

**Nuclear Security Culture:
The Key to Sustainability**

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My boss, Sam Nunn, opened this meeting with scenarios meant to illustrate the dangers we face today from the use, and especially misuse, of nuclear materials. The underlying reality of those alarming scenarios stems from the comparative ease with which these nuclear materials can be misused, to devastating effect. In considering the challenges of sustaining security over nuclear materials, the good news is that protecting them is also comparatively easy—IF we give it the priority it deserves.

My colleague, Graham Allison, uses a compelling comparison: he notes, properly, that gold ingots don't go missing from Fort Knox, and that Russia doesn't lose jewels from the Kremlin Armory. In other words, we have chosen to create reliable security around gold and diamonds, but we have yet to give similar protection to the raw materials of nuclear bombs: plutonium—in any form—and highly enriched uranium.

Why have we not yet taken these steps? After all, gold and diamonds have little intrinsic value. Throughout civilization, human beings have ascribed them instrumental value owing to their beauty, their rarity, and their portable size. Gold and diamonds have value primarily as symbols—symbols of wealth and power, of love and fidelity, of the artist's skill. This is why my wedding ring is both priceless and useless, and why it threatens no one. Plutonium and uranium are even more difficult to create and because of this fact, the mere possession of nuclear materials is perceived to confer prestige and power. But even more than gold and diamonds, these materials have incredible intrinsic value: they can be made to yield heat and light. Properly controlled, this heat and light can sustain life, create wealth, and expand the boundaries of human knowledge. In the wrong hands, this heat and light of a nuclear weapon can end millions of lives, devastate property, cripple economies, and poison our air, water and soil.

So again, I ask: why haven't we yet achieved the "gold standard" of security for nuclear materials, around the globe? Why do we not yet treat uranium and plutonium with the respect

that their dual-edged power deserves? My only answer is that we haven't yet made it a priority. It's not a matter of technology—it's a matter of human judgment.

It is all too easy to consider nuclear security in the context of hardware, on one hand—barriers, cameras, alarms, tags and seals—and software, on the other—linking equipment into integrated systems to track materials, detect and defeat intrusions, and discourage insider diversions. And much has been accomplished in broadening the application and increasing the sophistication of both hardware and software, as we have heard in the discussions of the last three days. These advances are to be applauded and continued.

Hardware and software alone, however, are not enough: the critical element is what the technology community calls “wetware”—“all [the brain's] sparks and tastes and tangles, all its stimulus/response patterns” in the words of the science fiction writer who coined the term. In other words—the perceptions, judgments, and actions of human beings, individually and in groups, are what make the difference in nuclear security. Unless the people involved in nuclear materials management, from the janitor to the head of state, understand and respond to evolving threats, commit adequate resources, follow established procedures, and are held accountable—unless the necessary wetware is in place—all the hardware and software in the world will not prevent nuclear catastrophe.

