

Obama and Medvedev set new limits on nuclear arsenals; further cuts likely

In Moscow, the two leaders reaffirmed commitments to curb proliferation, but differences remain over the US plan for a missile shield in Europe.

US President Barack Obama and Russian President Dmitry Medvedev apparently did not allow the recently strained relations between the two nations to impede progress on reducing the numbers of nuclear weapons in their arsenals. But the cutbacks that the two leaders agreed to at their meeting last month in Moscow were modest, and many observers expect larger reductions to come, perhaps as soon as next year.

Three days after that agreement, leaders of the Group of Eight summit of major industrialized nations endorsed Obama's proposals for addressing the threat posed by nuclear proliferation and terrorism. The proposals include US ratification of the Comprehensive Test Ban Treaty, the start of negotiations toward a treaty to terminate fissile materials production worldwide, and the strengthening of both the Treaty on the Non-Proliferation of Nuclear Weapons and the authority of the International Atomic Energy Agency. Obama also announced plans to host a global nuclear summit next March that will focus on securing vulnerable nuclear materials; combating nuclear smuggling; and deterring, detecting, and disrupting nuclear terrorism.

In Moscow, Obama and Medvedev agreed to reduce their countries' deployed strategic warheads to between 1500 and 1675. Those numbers are to be formalized in a treaty being negotiated to replace the Strategic Arms Reduction Treaty (START), which expires on 5 December. The new ceiling on warheads is very near the 1700 floor that was set in a 2002 accord between George W. Bush and Vladimir Putin. That treaty capped warheads at 2200 per side. Those limits weren't required until 2012, but the US strategic stockpile has already sunk to the 2200 mark, according to an authoritative analysis by Robert Norris of the Natural Resources Defense Council and Hans Kristensen of the Federation of American Scientists

(see the table). The actual number of US warheads is classified, though officials of the Department of Energy's National Nuclear Security Administration (NNSA) have stated that the US stockpile in 2012 will be one-quarter of what it was at the end of the cold war, and will then be the smallest in more than 50 years.

A leisurely pace?

In contrast to the rapid reduction of the stockpiles in recent years, the agreement signed by Obama and Medvedev wouldn't require the new cuts to be completed until 2017 at the soonest. Specifically, their agreement will enter

Commission on the Strategic Posture of the United States advised in recommendations it delivered in May, says Morton Halperin, one of the commission's 12 members. Lawmakers intended that the commission, chaired by former defense secretary William Perry, guide the development of a new policy, and the latest agreement will "pave the way for much more substantial reductions" once it's completed in December, Halperin says.

A one-day pact

Daryl Kimball, executive director of the Arms Control Association, calls the accord "an interim, stopgap agreement."

Regardless of the numbers, he notes, a follow-on to START is essential to ensure that verification and transparency measures will remain in place when START expires on 5 December. Not only did the Bush-Putin accord include no verification provisions, but it was written so that it comes into effect for only a single day: 31 December 2012. In the absence of a START follow-on, the two nuclear superpowers would become "virtually unregulated" on 1 January 2013, Kimball says.

The Bush-Putin measure also did not place any limits on delivery systems—intercontinental missiles, submarine-launched missiles, and bombs. Obama and Medvedev agreed to reduce those

to between 500 and 1100 apiece, compared with the 1600 allowed under START. Both countries are already closer to the low end of the new target range, says Kristensen, and Russia is expected to have fewer than 500 before long. The US has maintained between 750 and 800. START rules often require the counting of delivery vehicles that have been taken out of service, such as the launch tubes of four Trident submarines that no longer carry nuclear payloads. The rules of the new treaty are under negotiation.

Kimball laments that the US and Russia have yet to limit the numbers of warheads that are kept in reserve, able

US and Russian nuclear weapons 2009

Weapons category	US	Russia
Operational	2 700	4 830
Strategic	2 200	2 780
Tactical	500	2 050
Reserve	2 500	3 500*
Total stockpile	5 200	8 330*
Awaiting dismantlement	4 200	4 670*
Total inventory	9 400	13 000*

*No reliable public estimates are available for the number of warheads in the Russian reserve or total stockpile or that are awaiting dismantlement.

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into force seven years after ratification of a new treaty. "They could implement this in a couple of months," notes Kristensen. "Why fiddle around for seven years?" Such a go-slow approach could rob Obama of the chance for more substantial reductions, he says, even if one assumes that he wins a second term.

The more likely explanation for the delay, Kristensen and others believe, is that the numbers are placeholders inserted in advance of a congressionally mandated review of US nuclear weapons policy that is under way at the Department of Defense and NNSA. An incremental reduction in nuclear forces is "precisely" what the Congressional

to be quickly reactivated. Nor have the two nations agreed to cut their tactical nuclear forces. In an analysis published in the April edition of the *Bulletin of the Atomic Scientists*, Norris and Kristensen estimated that the US stockpile includes about 2500 warheads maintained in reserve and roughly 500 operational tactical weapons. They estimate that another 4200 warheads have been declared surplus and are awaiting dismantlement, the result of a 2004 Bush directive that the stockpile be cut in half by 2012. Bush's order was fulfilled five years ahead of schedule, but dismantlements haven't kept pace; Norris and Kristensen figure that 300 warheads were disassembled in 2008 and that 350 will be taken apart this year. At that rate, they say, the backlog won't be cleared until 2022.

