

Discussions in scientific nuclear diplomacy

Although I recognize the sincere and meaningful contributions Sig Hecker made to nuclear arms control ("Adventures in scientific nuclear diplomacy," *PHYSICS TODAY*, July 2011, page 31), let's not forget that his recent diplomatic overtures were of the type that US weapon laboratories formidably and systematically opposed during the cold war and were met with considerable controversy, some of which is still relevant to current nuclear policy options.

Hecker's personal contributions are extraordinary, and they reflect a relaxation of the national and international postures that evolved during and immediately after the cold war. Nevertheless, I am reminded of the difficulties and contentiousness created or stimulated by American nuclear weapons laboratories during the cold war decades.

In fact, because of risky US administration policies at the time, nongovernmental organizations (NGOs) and individuals had to counterbalance the militant practices and political supporters of the weapons labs. Public-interest physicists Frank von Hippel, with the Federation of American Scientists, and Tom Cochran, with the Natural Resources Defense Council, particularly, should receive credit for organizing unprecedented meetings with many previously inaccessible Soviet officials and scientists; the meetings largely preceded those involving Hecker. The NGOs had a significant influence on the origins and form of the ensuing Nunn-Lugar legislation, which provided US support to the Soviet Union to dismantle, securely transport, and safeguard against proliferation of nuclear weapons.

As a matter of record, a colleague and I actually preceded Hecker in ear-

lier lab-to-lab visits to the sensitive Russian facilities of Chelyabinsk and Arzamas; we also conferred with such luminaries as Yuri Trutnev, Boris Litvinov, Victor Mikhailov, Vadim Simonenko, and Evgeny Avrorin. In fact, we were told privately that the iconic Tsar Bomba design was rated at a horrendous 150 megatons, three times the nominal test yield.

Many of us who were personally associated with such unofficial diplomacy placed our professional positions, funding, and security clearances at considerable risk because of interference from the US nuclear weapons laboratories and other powerful cold war institutions.

The interests of the US weapons labs were often a major hindrance to cold war progress, and the labs' intransigence and monied influence sometimes led to setbacks from negotiated nuclear-arms stability, both before and immediately after the breakup of the Soviet Union. It might be an understatement to note that the Los Alamos weapons lab was not particularly supportive of alternative initiatives involving the Department of Energy's nonweapons laboratories, other government agencies, or individuals working through outside channels.

It's good to see that those problems have lessened considerably and that personal contacts by scientists, citizens, and all levels of government can help keep a lid on nuclear proliferation and excessive armaments.

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■ **Sig Hecker's article**, "Adventures in scientific nuclear diplomacy," clearly demonstrates that international scientific interactions can enhance US national security. Unfortunately, particularly with regard to Russia, a lack of such interactions may increase the nuclear danger and perhaps even lead to Russia's return to nuclear weapons testing.

As Hecker noted, President Bill Clinton issued Presidential Decision Directive PDD/NSC-47 in 1996 for US scientists to engage their Russian counterparts in activities related to the Comprehensive Nuclear-Test-Ban Treaty (CTBT).¹ That directive should have been a major boost to US-Russia cooperation in the unclassified scientific

underpinnings of stockpile stewardship. However, as Hecker also noted and I reported in detail,² lab-to-lab collaborations subsequently declined to a point where fewer CTBT-related cooperative scientific activities are in place now than were at the time the directive was released.

Past failure to adequately carry out PDD/NSC-47 may now stand as a roadblock to President Obama's intention to "reset" relations with Russia.³ With the Obama administration poised to seek ratification of the CTBT, extensive scientific interactions called for by PDD/NSC-47 and advocated by Hecker may be the best assurance the US can have that Russia will comply with the CTBT. And perhaps more importantly, those interactions may be the best assurance to Russia, and other nations, that the US will comply. Renewing and rebuilding such collaboration and the trust that goes with it will require a determined effort truly championed by the Obama administration.

References

1. Clinton Presidential Decision Directive PDD/NSC-47, issued 21 March 1996; available at <http://www.fas.org/irp/offdocs/pdd/pdd-47.pdf>.
2. I. Lindemuth, *Nonproliferation Rev.* **16**(3), 483 (2009).
3. I. Lindemuth, *Nonproliferation Rev.* **17**(2), 214 (2010).

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■ **The R&D of nuclear weapons** in the US has become a profit-making business, managed at Los Alamos and Lawrence Livermore National Laboratories by a for-profit entity led by Bechtel Corp. So it may seem fitting that nuclear diplomacy also be conducted more by private individuals. Could observations made by such individuals—in North Korea, say, and at that country's behest—inadvertently renew fears of North Korean nuclear aggression and lead to political pressure for more US weapons R&D? In that context, Sig Hecker fails to mention that he was a signatory to a 2010 letter, also signed by nine other former directors of our nuclear weapons labs, criticizing the Obama administration's Nuclear Posture Review for being too restrictive of continuing R&D on nuclear weapons. Is

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Hecker really describing a new form of “scientific nuclear diplomacy,” or is he advocating for more politicization of the already difficult politics of nuclear weapons?

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■ **In the interesting** feature article by Sig Hecker, figure 3 caught my eye. The caption attributes the drawings to an unnamed Russian. I’m certain they are drawings by Jean Effel, French illustrator and caricaturist (and Communist) who was quite popular in the Soviet Union in the 1960s. I have a book of drawings that was published in the Soviet Union in 1963, and while it does not contain the specific drawing presented in the figure, I find the style unmistakable.

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■ **Hecker replies:** Irvin Lindemuth is correct in urging the Obama administration to redouble its efforts to rejuvenate US–Russia lab-to-lab nuclear cooperation. It is tragic that now, more than 15 years after Presidential Decision Directive PDD/NSC-47, we have fewer collaborations despite stockpile challenges after 20 years without nuclear testing and the need for deeper reductions of the nuclear arsenals on both sides.

Alexander DeVolpi rightly points out the essential contributions of US non-government organizations and individuals to nuclear scientific diplomacy with the Soviet Union. In addition to the ones he names, individuals from MIT, Harvard and Stanford Universities, and the National Academy of Sciences Committee on International Security and Arms Control contributed, as did individuals from the Russian Academy of Sciences. Those organizations and individuals prepared the path for the Nunn–Lugar legislation. Early visits to the Russian nuclear weapons institutes by DeVolpi and some of my Los Alamos and Lawrence Livermore colleagues should be similarly commended.

I find it unfortunate that DeVolpi appears to lay much of the blame for the cold war and the difficult post–cold war transition on the weapons labs. I was director at Los Alamos during the transition, and I believe we did a commendable job in meeting our primary responsibility of a safe, secure, and reliable nuclear stockpile while reaching out to our Russian counterparts as soon as we felt the cold war’s thaw. The collaborations allowed scientists such as



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Journal of American Chemical Society, March 2011

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Desktop Engineering, July 2011

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