NUCLEAR DETERRENCE AND SECURITY

“So long as any state has nuclear weapons, others will want them; so long as any such weapons remain, it defies credibility that they will not one day be used, by accident or miscalculation or design; and any such use would be catastrophic for our world as we know it.”

Gareth Evans, Yoriko Kawaguchi, ICNND Report

“The supreme guarantee of the security of the Allies is provided by the strategic nuclear forces of the Alliance, particularly those of the United States, the independent strategic nuclear forces of the United Kingdom and France, which have a deterrent role of their own, contribute to the overall deterrence and security of the Allies.”

Active Engagement, Modern Defence, NATO Strategic Concept, November 2010

Probably the biggest barrier to making progress on nuclear disarmament and preventing nuclear proliferation is the continued role of nuclear deterrence in security thinking and doctrines. As long as States believe that nuclear deterrence can protect them from aggression, they will resist or block efforts and initiatives for nuclear disarmament – even if they accept legal obligations or make political commitments otherwise.

Nuclear deterrence terms

**Deterrence**: persuading an enemy not to attack by making the negative consequences of such an attack much greater than any potential benefits.

**Flexible response**: a range of possible nuclear-use scenarios, including the deployment of sub-strategic or tactical weapons for battlefield use or for use as an interim step prior to massive retaliation.

**Minimal deterrence**: the lowest number of nuclear weapons considered necessary to be able to deter an enemy by inflicting unacceptable damage.
Nuclear deterrence policies arose from a range of different circumstances, exist in a variety of types, and have a range of purposes. A basic understanding of these is important in order to be able to determine the current validity of such policies and the political and security developments required to replace nuclear deterrence in all its forms.

For the United States, nuclear weapons were first developed in response to the fear that Hitler might be developing such a weapon and, if successful, could dictate the terms of – and possibly win – the Second World War. US use of nuclear weapons, ostensibly to end WWII, introduced a nuclear-weapon-use doctrine that expanded into a range of nuclear-war fighting plans. Although the most recent Nuclear Posture Review reversed this

**US nuclear force:** purpose and principles

The US defense strategy aims to achieve **four key goals** that guide the development of US forces’ capabilities, development and use: assuring allies and friends of **US steadfastness of purpose** and its capability to fulfil its security commitment; **dissuading adversaries** from undertaking programmes or operations that could threaten US interests or those of our allies and friends; **deterring aggression and coercion** by deploying forward the capacity to swiftly defeat attacks and imposing severe penalties for aggression on an adversary’s military capability and supporting infrastructure; and, **decisively defeating** an adversary if deterrence fails.

**US Doctrine for Joint Nuclear Operations,** March 2005
trend by scaling down the role of nuclear weapons, the US nuclear deterrence doctrine continues to be multifaceted, including the threat or use of nuclear weapons in a range of circumstances involving the threat of attacks against the United States or its allies by nuclear weapons, other weapons of mass destruction or even conventional weapons.

The Soviet Union developed nuclear weapons following the Second World War partly to balance the power of the United States and partly to protect itself from an attack like those that followed the revolution. It tended to follow the United States in each technological development for nuclear weapons and most policy developments, but maintained a no-first-use policy.

The Russian Federation abandoned this policy, but responded to the International Court of Justice 1996 Advisory Opinion by adopting a policy that nuclear weapons could only be used in the extreme circumstance when its very survival was threatened. This policy was abandoned, however, in response to the development of ballistic missile defence systems by the United States and its allies, which the Russian Federation perceived as undermining its nuclear deterrence capability.

The United Kingdom was the third country to develop and test a nuclear weapon. Its programme was rationalized as both fulfilling the need for an independent deterrent against the Soviet Union and maintaining the United Kingdom as a great global power. In 1998, the United Kingdom affirmed that it would only maintain one nuclear weapon system – SLBMs – and that it would lower operational readiness to use such weapons from days or weeks to months.

**UK nuclear doctrine**

“The UK’s nuclear weapons are (...) to deter and prevent nuclear blackmail and acts of aggression against our vital interests that cannot be countered by other means (...)

We deliberately maintain ambiguity about precisely when, how and at what scale we would contemplate use of our nuclear deterrent. We will not simplify the calculations of a potential aggressor by defining more precisely the circumstances in which we might consider the use of our nuclear capabilities. Hence, we will not rule in or out the first use of nuclear weapons.

