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Practical Measures to Reduce the Risks Presented by Non-Strategic Nuclear Weapons

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Practical Measures to Reduce the Risks Presented By Non-Strategic Nuclear Weapons

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The Scope of the Problem

The term "non-strategic" refers to a very broad category of nuclear weapons – effectively all weapons that are not subject to the U.S.-Soviet and U.S.-Russian treaties on strategic offensive weapons (START I, START II, and SORT).[1] Within the US-Russian context, one category of non-strategic weapons – intermediate-range (500 to 5,500 km) land-based missiles can be disregarded as they were eliminated pursuant to the 1987 INF Treaty.

Today, the term "non-strategic weapons" embraces a great variety of delivery systems and warheads – all land-based nuclear-equipped delivery vehicles with the range up to 500 km, all sea-based weapons with the range up to 800 km and all sea-launched cruise missiles regardless of range, and all air-based weapons with the range up to 600 km. Delivery vehicles also vary by type – nuclear mines, howitzers, missiles, gravity bombs, etc. They can carry warheads with a broad variety of yields (from tons to more than a hundred kilotons). All delivery vehicles in the non-strategic category are dual-use

[1] START I – Strategic Arms Reduction Treaty, signed in 1991, entered into force in 1994, reductions completed in 2001, remains in force until 2009; START II – Strategic Arms Reduction Treaty, signed in 1993, ratified by both U.S. Senate (1996) and the Russian Federal Assembly (2000), has never entered into force, in 2002, following abrogation of the 1972 ABM Treaty by the United States, announced null and void by Russia; SORT – Strategic Offensive Reductions Treaty, signed in 2002, entered into force in 2003, will remain in force until 2012. The term "tactical nuclear weapons" often is used interchangeably with that of "non-strategic."

(i.e., they can carry both nuclear and conventional warheads), making inapplicable the traditional SALT-START-INF approach to accounting, in which all delivery vehicles with a certain range are considered equipped with nuclear weapons. The existing classification of non-strategic nuclear weapons by range of delivery vehicles is thus not very precise, but alternative approaches (e.g., based on yield or size) are also inadequate. A principal advantage of using range to define the category of weaponry is its compatibility with other legally-binding arms control agreements.

All non-strategic nuclear weapons, with the above-mentioned exception of intermediate-range land-based missiles, are subject only to non-binding unilateral parallel initiatives (known as Presidential Nuclear Initiatives or PNIs) announced by George Bush and Mikhail Gorbachev in the fall of 1991 (Gorbachev's statement was confirmed and slightly expanded by Boris Yeltsin in January 1992).

The Bush initiatives of September 27, 1991 included the following provisions:

- complete elimination of warheads from land-based missiles and artillery shells;
- withdrawal and dismantling of approximately one-half of all non-strategic nuclear warheads from submarines and surface ships (except SLBM), including nuclear depth bombs for land-based naval aircraft;
- under a separate initiative of October 17, 1991, the United States and Great Britain agreed to reduce its stockpile of nuclear gravity bombs in Europe from 1,400 to 700 (200 of those were removed by Great Britain and the remaining 500 by the United States.

Mikhail Gorbachev responded on October 5. Together with Boris Yeltsin's additions on January 29, 1992, the Soviet/Russian initiative included:

- complete elimination of warheads for tactical land-based missiles, artillery shells, and mines;
- elimination of one half of warheads for anti-ballistic and anti-aircraft missiles; the remaining warheads were to be stored at central facilities;

- elimination of one-third of nuclear warheads for surface ships and submarines except for warheads of SLBMs; a commitment to store remaining warheads at central facilities;
- partial elimination of warheads for naval aircraft; a commitment to store remaining warheads at central facilities;
- elimination of half of warheads for tactical Air Force aircraft.[2]

As a result of these parallel, unilateral initiatives, only a portion of the original arsenal of gravity bombs and short-range missiles for aircraft remains deployed (available for use on short notice) in the United States and Russia. Warheads for all other classes of sub-strategic nuclear-capable delivery vehicles are either eliminated or confined to central storage facilities. It should be noted, however, that in Russia central storage facilities for many naval weapons are located at naval bases and thus nuclear warheads are, in principle, available for deployment on short notice. The term "central" refers, in this instance, to their administrative status rather than location.