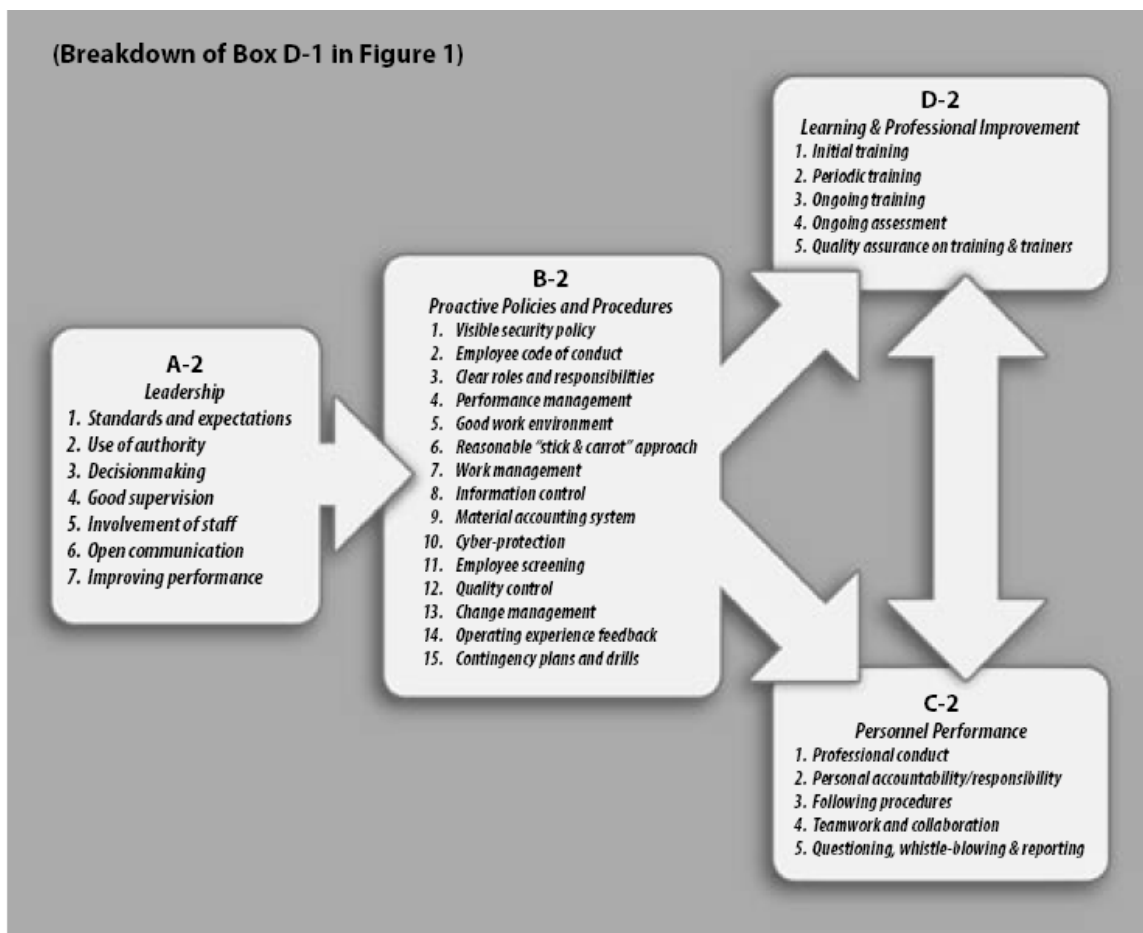
I would argue that the weak points of nuclear security are primarily connected to weaknesses in what we have come to call “nuclear security culture.” This phrase has been uttered often in the past three days, including by Dr. ElBaradei in his opening address. Too few people involved in nuclear security have truly internalized the threats we face today, and they are therefore not setting proper priorities. On one hand, world leaders have declared the threat of nuclear terrorism as the number one threat we face, and asserted that combating it is our top priority. Yet when we look at the obstacles to securing materials at a pace demanded by the urgency of this threat, we can pick out many other priorities that are competing against this supposedly “top” priority—and winning. Some examples:

- Security officials in both US and Russia are being permitted to sacrifice progress on bilateral nuclear security cooperation based on Cold-War era worries about theft of bomb designs—when we can each blow up the world several times over, these attitudes are at odds with the fact that our national survival depends on cooperation rather than confrontation.
- Lawyers in the US and Russia have been permitted to sacrifice progress on nuclear security cooperation over disagreements about who would pay damages in far-fetched scenarios of saboteurs secretly embedded in the Western companies who are providing assistance to Russia's nuclear industry.
- Diplomats around the world are being permitted to fight the application of binding international standards for nuclear security in a misguided attempt to preserve sovereignty and national pride.
- Nuclear institute directors around the world are being permitted to maintain unnecessary stocks of nuclear material out of a misplaced sense of prestige or unrealistic plans for future experiments.

- Nuclear facility guards have been permitted to shut down alarm systems to avoid the annoyance of frequent false alarms and to leave their posts in order to forage for food.
- Research reactor operators around the world are being allowed to continue using highly enriched uranium, despite the ready availability of alternative fuels for many of them.

By allowing these lesser concerns to “beat” the so-called top priority, we are all less secure. Truly sustainable nuclear security begins with the willingness—at all levels—to elevate nuclear security above these obstacles, even at the cost of real, but secondary, priorities.

Developing, promulgating, and enforcing this primary priority of nuclear security depends on the interlocking security culture mechanisms of management, policies, personnel and training. This diagram lists the key components of a security culture mechanism.



From *Nuclear Security Culture: The Case of Russia*, Igor Khripunov and James Holmes, (eds.), Center for International Trade and Security, University of Georgia: 2004

Beyond these elements, intangibles such as honesty, integrity, commitment, learning and leadership also play critical roles. These social constructs reflect the realities of societies at large. After a decade-plus of US-Russian cooperation in materials protection, control and accountability, projects are increasingly incorporating these cultural elements, as evidenced by the creation of nuclear security culture coordinators at many of the Russian sites where US assistance is being provided and the Bratislava Summit statement.