The UK’s nuclear deterrent supports collective security through NATO for the Euro-Atlantic area. Nuclear deterrence plays an important part in NATO’s overall defensive strategy, and the UK’s nuclear forces make a substantial contribution.”

France developed nuclear weapons – and its nuclear deterrence policy – after WW II in order to ensure that it would not again face the prospect of being invaded and occupied as it was during both world wars. It was also responding to the Suez Crisis and to diplomatic tensions with both the Soviet Union and its western allies, the United States and the United Kingdom.

French statement on nuclear doctrine

“The French doctrine of nuclear deterrence is the key pillar of our security. It constitutes equally an eminent factor of stability for the European continent, for the allies of France and for the international community. Nuclear deterrence has therefore contributed, for several decades, to the essential maintenance of security and peace in the world.”

French Declaration to the International Court of Justice, November 1995

Despite the fundamental and comprehensive transformation of Europe since 1991 that would make any invasion and occupation of France by another European nation seemingly unthinkable and by other nations unfeasible, France maintains that its force de frappe is vital to ensure that it will never again be weak and susceptible to attack. Furthermore, France sees the possession of nuclear weapons by it and other permanent members of the UN Security Council as protecting global peace and security.

China tested its first nuclear-weapon device in 1964. The weapon was developed as a deterrent against both the United States and the Soviet Union. China adopted a “minimal nuclear deterrence” policy that included non-deployment on foreign territories, no first use and support for a nuclear weapons treaty (global treaty to abolish all nuclear weapons).

India tested a nuclear device in 1974, supposedly for “peaceful purposes”, while maintaining a policy against nuclear weapons and condemning nuclear deterrence up until 1998. The policy changed with nuclear-weapon tests and a declaration of nuclear-weapon-possessing status in May 1998. However, India adopted a “minimal nuclear deterrence” policy similar to that of China, including no first use, support for a convention prohibiting use of nuclear weapons and continued support for a nuclear-weapon convention.

“The refusal of the nuclear weapon states to consider the elimination of nuclear weapons (...) continues to be the single biggest threat to international peace and security. It is because of the continuing threat posed to India by the
deployment of nuclear weapons that we have been forced to carry out these tests.” – **Indian Press Statement**, 15 May 1998

In May 1998, **Pakistan** responded to India’s nuclear tests by testing a series of nuclear weapons and declaring itself a nuclear-weapon power. Pakistan’s quest for a nuclear deterrent was motivated principally by fears of domination by India, which has much bigger conventional forces than Pakistan. As such, Pakistan has not been prepared to adopt a no-first-use doctrine.

**The price of nuclear deterrence**

“To those who believe nuclear weapons desirable or inevitable, I would say these devices exact a terrible price even if never used. Accepting nuclear weapons as the ultimate arbiter of conflict condemns the world to live under a dark cloud of perpetual anxiety. Worse, it codifies mankind’s most murderous instincts as an acceptable resort when other options for resolving conflict fail.”

**General Lee Butler**, former Commander of the US Strategic Air Command, US National Press Club, 4 December 1996

**Israel** is believed to have produced nuclear weapons, commencing its nuclear programme in the 1960s in response to a perceived threat to its security – and even its existence – from Arab neighbours and the Islamic Republic of Iran. Israel does not admit it has nuclear weapons, as such admission could provide a rationale for other Middle East countries to also acquire them. Nor, however, does it deny it possesses nuclear weapons, in order to ensure that “enemies” are deterred from attacking in the belief that Israel could respond with such weapons. Israel supports the concept of a Middle East zone free of nuclear weapons and other weapons of mass destruction, but only after comprehensive peace is achieved in the region.

“Give me peace and we will give up the atom (…) If we achieve regional peace, I think we can make the Middle East free from any nuclear threat.” – **Israeli Prime Minister Shimon Peres**, December 1995

**NATO** integrated nuclear weapons into its security doctrine during the Cold War as a deterrent against a Soviet attack with either nuclear or conventional weapons. Three NATO States possess nuclear weapons (France, the United Kingdom and the United States). Five other NATO States (Belgium, Germany, Italy, the Netherlands and Turkey) host US nuclear weapons on their territories, the control of which could be passed
to their militaries during time of war. The other NATO countries are under an extended nuclear deterrence relationship whereby the United States could use nuclear weapons on their behalf.