The informal regime embraced only warheads while delivery vehicles themselves remained outside its scope. Furthermore, the presidential statements did not include reference to absolute numbers but only indicated a percentage of the weapons to be reduced; absolute numbers still have not been disclosed by either side.

These shortcomings notwithstanding, reductions under the PNIs, including transfer of warheads to storage facilities, amounted to many thousands of nuclear charges and represent the single largest effort at reducing nuclear weapons. The scale of reductions can be gleaned from data provided by the Natural Resources Defense Council in Table One below. (Although the methodology employed by NRDC for calculating

[2] The texts of the statements by George Bush, Mikhail Gorbachev and Boris Yeltsin can be found in SIPRI Yearbook 1992, p. 65-73, 85-92. For an analysis of these accords see William C. Potter, Nikolai Sokov, Harald Muller, and Annette Schaper, *Tactical Nuclear Weapons: Options for Control* (Geneva: United Nations Institute for Disarmament Research, 2000).

numbers is questionable, the table gives a reasonable representation of the depth of reductions.)[3]

TABLE ONE: REDUCTIONS UNDER THE PNIs

	1991	2001
USSR/Russia	**10.918**	**3.380**
USA	**6.100 (including 1.400 in Europe)**	**1.120 (including 150 in Europe)**

According to other sources, Russian non-strategic nuclear weapons were reduced from almost 22,000 to about 3,000 between 1991 and 2001.[4]

Although some of the steps called for by the PNIs were implemented promptly, others have taken place at a much slower pace, especially in Russia. For example, in 1996 the Russian Foreign Ministry announced that elimination of warheads pursuant to PNIs would be completed by the year 2000.[5] The process of elimination, however, had to be extended. One reason was insufficient funding. In addition, according to unofficial reports, in the late 1990s dismantlement of warheads for strategic delivery vehicles was accorded higher priority, and consequently tactical warheads were pushed back in line. Russia's National Report on the Implementation of the NPT at the 2000 NPT Review Conference stated that elimination of artillery shells and nuclear mines was only "nearing

[3] Robert Norris and William Arkin, "NRDC Nuclear Notebook: Russian Nuclear Forces, 2002," *Bulletin of Atomic Scientists*, July/August 2000, p. 70; Robert Norris and William Arkin, "NRDC Nuclear Notebook: U.S. Nuclear Forces, 2002," Bulletin of Atomic Scientists, May/June 2002, p. 71. The main drawback of the methodology used by NRDC is accounting by delivery vehicles. As a result, their figures include, for example, sea-based systems that no longer carry nuclear warheads (although these warheads might still be available at storage facilities), but apparently undercount air-based weapons: more than one complement of warheads might be available for each nuclear-capable aircraft.

[4] See Nikolai Sokov, "The Tactical Nuclear Weapons Controversy," *Jane's Defense Weekly*, January 31, 2001.

[5] Interfax, September 26, 1996.

completion."[6] The report to the 2002 NPT Preparatory Committee added warheads for land-based short-range missiles to the list of "incompletes" and promised that elimination would be completed by 2004, but only "on condition of adequate financing."[7] At the 2004 PrepCom the Russian delegation reported that reductions under PNIs had been "practically implemented" with the exception of non-strategic weapons of ground troops (warheads for tactical land-based missiles, nuclear artillery shells, and nuclear mines) and were being eliminated "subject to technological capabilities of the enterprises of the nuclear weapons complex and available financing."[8]

The United States might have been expected to complete elimination much faster due to incomparably better financial circumstances. In 1998, however, a senior U.S. official, Norman Wulf, reported that while dismantlement in some categories had been completed, artillery shells, warheads for short-range missiles, and nuclear depth bombs would be eliminated by 1999.[9] His statement at the 2002 PrepCom and the "U.S. Information Paper on Article VI" at the same forum did not include specific language,[10] but unofficial sources suggested that artillery shells were still waiting in line due to insufficient dismantlement capacity, although completion of that work had originally

