



ISSUE PAPERS

August 2009

#15: The Nuclear Defense Working Group (NDWG): Final Report

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The Nuclear Defense Working Group (NDWG) was chartered in 2007 as an independent advisory group, via a grant from a private foundation to the non-profit Center for the Study of the Presidency and Congress (CSPC), to advise federal agencies and Congress on the threat of clandestine nuclear attack, including nuclear terrorism, and means for reducing and countering that threat. The NDWG consists of 12 former senior government officials and university and national lab scientists, all with long experience in the policy, programs, and technologies for dealing with this threat

This report summarizes the group's views, as of early 2009, as well as key things we believe should be done by the Obama Administration in cooperation with Congress. It was written by Richard L. Wagner, Jr., who served as NDWG Chairman. He is also former Deputy Director at the Lawrence Livermore National Laboratory and former Assistant to the Secretary of Defense for Atomic Energy.

The NDWG was supported by a generous grant from the Smith Richardson Foundation.

NUCLEAR DEFENSE WORKING GROUP (NDWG)
FINAL REPORT

The Nuclear Defense Working Group (NDWG) was chartered in 2007 as an independent advisory group, via a grant from a private foundation to the non-profit Center for the Study of the Presidency and Congress (CSPC), to advise federal agencies and the Congress on the threat of clandestine nuclear attack, including nuclear terrorism, and means for reducing and countering that threat.¹ The NDWG consists of a dozen former senior government officials and university and national lab scientists, all with long experience in the policy, programs, and technologies for dealing with this threat. Several of the members—working both inside and outside the government—helped to start a number of the current, relevant programs and organizations in the Department of Homeland Security (DHS), Department of Energy (DOE), Department of Defense (DOD), and the Homeland Security Council (HSC). (A list of NDWG members is at the end of this report.) This report summarizes the group’s views, as of early 2009, and recommendations to the Obama Administration and Congress for countering this threat.

Preventing and defending against nuclear terrorism should be among the highest national security priorities—perhaps *the* highest priority.

Nuclear terrorism is an extremely serious, long-term threat. Some current terrorist groups reportedly have aspirations in this direction, and long-term global trends carry no reason for optimism that these threats will diminish. The standard methodology for managing risk involves weighing the combination of the likelihood of an event and the consequences of the event. In this case, the likelihood of nuclear terrorist attacks simply cannot be estimated accurately, so managing the risk must be based mainly on the consequences. The consequences of a successful terrorist nuclear attack on the United States—or anywhere else, for that matter—would be enormous, extending possibly far beyond the immediate devastation, immense as that would be. The 60-year nuclear non-use tradition would be broken, with unforeseeable and possibly serious consequences. A series of social, political and/or cultural developments would be set in motion that could

¹ Following the usage of the 2004 Defense Science Board report on this same subject, “clandestine nuclear attack” refers to any attack using nuclear weapons, improvised nuclear explosive devices, or nuclear dispersal devices, delivered by any means other than military missiles or military aircraft. The weapons or nuclear materials could be made from scratch, bought, stolen, or provided by others. Clandestine nuclear attacks could be carried out by many kinds of perpetrators, including:

- Hostile nations (Smuggled weapons might be used in attacks because such attacks are much less attributable than, say, missile attacks. A nation’s Special Forces or clandestine services could deliver/smuggle the weapon);
- Terrorist groups working alone; or
- Nations and terrorist groups in various degrees of connection/complicity (Weapons could be delivered by terrorists or by a nation’s clandestine services or both. There is a wide range of possibilities).

This report will often use the term “nuclear terrorism” as shorthand to cover all of these possibilities.

challenge governments, the international order, and perhaps the future of democracy itself.

The experience of NDWG members encompasses several aspects of dealing with this threat, including:

- Limiting availability of nuclear weapons and materials to terrorists by pursuing non-proliferation and other threat-reduction efforts;
- Detection/discovery and interdiction, overseas and in the United States, of attacks with weapons/materials that adversaries may have succeeded in acquiring; and
- Post-event crisis management, including forensics and attribution of attacks.

These three elements are complementary parts of a layered, multi-dimensional approach to prevention and defense. Of course it would be best if proliferation could be rolled back and all nuclear weapons and materials could be made perfectly secure. But that is unlikely to happen for a long time, if ever, so detection/interdiction and crisis management are essential. Compared to other national- and homeland-security efforts, the United States and the international community do not spend adequately to counter this threat, and much more can and should be done on all three aspects of prevention and defense before running into fiscal limits.

Among these three elements, the NDWG has spent the bulk of its time as a group addressing detection/discovery and interdiction, because it is an essential element of the mix, a relatively new effort at the needed scale, and extremely difficult. Much of the remainder of this report will focus on discovery/detection and interdiction in strategic depth—globally away from our shores as well as near/in the United States.

Although detection/discovery and interdiction of nuclear terrorist attacks are extremely difficult, new technologies and operations can be developed that would make a significant difference and would be effective enough to warrant the effort and expense needed to achieve them.