The United States also provides extended nuclear deterrence for Australia, Japan and the Republic of Korea. In the case of Australia, this is restricted by its membership of the South Pacific Nuclear Weapon Free Zone, under which the nuclear-weapon States agree not to threaten use of or use nuclear weapons against members. Japan has proposed that the United States scale back the role of nuclear weapons to “sole purpose”, thus restricting the threat or use of nuclear weapons by the United States on its behalf to one of deterring or responding to a nuclear attack.

After the break-up of the Soviet Union, the Russian Federation signed the Tashkent Treaty with a number of former Soviet socialist republics (the Central Asian States), providing them with positive security guarantees that included the possibility of extended nuclear deterrence for their defence. Such guarantees have been limited by the adoption of the Central Asia Nuclear-Weapon-Free Zone.

In 2003, the Democratic People’s Republic of Korea withdrew from the NPT and subsequently tested nuclear weapons. It announced that it had taken that measure to prevent an attack against the country, which it believed was threatened by the United States. Its action was prompted by the US military intervention in Iraq, which was brought about by Iraq’s alleged possession of weapons of mass destruction.

“The Iraqi war taught the lesson that ‘nuclear suspicion’, ‘suspected development of weapons of mass destruction’ and suspected ‘sponsorship of terrorism’ touted by the U.S. were all aimed to find a pretext for war and one would fall victim to a war when one meekly responds to the IAEA’s inspection for disarmament. Neither strong international public opinion nor big country’s opposition to war nor the UN charter could prevent the U.S. from launching the Iraqi war. It is a serious lesson the world has drawn from the Iraqi war that a war can be averted and the sovereignty of the country and the security of the nation can be protected only when a country has a physical deterrent force, a strong military deterrent force capable of decisively repelling any attack to be made by any types of sophisticated weapons. The reality indicates that building up a physical deterrent force is urgently required for preventing the outbreak of a nuclear war on the Korean peninsula and ensuring peace and security of the world.” Press Statement by the DPRK, 15 May 2003
The 2009 IPU resolution on nuclear non-proliferation and disarmament calls on “all nuclear-armed States to adopt confidence-building measures, including the de-emphasizing of nuclear weapons in national security doctrines and the removal of all nuclear weapons from high alert status.”

A basic knowledge of nuclear deterrence is necessary in order to advance policy initiatives to reduce and replace reliance on it. However, nuclear deterrence cannot be fully analysed here, nor is it necessary to empower parliamentarians to take action. You don’t have to be an expert biologist to find your way out of a forest. Similarly, focusing too narrowly on nuclear-deterrence theory can limit rather than inspire solutions for achieving a nuclear-weapon-free world in the 21st century. Nuclear deterrence experts are prone to over-examining the reasons for, and politics of, maintaining nuclear deterrence, paying less attention to exploring solutions and political opportunities for changing the nuclear-deterrence/nuclear-proliferation dynamic.

One very useful contribution to the latter concern was made by the ICNND in its report, Eliminating Nuclear Threats: A Practical Agenda for Global Policy Makers, which identified a number of key rationales for nuclear deterrence, examined their validity, and provided possible approaches to reducing and replacing the genuine security roles for nuclear deterrence.102

In essence, the ICNND indicated that some drivers for nuclear deterrence are totally illegitimate. These include:

- the argument that nuclear weapons cannot be “un-invented”, so there is no point trying to eliminate them;
- ascribing status to nuclear-weapons possession;
- the use of nuclear weapons as a tool of power and persuasion; and
- the argument that disarmament is not necessary to advance non-proliferation.

(Others have also identified the financial interest of corporations producing nuclear weapon systems and the nuclear-weapon scientific communities as strong drivers for maintaining nuclear weapon policies.)
The ICNND argued that other drivers or roles ascribed to nuclear deterrence are ill-founded, unproven or can now be met by other means. These include the beliefs that:

- nuclear weapons have deterred, and will continue to be required to deter, war between the major powers;
- nuclear weapons are required to deter any chemical or biological weapons attack;
- nuclear weapons are required to deter terrorist attacks;
- nuclear weapons are required to protect US allies; and
- any major move towards disarmament would be inherently destabilizing.

