquiring nuclear knowledge and nuclear material with which a nuclear detonation or radiological contamination could be caused.

Launch-on-warning: a high state of readiness of nuclear forces whereby the time needed between identifying a hostile attack and retaliating with nuclear weapons is reduced to a minimum.

Mutual Assured Destruction (MAD): doctrine based on the assumption that the prospect of mutual destruction will have a restraining and possibly war-preventing effect in a situation involving two equally matched strategic rivals that both have a guaranteed nuclear retaliation capability. A balance of terror based on nuclear retaliation.

Non-nuclear-weapons states: countries that according to the NPT are formally not nuclear-weapons states.

Nuclear sharing: a concept within NATO's nuclear deterrence policy whereby NATO member countries that do not possess nuclear weapons are involved in NATO's nuclear weapons policy.

Nuclear parity: quantitative and/or qualitative balance of weapon systems between parties, whereby all parties feel safe. In absolute terms: numerically equal quantities of nuclear weapons and means of delivery. In relative terms: equal capabilities.

Nuclear weapon: a weapon that derives its destructive power from the release of energy (shock wave, heat, radiation) as the result of a nuclear reaction (the splitting or fusing of atomic nuclei – nuclear fission and fusion). Weapons that involve nuclear fission are also referred to as atom bombs; weapons that involve full or partial nuclear fusion are also referred to as thermonuclear bombs or hydrogen bombs.

Nuclear-weapons states: the nuclear-weapons states formally recognised in the Non-Proliferation Treaty (1970): the United States, the Soviet Union (now the Russian Federation), the United Kingdom, France and China. In a broader sense, nine countries currently have nuclear weapons.

Second-strike capability: the ability of a nuclear-weapons state to withstand an attack by another nuclear-weapons state and to retaliate with a destructive counterattack (nuclear retaliation capability). This implies that part of the state's nuclear capabilities must be able to withstand a first strike and that a counterattack will not be intercepted by missile defence systems. Measures to increase the credibility of retaliation capabilities involve having a range of strategic offensive and defensive options and robust protection of detection, decision-making and launch systems.

Strategic nuclear weapon: a nuclear weapon designed to eliminate strategic targets deep in an adversary's territory (counterforce and countervalue) in order to strike at the adversary's warfare capabilities.

Strategic triad: a three-part strategic deterrence capability consisting of:

- ground-launched nuclear intercontinental ballistic missiles (stored in protective silos);
- submarine-launched nuclear ballistic missiles;
- strategic bomber aircraft that can deliver nuclear bombs and/or launch nuclear (cruise) missiles.

The aim of this three-part configuration is to make it impossible for an adversary to destroy the entire arsenal of strategic weapons in a first strike. The threat of guaranteed retaliation (second-strike capability) thus remains credible.

Sub-strategic nuclear weapons: besides the strategic offensive nuclear weapons referred to in the arms control treaties (strategic nuclear weapons) there is a varied category of other nuclear weapons referred to as 'tactical' or, more often nowadays, 'sub-strategic' or 'non-strategic'.

Theatre Nuclear Forces: In the 1970s the term Theatre Nuclear Forces (TNF) gained currency within NATO, referring to nuclear weapons deployed with a view to a possible conflict between 'East' and 'West' in the European 'theatre'. These weapons' further designations were based on their range (long-range, intermediate-range and short-range/'battlefield' TNF). Defensive systems, such as atomic demolition munitions (ADMs) and ballistic missile defence systems were also considered to be Theatre Nuclear Forces. After the Cold War ended, the idea of a European nuclear theatre became obsolete, and unilateral decisions were made to reduce and dismantle the related categories of weapons. With that, the related terms fell into disuse.

Transatlantic coupling: during the Cold War, the United States guaranteed the security of its European allies by committing to using its nuclear arsenal in exceptional cases if that were the only way to stop an overwhelming attack by the Soviet Union (see 'extended deterrence'). At the same time, the resulting vulnerability (to a retaliatory attack by the Soviet Union on US cities) would, from Europe's perspective, urge the United States to show restraint and not allow tensions in the European theatre to escalate into nuclear conflict.

Vertical proliferation: innovation and stockpiling of generations of nuclear weapons and their means of delivery.

Yield value: the destructive power of a nuclear weapon or warhead, usually expressed as a TNT equivalent (in kilotons or megatons).