[6] National Report on the Implementation of the Nuclear Nonproliferation Treaty by the Russian Federation, April 25, 2000, document of the Permanent Mission of the Russian Federation to the United Nations No. 37.
[7] Statement of the Delegation of the Russian Federation at the First Session of the Preparatory Committee for the 2005 NPT Review Conference under Article VI of the Treaty, New York, April 11, 2002 (document distributed by the Russian delegation at the PrepCom).
[8] Statement of the Head of the Russian delegation A. Antonov at the 3rd NPT PrepCom, April 28, 2004.
[9] Statement by Norman A. Wulf on April 27, 1998 at the Second Preparatory Committee (PrepCom) meeting for the 2000 Review Conference of the Non-Proliferation Treaty (NPT), at http://www.acronym.org.uk/textonly/dd/dd26/26doc.htm.
[10] Statement of Ambassador Norman A. Wulf on April 8, 2002 at the First Session of the Preparatory Committee for the 2005 NPT Review Conference under Article VI of the Treaty, New York, April 11, 2002 (at http://www.acronym.org.uk/npt/2002us.htm). U.S. Information Paper on Article VI," April 11, 2002 (at http://www.acronym.org.uk/npt/2002us2.htm).

been scheduled for August 2002.[11] Only in March 2003, with the elimination of the last W-79 nuclear artillery shell, did the U.S. complete implementation of its PNI pledge.[12]

The Challenges of Non-Strategic Nuclear Weapons

Security challenges associated with non-strategic nuclear weapons, which necessitate efforts to enhance their security and reduce their numbers, could be grouped, for purposes of discussion, into three categories: properties of these weapons, political uncertainties and the precariousness of arms control regimes, and developments of nuclear strategy that may enhance the perceived political and military utility of nuclear weapons.

1. Properties of Non-Strategic Nuclear Weapons

Many nuclear warheads for non-strategic delivery vehicles (especially warheads for sea- and air-launched missiles, artillery shells, and perhaps some gravity bombs) are small and are thus more vulnerable to theft. Particularly dangerous in this regard are portable atomic demolition munitions, (ADMs), a number of which apparently are still stored in Russia. An unknown number of older nuclear charges for Russian non-strategic delivery vehicles may not be equipped with electronic locks or permissive action links (PALs). These properties would appear to make them especially attractive to terrorists.

Another reason to be concerned about non-strategic nuclear weapons is the pattern of their storage and deployment. The procedures for safeguarding weapons that are intended to be readily available for use (deployed) probably are less stringent than

[11] Walter Pincus, "Powerhouse H-Bomb Heads for Graveyards," Washington Post, August 8, 2002, p. 10.
[12] U.S. Delegation Fact Sheet: Non-Strategic Nuclear Weapons, Third Session of the preparatory Committee for the 2005 Review Conference, May 5, 2004. This fact sheet reports that over 3,000 tactical nuclear weapons have been eliminated by the United States under the PNIs.

those at permanent storage sites. These procedures were designed during the Cold War for prompt release of weapons to troops and may not have changed significantly since. The same applies to some Russian central storage facilities at naval bases.

Finally, vulnerability of storage facilities to a preemptive strike encourages early release of nuclear warheads to troops, aircraft, and naval vessels in a time of a major crisis. Fortunately, the post-Cold War period has not seen crises of such magnitude, but the theoretical possibility should not be dismissed. Obviously, deployment of sub-strategic nuclear weapons could further aggravate the crisis, would be more vulnerable to theft, and the danger of unauthorized use might increase.

2. The future of Arms Control Regimes

Challenges to the PNI-based informal regime stem from two contradictory features. First, since the regime is not legally binding, it can be easily abrogated by either side even without prior notification. The absence of data exchange and verification procedures has produced two unwelcome consequences: uncertainty with respect to the implementation of PNIs and considerable disparity of numbers. Data exchange that was instituted following the creation of the NATO-Russia Council in 1997 remains limited to generally worded reports about the share of warheads stored or dismantled. This shortcoming was evident in January 2001, when Russia was alleged to have transferred nuclear warheads for short-range land-based missiles to the Kaliningrad region. The informal regime did not provide a mechanism to address this suspicion. For its part, the Russian military persistently questions the rationale for the small American non-strategic nuclear arsenal in Europe.

The second weakness of the regime is its rigidity, which stems, paradoxically, from its informal nature. There is simply no way to amend its conditions if need arises. Almost any change in posture, even if it does not give rise to substantive concerns on the other side, could lead to the collapse of the regime.