However, the ICNND argues that there are some genuine security roles for nuclear deterrence and that these must be addressed in order to achieve comprehensive nuclear disarmament. These include the role of nuclear weapons to deter nuclear attack and the possible role of nuclear weapons in countries with inferior conventional forces to deter any large-scale conventional attack.

Parliamentarians, especially in those countries that ascribe to nuclear deterrence, have a responsibility to take up the challenge - and indeed, the legal, moral and security obligation - to achieve nuclear disarmament, by discussing the continued validity of nuclear deterrence and developing policies to rescind or replace it by other security mechanisms. This issue is too important to be left to defence and foreign affairs ministries, which too often are bound up in the status quo.

Such exploration can occur in national parliaments, regional parliamentary organizations such as the NATO Parliamentary Assembly and informal parliamentary groups.

The NATO Parliamentary Assembly, for example, discussed this issue from 2008 to 2010 with a particular focus on the role of nuclear weapons in NATO policy (and the deployment of US non-strategic weapons in Europe). The Sub-Committee on Future Security and Defence Capabilities recommended that continued exploration by parliamentarians from NATO countries was vital, especially on the
question of: “What alternative measures might Member States find acceptable in ensuring their defence should a change to the status quo (i.e. removal of remaining US nuclear weapons from Europe) take place?”

The imperative for parliamentarians to examine the validity of, and alternatives to, nuclear deterrence

“Parliamentarians in many countries pay too much deference to defence officials and are often slow to challenge policies, particularly nuclear policies. Instead they need to push for radical changes to old or outdated policies and secure the support of all politicians and military officials for arms control agreements backed by effective verification measures.”

Lord Des Browne, former UK Defence Secretary, Chair of the European Leadership Network, member of the IPU Committee on UN Affairs, October 2011

Various other groups – including the European Leadership Network, Parliamentarians for Nuclear Non-proliferation and Disarmament, the Inter-Action Council and the Asia Pacific Leadership Network – have also taken up the task of exploring and promoting security mechanisms to replace nuclear deterrence. These include establishment of Nuclear Weapon Free Zones (particularly in the Middle East and North-East Asia), strengthening international institutions such as the UN Security Council and the International Criminal Court, and commencing preparatory work on the framework for a nuclear weapon-free world.

Deterrence versus defence

Policymakers often talk about defence and deterrence as if they were the same. Ward Wilson makes a useful distinction between the two.

“Deterrence is psychological. It is the process of persuading an opponent that the costs of a particular action are too high. It relies on the calculation of your enemy, on his mental acuity and rationality. In this way, deterrence can never work on a person who is insane, or whose ability to calculate has been overwhelmed by emotion. It relies on your opponent’s ability and willingness to calculate the costs before acting and is therefore, to the extent that human calculation is unreliable, an unreliable means of protecting yourself and those you love.”

“Defence, on the other hand, can be thought of as interposing a physical presence between your enemy and those you wish to protect from harm. Defence can be a shield held up to deflect a sword stroke, a bullet proof vest, or a field army interposed between your enemy and your economically fertile valleys and prosperous cities.”

Ward Wilson, Rethinking Nuclear Weapons Project, James Martin Center for Nonproliferation Studies
In December 2009, US Congressmen Ed Markey and Pete Stark sent a letter to President Obama (co-signed by another 24 US legislators) urging the President to use the Nuclear Posture Review process to “make a dramatic break from the nuclear weapons policies of the past” and to “faithfully implement the agenda you have laid before our nation”.103

They encouraged President Obama to take three practical steps relating to the nuclear deterrence doctrine, namely to:

- limit the mission of nuclear-weapons to a sole purpose of deterrence against the threat of nuclear weapons, rescinding other roles relating to other weapons of mass destruction, conventional weapons or unforeseen circumstances;

- end the high-alert status of nuclear weapon systems (their operational readiness to be used within minutes under launch-on-warning policies); and

- pledge that the United States would not use nuclear weapons first in any conflict.

The significance of the first point is that if all nuclear-weapon States moved to a doctrine of sole purpose, then negotiations can start on a treaty to eliminate nuclear weapons under strict and effective international control. The nuclear-weapon States would be able to consider giving up their nuclear arsenals so long as they can be convinced that all other nuclear-weapon possessors would be doing likewise.
The significance of the second and third points is that their implementation would greatly reduce the risks of nuclear-weapon use by accident or miscalculation, and would also reduce the threat posture and reduce tensions between nuclear-armed States.