Missile defense put off

Obama and Medvedev did not address Russian opposition to US plans to install antiballistic missile batteries and radar stations in Poland and the Czech Republic. Although the US has insisted that the system is meant to shield NATO members from a missile attack from Iran, Russia views the installations as a threat to the strategic balance in the region. A US policy review of the missile defense system is to be completed by the end of the summer.

The two presidents did agree to strengthen their cooperation in preventing nuclear terrorism and the proliferation of nuclear weapons. Specifically, they promised to increase security at nuclear facilities, minimize the use of highly enriched uranium (HEU) in civilian applications, support effective export controls, and consolidate their stockpiles of nuclear materials in fewer locations. The leaders also reaffirmed commitments to dispose of their massive stockpiles of weapons-grade materials that are deemed surplus, including 34 metric tons each of weapons-grade plutonium.

The leaders reiterated their nations' 2005 commitments to take back the HEU that they exported in decades past to allies around the globe, mainly to fuel research reactors. In May the NNSA announced that it had removed 14.5 kg of HEU from spent fuel in Australia, which completed the recovery of all 100 kg of US HEU in that country. Overall, the US has recovered more than 1215 kg of HEU fuel—enough to make about 48 nuclear weapons—from 27 countries, according to the NNSA. The US has also assisted Russia in its recovery of HEU from former Soviet republics.

David Kramer

Helping to rebuild Croatia

In 1991 six republics of Yugoslavia fell into chaos. Croatia, Bosnia and Herzegovina, Serbia, Montenegro, and later the Serbian province of Kosovo saw massive population displacements and an estimated collective death toll of more than 300 000. Vast swaths of infrastructure were devastated. It was the worst crisis in Europe since World War II.

Central to the rebuilding of science and education in Croatia is Ivo Šlaus. "I was interested in physics at high school," he says, "particularly on the structure of matter." In 1958 at the University of Zagreb, Šlaus earned a PhD in nuclear physics based on research he did while on a UNESCO scholarship at the University of Rochester in New York. That trip, he says, "led to a 40-year association with a number of nuclear and particle physics centers such as UCLA; Duke, Georgetown, and Washington universities; TRIUMF in Vancouver, Canada; the Naval Research Laboratory; and the national labs at Argonne, Brookhaven, and Los Alamos."

Šlaus's other interest is politics. "While physics and science in general have a well-defined domain," he says, "politics permeates everything, particularly with R&D and education." Šlaus was a founder of the European Physical Society. In 1992, when Croatia was recognized as an independent country, Šlaus was appointed the foreign secretary of the Croatian Academy of Sciences and Arts, and promoted Croatia's membership in international scientific organizations such as the International Council for Science. He helped found the All European Academies and the global InterAcademy Panel.

A call to serve

"In 1996, together with a colleague, Ivan Supek, I founded the Croatian Movement for Democracy and Social Justice," says Šlaus. That led in 1998 to his being asked to chair the social democratic parties council in Zagreb and to run in the 2000 parliamentary elections. Between 2000 and 2003, Šlaus was Zagreb's Member of Parliament; he worked on the foreign affairs committee and chaired the subcommittee on science, technology, and higher education. "Having a background in physics helped tremendously," he says. "Physicists think in terms of numbers, and in

politics nearly everything comes down to numbers. Moreover, they have one additional advantage: Physicists think rationally based on axioms, but are always ready to challenge any axiom and do it constantly."

Šlaus says that his main push while in Parliament was to build education and research links with neighboring countries and the European Union. "I tried to introduce several reforms, such

as increasing R&D investment [and] the number of university students and professors, and to get students to complete their degrees in a given time frame. Unfortunately, most of these attempts failed," he says. "Academic institutions can be extremely conservative in their operating structure—as US President Woodrow Wilson said, 'It is easier to move the cemetery than to change any curriculum.'" But, he

adds, "I was successful in helping to establish new universities in Zadar and Dubrovnik."

The hardest part was trying to maintain his physics activities. "There were 15 PhD scientists in the Croatian parliament," he says, "but the number of practicing scientists was very low. . . . Politics is enormously time consuming and intensive." Nevertheless, adds Šlaus, while in Parliament he continued to teach in Croatia and the US two to three months every year, and published 10 scientific papers.

A broader interest

In recent years, Šlaus's political interest has focused more on global issues, particularly on weapons of mass destruction and democratic stability: "I joined Pugwash [an organization of academics and ex-officials that works on reducing WMD] in 1963, but I became really active in 1993 when I became more interested in dealing with the [unstable] political situation in Croatia."

Šlaus is now on the Pugwash council, which has been a mediator in a series of back-channel talks between the US and Iranian governments. "WMDs are not a large concern of the public compared to other issues," he says, "despite the risk of annihilation."

He has been involved in bringing together scientists from NATO and non-NATO countries to work on scientific research and on counterterrorism; Croatia officially became a member of