In spite of these drawbacks, the unilateral approach to arms control has gained popularity in recent years as it provides greater flexibility to parties and does not require formal and often extended negotiations. Their implementation is also cheaper. Notwithstanding these advantages, the stability and very existence of informal regimes depend on the state of political relations. A serious crisis could trigger the deterioration and disavowal of unbinding commitments, leaving non-strategic nuclear weapons uncontrolled.

3. New Trends in American and Russian Nuclear Strategies

The 2000 Military Doctrine in Russia and the 2002 Nuclear Posture Review in the United States marked an attempt to reintroduce nuclear weapons into the array of usable military instruments. The Nuclear Posture Review provides for the possibility of limited use of nuclear weapons against targets associated with weapons of mass destruction in proliferant countries. Development of low-yield (and thus more usable) nuclear weapons is actively discussed both within and outside the government.

Russian strategy concentrates on using nuclear weapons for the purpose of deescalating limited conventional conflicts to deter possible limited conventional attack (or the threat of it) by the United States and China. For example, all key Russian documents, including the so-called “White Paper” of the Russian Ministry of Defense published in the fall of 2003, refer to NATO enlargement and a string of U.S. military

campaigns in the 1990s and the early 2000s as security challenges.[13] Although American programs are mentioned as one of the reasons for increased attention to nuclear weapons,[14] the trend actually precedes the Nuclear Posture Review. Another prominent mission for the Russian nuclear arsenal is deterrence of states in "the South" which have or might acquire weapons of mass destruction (WMD), including, for example, Pakistan, Iran, and, possibly in the future, Iraq.

This orientation influences the Russian stance toward the initiative to create a nuclear-weapons-free zone in Central Asia. Russia only supports a zone that does not take precedence over the Tashkent Treaty on Collective Security, which it interprets as allowing the deployment of nuclear weapons in the region under certain circumstances.[15]

In contrast to the Cold War period, the number of warheads contemplated for use under the new doctrines is limited – apparently, to single digits. Nevertheless, the power of example appears to affect the attitude toward nuclear weapons in many countries. For example, Chinese experts and officials increasingly question their country's no-first-use policy and closely scrutinize Russia's nuclear doctrine to determine whether it might fit Beijing's needs.

New attention in the United States and Russia to the possible utility of nuclear weapons has gradually erased the difference between strategic and non-strategic weapons. Post-Cold War missions are primarily assigned to long-range non-strategic nuclear weapons, as well as some delivery vehicles that are classified in existing treaties as strategic (heavy bombers with air-launched cruise missiles). One cannot even rule out

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[13] "Aktualnye Zadachi Razvitiya Vooruzhennykh Sil RF," available at http://www.rian.ru.
[14] See, for example, a press conference by the Deputy Chief of the General Staff Col.-Gen. Yuri Baluevski on February 11, 2004 (text available at http://www.mil.ru).
[15] For a discussion of this issue, see Scott Parrish, "Prospects for a Central Asian Nuclear-Weapons-Free Zone," *The Nonproliferation Review* (Spring 2001), pp. 141-148.

the possibility that some of the weapons that were denuclearized under the PNIs (for example, sea-launched cruise missiles) might eventually be again equipped with nuclear warheads.

The Impediments to Non-Strategic Nuclear Weapons Reduction and Elimination

Notwithstanding the compelling political, military, and economic arguments in support of efforts to limit, reduce, and eventually eliminate non-strategic nuclear weapons, the main impediment is perceptual: resistance to arms control measures is grounded first and foremost in the belief in the tangible utility of nuclear weapons in general and, in particular, of their non-strategic variety. Proceeding from this belief, as well as from the shared desire to preserve maximum flexibility with regard to the composition and the operations of their nuclear arsenals (displayed most prominently in the highly imprecise nature of SORT), both the United States and Russia object to the efforts of non-nuclear states and NGOs to push non-strategic nuclear to the front of the arms control agenda.