President Obama responded positively to the calls in the letter by including in the Nuclear Posture Review, released in April 2010, two significant changes to US nuclear policy:

- to make the primary purpose of nuclear weapons to deter nuclear weapons, with a commitment to working towards making this the sole purpose of nuclear weapons; and
- to maximize the presidential decision-making time in a nuclear crisis (a formulation indicating a lowering of operational readiness to use nuclear weapons).

In addition, the Nuclear Posture Review affirmed the practice of non-use of nuclear weapons and called for this practice to be “extended forever”. Recognizing that moving to a nuclear-weapon-free world would require the development of security mechanisms and frameworks to phase out nuclear deterrence, President Obama also included commitments to:

- increase the reliance on non-nuclear elements to strengthen regional security architectures;
- initiate a comprehensive national research and development programme to support continued progress towards a world free of nuclear weapons, including expanded work on verification technologies and the development of transparency measures; and
- engage other States possessing nuclear weapons, over time, in a multilateral effort to limit, reduce and eventually eliminate all nuclear weapons worldwide.

India and the Rajiv Gandhi Action Plan in the 21st century

Reducing the salience of nuclear weapons in security doctrines

In October 2010, at the request of Indian parliamentarian Shri Mani Shankar Aiyar, Prime Minister Manmohan Singh established the Rajiv Gandhi Action Plan Group to examine and revise the nuclear
disarmament proposals submitted by Rajiv Gandhi to the UN General Assembly in 1988 in order to produce an action plan more relevant to current security needs and frameworks.

The Group, chaired by Shri Mani Shankar Aiyar, produced a report in August 2011 that included a number of recommendations on practical measures to reduce the salience of nuclear weapons in the security doctrines of the States possessing such weapons in order to pave the way for a nuclear-weapon-free world. These included that India should:

- initiate bilateral dialogues on nuclear disarmament issues with all other States possessing nuclear weapons;
- promote an agreement by the States possessing nuclear weapons on the non-use of nuclear weapons against non-nuclear States;
- promote a global agreement to prohibit the use and threat of use of nuclear weapons, which would need to include the allies covered by extended nuclear deterrence doctrines as well as the States possessing nuclear weapons; and
- support the commencement of multilateral negotiations on the elimination of nuclear weapons.

For India to successfully implement any of these policies, it would need positive engagement from other States possessing nuclear weapons. As such, Shri Mani Shankar Aiyar and other members of the Rajiv Gandhi Action Plan Group have been promoting the recommendations in key forums in such countries, including through delegation meetings, parliaments, and conferences of Global Zero, PNND and others.

**Recommendations for Parliamentarians**

- Call for the rescinding of launch-on-warning and for taking all remaining nuclear weapon systems off high operational readiness for use.
- Initiate studies and hold hearings on approaches to phasing out nuclear deterrence and achieving security without nuclear weapons.
- Explore additional measures to strengthen the norm of non-use of nuclear weapons with a view to their global elimination.
In November 2010, NATO adopted the new Strategic Concept outlining its future nuclear policy and establishing two new processes to discuss deterrence and arms control. For the first time, NATO committed itself to creating “the conditions for a world without nuclear weapons”\(^{106}\). On the other hand, the Strategic Concept makes it clear that NATO leaders are not prepared to undertake unilateral nuclear disarmament, stating that “as long as there are nuclear weapons in the world, NATO will remain a nuclear Alliance”\(^{107}\).

The NATO Parliamentary Assembly provided input for the discussions leading to the new Strategic Concept through two key working groups, one on US non-strategic nuclear weapons in Europe\(^{108}\) and one on missile defences in NATO\(^{109}\) (both chaired by Raymond Knops of the Netherlands).

The groups raised key questions that need to be addressed in fulfilling NATO’s aims of creating the conditions for a nuclear-weapon-free world. These include:

> Do NATO members – the easternmost Allies and Turkey in particular – continue to see the physical presence of US nuclear weapons as a necessary demonstration of the US deterrent?

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**Examples**

A. **NATO Parliamentary Assembly**
   Challenging the status quo, providing new answers

B. **German Parliament**
   Questions on reducing the role of nuclear weapons in security doctrines

C. **North-East Asia**
   Enhancing non-nuclear security through a nuclear-weapon-free zone
What alternative measures might Member States find acceptable in ensuring their defence should the status quo change?

