

TOWARD A NUCLEAR FIREWALL: BRIDGING THE NPT'S THREE PILLARS

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There is no clear, internationally accepted definition of what activities or technologies constitute a nuclear weapons program. This lack of definition encumbers nuclear energy cooperation and complicates peaceful resolution of proliferation disputes. A “nuclear firewall” could enhance the distinction between nuclear weapons-related activities and other non-weapons uses of nuclear technology. Applying a firewall framework for analyzing nuclear programs could improve international governance of nuclear technology and facilitate peaceful nuclear cooperation and disarmament. It could also expand the time and means available to key states and international bodies, such as the International Atomic Energy Agency and United Nations Security Council, to diplomatically resolve impending proliferation crises.

Defining Nuclear Weapons

The Nuclear Non-Proliferation Treaty (NPT), which establishes the norms and rules that guide the international management of nuclear technology, does not define the term nuclear weapon. Nor does it identify the evidence that would determine whether a state is seeking to manufacture or acquire nuclear weapons.

Such definitional and analytic ambiguity exacerbates the task of distinguishing whether components, equipment, nuclear materials, and facilities are related to nuclear weapons programs or, instead, are for purely peaceful applications of nuclear technology. It also complicates national and international deliberations over the legitimate boundaries for peaceful civil nuclear applications, as well as the handling of proliferation risks and responses.

The Carnegie Endowment for International Peace has developed an analytic approach—a nuclear firewall—to help distinguish between activities and programs that are purely peaceful and those that merit definition as nuclear weapons-related. Like an information-system firewall, the nuclear firewall would

- identify those activities, materials, and equipment that should be inhibited because they are purely or strongly associated with nuclear weapons programs;
- distinguish activities that should be facilitated because they are fully consistent with peaceful applications of nuclear technology and know-how; and
- assess in-between activities depending on transparency and reassurance measures that states would undertake.

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The Firewall Framework

To develop the firewall, the Carnegie team worked with leading technical and policy experts from nuclear weapon and non-nuclear-weapon states to identify pertinent indicators and contextual factors that demarcate peaceful from nuclear weapons activities. Tested against historical case studies, the endeavor yielded a framework that can withstand challenges posed by the lack of complete and accurate information about a country's activities and the possibility of deliberate efforts at deception.

The process predictably revealed that (1) technical parameters alone are rarely sufficient to draw reliable assessments about the overall orientation of a country's nuclear program; and (2) in some cases, the *absence* of certain activities, items, or policies can better indicate whether a program's stated purpose is indeed peaceful.

The resulting multidimensional framework—designed to be country-neutral, transparent, and easily employed—has several features:

- **Evaluates the presence *and* absence of activities, equipment, materials, patterns of behavior, and the broader context.** The firewall assesses whether these elements—individually and collectively—are compatible with the purposes states proffer for them. The identity of a country should not prejudice analysis of its nuclear program.
- **Provides insights into the nature and direction of nuclear programs and helps assessment of potential proliferation concerns.** The firewall can suggest which combinations of particular actions and other indicators should, over time, increase or decrease the sense of assurance or level of concern about a given state's nuclear-related activities, which could inform discussion of such concerns in national or multilateral settings.
- **Augments effective implementation of all three pillars of the NPT, namely nonproliferation, the peaceful use of nuclear energy, and disarmament.** By helping users to systematically identify weapons-oriented activities and enhance policy options for redressing them—the firewall can facilitate legitimate applications of peaceful nuclear energy and highlight ways that states can reassure others of the peaceful orientation of their programs. Further, by identifying comprehensive indicators of nuclear weapons programs, it addresses a necessary condition for progress toward disarmament. For without a technologically detailed template for defining how to turn military nuclear programs into purely peaceful ones, nuclear disarmament will not fully enhance security and therefore will not be politically achievable.

While elements of the framework have been vetted with distinguished international experts, governments and civil society should study them and consider which might merit further technical development and which might be ripe for implementation in multiple institutional settings. A firewall application could be employed by individual states assessing proliferation risks and making decisions about strategic trade controls, by international organizations and in multilateral forums, and by academic institutions and the nonproliferation community more broadly. Carnegie stands ready to assist with these efforts.

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