Russian opposition is especially pronounced and categorical, while U.S. perspectives, on occasion, are more nuanced. In the context of the NPT Review Process, for example, Russia is by far the most vocal opponent of all proposals that seek to strengthen the existing voluntary limitations on non-strategic nuclear weapons. At the recently concluded 2004 NPT PrepCom, the head of the Russian delegation denounced the balanced language on non-strategic nuclear weapons proposed by the Chair in his draft Factual Summary. Even stronger demarches by Russian diplomats warning states to desist from raising the issue of non-strategic nuclear weapons were delivered privately to

representatives of some states parties. The more public arguments made reference to the infeasibility of pursuing reductions of non-strategic nuclear weapons separately from those of other kinds of arms and "outside of the context of political situation in the world and in Europe… [as well as] expansion of military-political alliances, etc." More private communications revealed Russian concerns not only about US/NATO superiority in conventional arms, but a fear of both an expanding U.S. military presence in the Caucasus and Central Asia, as well as evolving unfavorable demographics and military force postures vis-à-vis China. Although not directly expressed, Russia's posture toward non-strategic nuclear weapons also may stem from the perception of being "singled out" – a view reinforced by well-intentioned international efforts to enhance the security of the Russian nuclear arsenal.

Since 2002, the United States also has resisted calls by many states in the NPT Review Process to bolster the parallel unilateral declarations. In the NPT forum, Washington has expressed doubts about the ability to verify legally-binding restrictions on non-strategic nuclear weapons. It has been more receptive than Russia in principle, however, to work on enhancing transparency and security of sub-strategic nuclear weapons bilaterally within Working Group One of the Consultative Group on Strategic Security. It also maintains its readiness to discuss means related to information exchanges on nuclear security issues in the context of the NATO-Russia Council. In practice, however, it has not seriously pursued these issues with Russia.

Practical, Incremental Steps for Advancing Arms Control Related to Non-Strategic Nuclear Weapons

There are both general dangers associated with the properties of non-strategic nuclear weapons and specific challenges to the 1991/92 PNIs. A number of practical steps to reinforce the fragile, informal regime are identified below.[16]

1. Reaffirm PNIs

A very high priority should be given to preventing the erosion and collapse of the informal regime. An important but relatively simple step that should be taken is for the United State and the Russian Federation to reaffirm in a joint statement their continued commitment to the 1991/92 parallel, unilateral declarations. Ideally, action of this sort would be taken at a US-Russian presidential summit.

2. Complete Implementation of the 1991/92 PNIs and Provision of Detailed Information on Implementation

Although Russia was not obligated to meet the implementation deadlines it announced, it is clear that from statements of Russian officials that it faces both technical and financial difficulties in dismantlement of non-strategic nuclear weapons. International assistance could help it meet its obligations and perhaps implement additional reductions (see recommendation 8 below). To facilitate such assistance it needs to negotiate, in good faith, conditions for the provision of such assistance, in particular those that relate to accountability.

[16] This section draws upon the ideas articulated in a variety of publications and seminar and working papers. See, in particular, Taina Susiloto, ed., *Tactical Nuclear Weapons, Time for Control* (Geneva: United Nations Institute for Disarmament Research, 2002); Jeffrey A. Larsen and Kurt J. Klingenberger, eds., *Controlling Non-Strategic Nuclear Weapons: Obstacles and Opportunities* (U.S. Air Force Institute for National Security Studies, 2001); Rudiger Ludeking, "Non-Strategic Nuclear Weapons," Paper presented at the Workshop on Non-Proliferation Treaty, Annecy, France (March 7-8, 2004) and "Working Paper on Reduction of Non-Strategic Nuclear Weapons," submitted by Austria, Sweden, and Ukraine to the Preparatory Committee for the 2005 Review Conference of the Parties to the Treaty on the Nonproliferation of Nuclear Weapons (April 29, 2004).

In addition, both Russia and the United States should provide the international community with information about the implementation activities they have conducted under the PNIs, as well as about such additional reductions of non-strategic nuclear weapons as they might agree upon in the future or pursue unilaterally,

3. Increase Transparency.

Greater exchange of information on a voluntary basis related to both sides' arsenals of non-strategic nuclear weapons in multilateral for a (e.g., the NPT Review Process) and bilaterally (involving more sensitive information) can foster greater predictability and reduce misperceptions, such as those which arose in the Kaliningrad controversy. One approach would be to rely upon largely unverifiable voluntary data exchanges, perhaps regarding the number of non-strategic nuclear weapons by category (i.e., deployed, reserve/long-term storage, slated for elimination) and their distribution by region.

4. Enhance Security

Enhanced security for non-strategic nuclear weapons, both in storage and in transport, is essential in order to reduce their attractiveness to terrorists. These measures should equally apply both to weapons that are supposed to be in central storage facilities and to those that are kept available for deployment on short notice. It also would be desirable to concentrate as many remaining non-strategic nuclear weapons as possible at centrally located storage facilities far from military bases and populated regions.