To what extent should changes in NATO’s nuclear policy be linked to initiatives by the Russian Federation?

What is the relationship between the ongoing development of missile defence systems and the issue of US nuclear weapons in Europe?

The NATO Parliamentary Assembly provides a useful forum for discussing these issues, and thus advancing new approaches to reducing the role of nuclear weapons in NATO doctrine and strengthening non-nuclear security policies and mechanisms. The groups were clear that an enhanced discussion on these issues is necessary – in national parliaments, the NATO Parliamentary Assembly and other forums.

On 28 September 2011, a group of German parliamentarians submitted a series of questions in parliament to the Foreign Minister on further developing German nuclear disarmament policy – strengthening and developing Germany’s role in non-proliferation. These included questions on reducing the role of nuclear weapons in NATO’s strategy, withdrawing US nuclear weapons from Germany and the relationship between missile defence systems and the development of collective and cooperative security. The questioners pointed to the agreements States, including Germany, concluded at the 2010 NPT Review Conference to make progress in these areas.

In answering the questions, the Foreign Minister announced that Germany would enhance its efforts in support of a nuclear-weapon-free world. He noted that the conditions for commencing negotiations on a nuclear weapons convention were not yet fulfilled, but announced a project with the Middle Powers Initiative and PNND “to investigate the conditions for creating a nuclear-weapons-free world”. The Bundestag Subcommittee on Disarmament and Arms Control has focused on this project as a way of enhancing parliamentary and government
consideration of strategies to reduce and eliminate the role of nuclear weapons in security doctrines, including through the examination of non-nuclear approaches to security.

Nuclear deterrence plays a very prominent role in the security doctrines of all north-east Asian countries. Japan and the Republic of Korea rely on extended nuclear deterrence provided by the United States to counter conventional and nuclear threats they perceive from China, the Democratic People’s Republic of Korea and the Russian Federation. The Democratic People’s Republic of Korea withdrew from the NPT in 2003 and embraced nuclear deterrence in response to threats it perceived from supposedly hostile States, in particular the United States. The country has since tested nuclear weapons and indicated that it will not return to the 1992 Agreement on the Denuclearization of the Korean Peninsula or rejoin the NPT unless progress is made towards normalizing relations, such as a peace treaty to formally end the current armistice and additional non-aggression security assurances.

In this context, the proposal for a north-east Asian nuclear-weapon-free zone (see Chapter 6. Nuclear-Weapon-Free Zones, “North-East Asia nuclear-weapon-free zone”, for details of the proposal and parliamentary action) could enhance security and scale back the role of nuclear weapons for all States in the region. Under the proposal put forward by a cross-party group of Japanese and Korean legislators, Japan and the Republic of Korea would agree to forgo nuclear deterrence with respect to the Democratic People’s Republic of Korea (but would remain “protected” by US extended nuclear deterrence in response to the security threats they perceive from China and the Russian Federation). The United States, the Russian Federation and China would agree not to threaten or use nuclear weapons against Japan or either of the two Koreas. In return, the DPRK, having received such security guarantees, would be required (and would most likely therefore be willing) to give up its nuclear-weapon capability.
Formal discussions of the proposal have not been possible due to the inability of the governments to resume the Six-Party Talks. However, parliamentarians from the region have been able to explore, discuss and advance the proposal in a range of forums, including cross-party meetings, parliamentary conferences, delegation visits (to Washington, Pyongyang and Beijing) and side-events at UN and NPT meetings. Such discussions, and the resulting papers and draft treaty, provide fertile ground for diplomats to discuss the proposal once formal talks resume.

**Recommendations for Parliamentarians**

- Ask questions in parliament on what the government is doing to lower the role of nuclear weapons in security doctrines in line with the agreements made at the 2010 NPT Review Conference.
- Initiate studies and hold hearings to examine the validity of nuclear deterrence in current security frameworks, and to consider approaches to phasing out nuclear deterrence and achieving security without nuclear weapons.
- Examine proposals for establishing nuclear-weapon-free zones (e.g. in North-East Asia, the Arctic and Central Europe) as approaches to attaining security guarantees, reducing the role of nuclear weapons and building cooperative security.