Abbreviations

A2/AD	Anti-Access / Area Denial
ABM	Anti-Ballistic Missile
ADM	Atomic Demolition Munitions
AIV	Advisory Council on International Affairs
ALCM	Air-Launched Cruise Missile
ASAT	Anti-satellite
BMD	Ballistic Missile Defence
C3I	Command, Control, Communications and Information
CAVV	Advisory Committee on Issues of Public International Law
CFE	Conventional Armed Forces in Europe
CPGS	Conventional Prompt Global Strike
CSBM	Confidence- and Security-building Measures
CSIS	Center for Strategic and International Studies
CVV	Peace and Security Committee
DCA	Dual Capable Aircraft
DDPR	Deterrence and Defence Posture Review
ERRB	Enhanced Radiation Reduced Blast
EU	European Union
GLCM	Ground-Launched Cruise Missile
IAEA	International Atomic Energy Agency
ICAN	International Campaign to Abolish Nuclear Weapons
ICBM	Intercontinental Ballistic Missile
ICJ	International Court of Justice
IHL	International Humanitarian Law
IKV	Inter-Church Peace Council
ILC	International Law Commission
INF	Intermediate-Range Nuclear Forces
JCPOA	Joint Comprehensive Plan of Action
kt	Kiloton
LEP	Life Extension Programme
LRSO	Long Range Stand-Off (missile)
MAD	Mutual Assured Destruction
MIRV	Multiple Independently-targetable Re-entry Vehicle
MLF	Multilateral Force
MOP	Massive Ordnance Penetrator
NATO	North Atlantic Treaty Organization
New START	Treaty on Measures for the Further Reduction and Limitation of Strategic Offensive Arms
NFU	No First Use
NGO	Non-Governmental Organisation
NIVV	Netherlands Institute for Peace Studies
NNWS	Non-nuclear weapon states
NWS	Nuclear weapon states
NPG	Nuclear Planning Group

NPR	Nuclear Posture Review
NPT	Non-Proliferation Treaty
SACEUR	Supreme Allied Commander Europe
SACLANT	Supreme Allied Commander Atlantic
SALT	Strategic Arms Limitation Treaty
SDI	Strategic Defence Initiative
SLBM	Submarine-Launched Ballistic Missiles
SLCM	Sea-Launched Cruise Missile
SNF	Short-range Nuclear Forces
SORT	Strategic Offensive Reductions Treaty
SSBN	nuclear-powered ballistic missile submarine
START	Strategic Arms Reduction Treaty
TLAM/N	Tomahawk Land-Attack Missile/Nuclear
TNF	Theatre Nuclear Forces
TNT	Trinitrotoluene
UN	United Nations
US	United States

List of persons consulted

Joint Delegation of the Kingdom of the Netherlands to NATO:

- Ambassador, M. de Kwaasteniet
- Head of the Permanent Military Representation, Vice Admiral B. Bekkering
- R. in den Bosch
- A. van Wiggen
- Lieutenant Colonel O. Sluiter

French Delegation to NATO

- Deputy Ambassador, E. Mignot

United Kingdom Joint Delegation to NATO

- P. Spoor

U.S. Mission to NATO

- C. Cheshier
- Colonel S. Duvall

NATO

- Director, WMD Arms Control, Disarmament, and Non-Proliferation Centre, W. Alberque
- Nuclear Policy Directorate, I. Stallion
- Nuclear Policy Directorate, A. Zoklits

Dutch Ministry of Foreign Affairs

- Head of the Non-Proliferation, Disarmament and Nuclear Affairs Division, M.J. van Deelen
- R. Slettenhaar
- T. Coppen

Dutch Ministry of Defence

- Director of International Affairs and Operations, C. Jonker
- H.J.A.M. van Oosterhout
- Lieutenant Colonel B.J.J. de Wit
- J.K. Wassen

Nuclear experts:

- Director of the Nuclear Information Project at the Federation of American Scientists, H.M. Kristensen
- Associate, Harvard Kennedy School Belfer Center for Science and International Affairs, E.A.A. Hellendoorn

Dutch Medical Association for Peace Research

- President, P. Buijs
- Professor of General Practice, Professor A. Knottnerus

PAX

- Defence and Security Project Lead, W. Van der Zeijden
- Humanitarian Disarmament Programme Officer, S. van Oostwaard

Pugwash Netherlands

- President, M. Vogelaar
- L. Hogebrink

Netherlands Red Cross

- Legal adviser, international humanitarian law, J.T. Ninck Blok

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