Measures to enhance security of storage and transportation of Russian non-strategic nuclear weapons might require international assistance. American assistance in

enhancing security of storage sites for strategic warheads could be expanded to include storage of warheads for non-strategic delivery vehicles.[17]

5. Reduce the Alert Level

Measures should be implemented to reduce further the operational status of nuclear arms, including non-strategic nuclear weapons. These measures might include an agreement on (1) extending the time required to mate "ready-to-use" warheads with delivery vehicles (perhaps by instituting a new set of procedures for the release of warheads to troops), and (2) advance notifications about the movement of warheads to forward deployment areas or to bases where delivery vehicles capable of carrying these warheads are deployed. A more advanced measure could include installation of remotely controlled sensors that would notify the other side or another designated party, such as IAEA. These sensors can provide assurances that warheads kept at military bases are not mated with delivery vehicles without warning and that warheads kept at central storage facilities are not moved secretly to military bases where they could be mated with delivery vehicles. Forward deployment might be suspected, for example, if a significant number of warheads were to be relocated to storage sites in the same area.

Ideally, a reduction in alert levels also would be accomplished by transferring all warheads to central (and centrally located) storage facilities. That is, warheads for air-based delivery vehicles that under the PNIs are not required to be in central storage would no longer be made available for use on short notice.

[17] In the last two years American assistance was used to enhance physical protection at 30 out of 39 naval facilities and is also expanding to include storage facilities of Strategic Rocket Forces. Perhaps one of the most significant developments in that area is the Russian agreement to grant necessary access of American representatives to the sites that have traditionally been considered the most sensitive. See the Statement of Paul Longsworth, Deputy Administrator for Defense Nuclear Nonproliferation, National Nuclear Security Administration, U.S. Department of Energy, Before the Senate Armed Services Committee, U.S. Senate, March 10, 2004.

6. Codify the 1991/92 PNIs

Due to their voluntary nature, the 1991/92 unilateral declarations can be disavowed at any time. It, therefore, would be desirable to codify the existing declarations into a legally binding treaty. At the initial stage, formalization of the regime only would require conversion of the existing texts of the relevant unilateral statements into legally binding language similar to that in the SORT Treaty. If necessary, the PNIs could be revised slightly to take account of changes in each side's perceived security needs.

7. Adopt Global Ban on Selected Non-Strategic Nuclear Weapons

Although it is likely to prove difficult to negotiate the total elimination of non-strategic weapons, it may be possible to achieve a ban – bilaterally or even globally – on certain specific categories of these weapons, especially those of least interest to the United States and Russia. They might involve atomic demolition munitions (ADMs), nuclear artillery shells, and nuclear warheads for short-range ballistic missiles. A focus on these subsets of non-strategic nuclear weapons might have a beneficial confidence-building effect and also serve to multilaterize what has been largely a bilateral issue.

8. Agree to Further Reductions

The remaining arsenals of U.S. and Russian non-strategic nuclear weapons are excessive, and steps should be taken to reduce them further, preferably in a transparent, verifiable, and irreversible manner beginning, perhaps, with warheads that are confined to central storage under the PNIs. It is also advisable for the United States, as part of this process, declare its intention to return to U.S. territory the small number of air-launched tactical nuclear weapons currently deployed in Europe, which no longer perform a

meaningful military role. Subsequently, an agreement could be sought to ban deployment of nuclear weapons outside national territories.

9. Pursue a Comprehensive Verification Approach.

One should seek a comprehensive verification system that would encompass all nuclear warheads – both strategic and non-strategic. This approach is desirable as it is difficult to distinguish reliably between warheads intended for strategic and non-strategic delivery vehicles. Any partial regime is apt to lead to suspicions and mutual accusations. A verification regime for the number and the status (deployed vs. non-deployed) of warheads could include remote sensors as well as baseline on-site inspections to verify the number of warheads at each storage facility at the beginning of the regime.

Conclusion

One should not underestimate the difficulty of implementing any of the aforementioned proposals. Recent international developments, including the growing danger of high-consequence nuclear terrorism, however, demonstrate the need to take immediate and concerted action on the non-strategic weapons front. To do so will require considerable political courage, creativity, and perseverance.

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