Still, differences in US and Russian approaches to nuclear security continue to create challenges for these critical cooperative efforts. After a decade in which this cooperation has primarily taken the form of hardware and software, the wetware still doesn't match. Russian officials continue to consider sustainability to be primarily to do with hardware and software: replacement parts for installed equipment, upgrades for computer systems, maintenance on established security systems. US officials have begun emphasizing the wetware: reliable funding streams, commitment to follow procedures, and a management culture that emphasizes the centrality of the nuclear security mission. NTI has funded the US and Russian Academies of Sciences to evaluate the progress of US-Russian cooperation in nuclear security toward "indigenization"—in other words, making the transition from annual commitments of US funds to a system that is financed, maintained and managed by Russia in a way that responds effectively to evolving threats.

This process is likely to take some time, as well as some significant changes in Russian culture writ large. Igor Khripunov and his colleagues of the University of Georgia—who have been working on nuclear security culture issues for several years, and from whom the chart above is drawn—have analyzed the application of these general principles in Russia, including the impact of Russia's totalitarian past, its weak economy and ageing nuclear infrastructure, its fluid bureaucratic environment, and its deep-seated social challenges. Russia's nuclear complex cannot be isolated from this social context.

Nevertheless, there is room for optimism: recent statements on the risks of nuclear terrorism by the head of the Russian Federal Security Service and the Chief of the General Staff seem to be stepping back from the traditional Russian approach of sweeping public denials of any risks to Russian weapons and materials. To build on this progress, the recent University of Georgia study (available on NTI's website at www.nti.org) recommends nine steps to improve security culture in Russia:

1. Increase funding for security arrangements
2. Introduce more transparency
3. Accelerate nuclear security programs
4. Make the legal basis more comprehensive and instructions more user-friendly
5. Expand independent monitoring and oversight
6. Focus training on security culture
7. Encourage a system of incentives for personnel
8. Introduce a system of external evaluation and self-assessment, and
9. Develop public awareness programs.

In highlighting these steps, we must recognize that Russia is far from the only nation in which security culture needs improvement—ideally, this is a continuous, globally applied process of accountability and innovation. A supportive international environment would facilitate and expand the efforts undertaken by Russia and other countries to promote security culture. Several existing nuclear security institutions can be placed in service of this goal:

- The International Atomic Energy Agency should use its leadership and authority to develop an internationally acceptable concept of nuclear security culture and launching

appropriate information sharing and training programs in selected countries. It should take the lead role in promoting this concepts.

- The Global Partnership Against the Spread of Weapons and Materials of Mass Destruction, launched by the G-8 but now numbering over 20 nations, is a valuable vehicle to raise the visibility of security culture for all nations with nuclear responsibilities. Non-US donors should incorporate these concepts in their cooperative efforts with Russia and other recipients as part of the goal to transform these relationships from patronage to partnership.
- UN Security Council Resolution 1540 can play a useful role in bolstering nuclear security culture through its universal, mandatory application of “effective, appropriate” national mechanisms to prevent terrorist use of weapons of mass destruction. Its reporting provisions should be broadened to require information from nations about their efforts to cultivate security culture among nuclear personnel, in order to encourage them to give this concept the priority it deserves.
- The Institute for Nuclear Materials Management, an international professional organization for stewards of nuclear material, can help document and promulgate “best practices” in securing and accounting for nuclear materials, a role initiated under a joint NTI-INMM workshop series bringing together nuclear materials managers from around the world to share best practices.

We may find, however, that new institutions are necessary to fill in the gaps between formal, binding standards, and the real threats we face today and in the future. This is why NTI is exploring the concept of creating an organization of nuclear facilities operators to apply best practices in nuclear materials management around the world. Such an organization might be conceptually modeled along the lines of the World Association of Nuclear Operators, which provides training, peer reviews and information sharing related to the safety of operations for nuclear power reactors worldwide. A similar voluntary approach to improving nuclear materials security might be considered as an adjunct to the more formal requirements of national regulations and international treaties. Such an organization would certainly emphasize the critical role of security culture in sustaining nuclear materials security.

These steps will bring us closer to the “gold standard” of protection these materials demand of us. And while we press forward, on one hand, to achieve this standard in time to prevent the devastation of nuclear terrorism, we must also realize the awesome timeframe over which this stewardship must be sustained: the half-lives of plutonium-239 and uranium-235, respectively, are 24 thousand years, and 713 million years. A deep-seated understanding of the power of these materials is the only path to this kind of sustainability.