A perfect defense cannot be achieved, and poor programmatic and policy decisions would be made if perfection were thought of as the goal. But the likelihood of success of an attempted attack can be significantly lowered through the combination of:

- Improved interdiction operations (including taking advantage of warning, when available, by surging operations based on prior preparations), enabled in part by
- Development and deployment of greatly improved technology, including but not limited to much better sensors², and
- Further disciplining the flow of global movement and commerce.

² Detection of nuclear radiation from threat objects often has been viewed—mistakenly—as the touchstone and metric for discovering and interdicting this threat. Radiation detection can and should be greatly improved, but it is only one of the new technologies needed. Furthermore, while new technology is essential, improved and more extensive operations are paramount. New technology and new operations must be designed to be complementary.

Synergies help this effort. For example, improved detection/interdiction is likely to induce attackers to behave in ways that result in increased signatures of attack, thus improving likelihood of warning and further improving defense effectiveness. Improved effectiveness will, in turn, increase the prospect of failure in the mind of the prospective attacker, which will dissuade some attacks that might otherwise have been attempted. The combination of improved interdiction and dissuasion will significantly decrease the likelihood of a successful attack. (Below, we will refer to the foregoing aggregation of concepts as the “theory of success”.)

Even well before the attacks of September 11, 2001, progress was made in developing programs and operational capabilities for detection and interdiction; these efforts were accelerated after 9/11. But there is much farther to go than the improvements already achieved. Progress has been much slower than it should and could have been, and we are concerned that—in the turmoil of competing priorities in national- and homeland-security—the progress so far made might not be sustained and accelerated.

Five specific things that need special attention in the Obama Administration and by the Congress—both in general for this threat and specifically for detection and interdiction—are: 1) ensuring continued high priority, 2) building stronger international consensus and programs, 3) improving strategic planning, 4) enhancing coordination and integration efforts at the national level and internationally, and 5) increasing funding. The remainder of this report addresses each of these needs.

Ensuring continued high priority

It should go without saying that the President must continue to give sustained priority to this issue as part of the nation’s defense. Establishing the position of Weapons of Mass Destruction (WMD) Coordinator on the National Security Staff is a step in the right direction, but it is far from sufficient. Our experience indicates that a key step should be to establish—at many levels within the relevant departments and agencies—dedicated responsibilities, organizations, and programs that are focused specifically on nuclear terrorism and not entangled with the many other aspects of WMDs and of terrorism. In effect, departments and agencies should be organized, to a much greater degree than today, around this specific threat. For example, DHS’s Domestic Nuclear Detection Office (DNDO) was established specifically to assure unity of effort and dedicated focus within DHS (and to some extent across the government) on this specific threat. DNDO’s operations should continue and be strengthened, with similar nuclear-dedicated offices/organizations set up elsewhere, including in DOD, the Federal Emergency Management Agency (FEMA) and the Department of Justice (DOJ). Throughout the government, most nuclear-threat related functions need to be more strongly focused and coordinated.

There are common methods of dealing with the many kinds of terrorism and with the many kinds of WMD. But due to the differences among WMD, defenses against them will suffer if they are all managed or conceptualized in common. It is a matter of striking

the right balances between common and threat-specific approaches, but the first step should be to make the threat-specific efforts robust.

Building stronger international commitment and participation, including detection/discovery and interdiction operations

To protect the United States, nuclear terror attacks must be stopped as far from our shores as possible. “Goal-tending”, or focusing only on efforts to combat WMD once they are here, is too risky. Likewise, a successful attack anywhere in the world would be catastrophic to U.S. interests abroad as well as to the international order.

There are now dozens of cooperative bilateral and multilateral programs and agreements related to dealing with nuclear terrorism—some nuclear-dedicated, others more broadly oriented. But the depth of the needed international commitment is lacking. There are several things that can be done to develop this:

- Nuclear terrorism should be featured in meetings between the President and other heads of state;
- The United States must make it clear to allies that our common objective is to prevent nuclear terrorism anywhere, and not just in the United States;
- The seriousness of the threat, the potential feasibility of preventing successful attacks anywhere, and the importance of international cooperation in doing so must be articulated even more forcefully; and
- The United States must also articulate for our international partners a better, more coherent strategic plan for dealing with this threat, including a better model of the kinds of cooperative, integrated multilateral operations needed.

Preventing nuclear terrorism is, or should be, part and parcel of the broader international effort to create a safer and more stable global nuclear weapon regime. Reinforcing this idea can also help build international commitment.

Improving strategic planning

The Administration, Congress and relevant departments and agencies have been disturbingly slow developing strategic planning for the programs that deal with this threat.

Strategic planning and systems engineering for the national and international “system of systems”—encompassing operations, improved technology and research and development (R&D) programs, and the architectures that embody them—must be improved. A nested set of spiral developments, procurements, and improvements in operations and technology must be properly time-phased and prioritized among different layers of defense and pathways of attack, overseas, near and within the United States. As guides to planning and monitoring progress, simulations and models of technologies and operations, including a coherent set of quantitative and qualitative metrics, should be

developed.³ The long-term funding profiles needed to support programmatic milestones in technology development and improvement of operations should be laid out and synchronized with programs. Planning would be better if it were based more directly on examination of specific scenarios.

Planners should place much more emphasis on preparations to augment (“surge”) defenses in various ways—over hours, days, weeks or months—when strategic or tactical warning of varying degrees of specificity is available. Planners should also analyze how the defense posture itself—operations, architecture and technology—and what is said about it can be used to shape perceptions of and to dissuade or mislead potential attackers.

All of the things discussed in the previous two paragraphs should be embodied in a net assessment that analyzes current capabilities versus the threat and lays out methods to progressively close off attackers’ options, even as those options evolve. At the core of this work should be an analytically sound “theory of success”, similar to that outlined at the bottom of page 2 and the top of page 3.

In all of this, much more can and should be done to develop and use what might be called the “systematics of terrorism and counter-terrorism”. The archives of terrorism and counterterrorism represent an immense database covering many decades, from which it should be possible to discern many things useful for planning programs and operations, such as 1) patterns of terrorist behavior that can guide how to develop technology and plan and operate defenses so as to better dissuade or discourage attacks, 2) how threat signatures might be evoked by how defenses operate, and 3) what types and specificity of warning might be available.

Enhancing coordination and integration among departments and agencies

Coordination and integration of operations is key as operations is the glue that holds architecture together. Detection/discovery and interdiction are operational activities that require close coordination among DHS, DOD, DOE, DOJ, the State Department, the intelligence agencies, state and local authorities, and international partners.

But the centrality of operations is one of the main things that make coordination difficult, in part because many of the operational capabilities needed for dealing with clandestine nuclear attacks are shared with operational capabilities for other purposes, including “conventional” counter-terrorism, bio-terrorism, border security, and other kinds of overseas military operations.

The National Security Council’s WMD Coordinator will address operational integration, but we believe that “jointness” across the government will build gradually (as it did

³ Many of the difficulties encountered by DHS’s Advanced Spectroscopic Portal (ASP) program could have been mitigated if metrics for and simulations of performance of existing and planned radiation detectors, and of operations with the detectors, had been available for planning the program and the tests associated with it, including phased improvements in ASP technology-alternatives themselves.

within DOD over many decades), accruing from increased interplay among the nuclear-terror-focused organizations in departments and agencies. At this point in time, the WMD Coordinator should focus mainly on leading government-wide strategic planning—for which a planning staff in the office of the WMD Coordinator will be needed—and on building stronger international cooperation, both of which are crucial, as we discussed earlier.

Increasing funding

Considerably more funding is needed for combating nuclear threats, including development and deployment of new technologies and detection/discovery and interdiction operations. This funding would help support a much wider range of operational capabilities, both day-to-day and for readiness to respond to tactical or heightened strategic warning, when and if it is available. Furthermore, R&D programs are moving slowly, often because available funding requires premature selection among competing approaches and serial rather than parallel development of promising technologies. R&D in this area is not yet programmatically or technically mature. (We note that the nation is spending much more on missile defense than on defenses against nuclear terrorism, although the latter is in many ways more serious. For example, in contrast to clandestine nuclear terrorist attack, which is difficult to attribute, missile attack is self-attributing and thus more deterrable.)

Nuclear Defense Working Group (NDWG) Members

- **Ambassador David Abshire**, President and CEO, Center for the Study of the Presidency and Congress (CSPC); former U.S. Ambassador to NATO
- **Dr. Robert August**, ARA, Inc.; former Senior Scientist, Naval Research Laboratory
- **Ambassador Linton Brooks**, former Undersecretary of Energy for Nuclear Security and Administrator of the National Nuclear Security Administration (NNSA)
- **Mr. Jonah Czerwinski**, Senior Fellow, IBM Global Leadership Initiative; former Director of Homeland Security Projects, CSPC
- **Dr. Fred Iklé**, former Director, U.S. Arms Control and Disarmament Agency; former Undersecretary of Defense for Policy
- **Dr. John Immele**, former Deputy Director, Los Alamos National Laboratory
- **Dr. Miriam John**, former Senior Vice President, Sandia National Laboratories
- **Ambassador Robert Joseph**, former Undersecretary of State for Arms Control and International Security
- **Dr. Glenn Knoll**, Professor Emeritus, University of Michigan
- **Mr. Kenneth Rapuano**, former Deputy Assistant to the President for Homeland Security
- **Dr. Jeffrey Richardson**, Department of the Air Force and Lawrence Livermore National Laboratory
- **Dr. Richard L. Wagner, Jr.**, Chairman, NDWG; Los Alamos National Laboratory; former Assistant to the Secretary of Defense for Atomic Energy