

EE190: Nuclear Weapons, Risk and Hope

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These notes relate to the level of risk nuclear weapons pose, a subject on which the class wanted to hear some more.

How Credible Is Deterrence?

We often hear of the need to maintain a credible deterrent. For example, in May 2009, the bipartisan Congressional Commission on the Strategic Posture of the United States said in its [final report](#):

Our non-proliferation strategy will continue to depend upon US extended deterrence strategy as one of its pillars. Our military capabilities, both nuclear and conventional, underwrite US security guarantees to our allies, without which many of them would feel enormous pressures to create their own nuclear arsenals. So long as the United States maintains adequately strong conventional forces, it does not necessarily need to rely on nuclear weapons to deter the threat of a major conventional attack. But long-term US superiority in the conventional military domain cannot be taken for granted and requires continuing attention and investment. Moreover, it is not adequate for deterring nuclear attack. *The US deterrent must be both visible and credible, not only to our possible adversaries, but to our allies as well.* [emphasis added]

Which leads to an important question: How credible is the threat of using nuclear weapons? The threat usually is believed to have significant credibility in terms of deterring an all-out nuclear attack on American soil, but even there, questions arise. As an example, consider the following excerpt from a 2003 [book review](#) of a 1990 book, *Nuclear Deterrence Theory: The Search for Credibility*, by Robert Powell. The reviewer, Branislav L. Slantchev, is an Associate Professor of Political Science at UCSD:

To be effective in influencing the expectations of the opponent (and thereby help secure a good outcome), threats and promises ... have to be credible. If they are not believable, then the opponent will not revise its expectations. Schelling then proposed several ways of how credible commitments can be established. A very famous one is the strategy of constraining one's own options: by deliberately weakening oneself in this way, one can emerge in a stronger bargaining position because *a commitment that one is unable to escape from has the ultimate credibility*. ... Another strategy that Schelling proposed involved the deliberate creation of risk of shared disaster. If the outcome one wants to threaten with is so bad even for the threatener, then the opponent will not believe it. Instead of threatening this outcome, one can instead create a risk of it occurring. The pressure of this risk can be the threat. Schelling called this the "strategy that

leaves something to chance” and it essentially involves the deliberate manipulation of risk. [emphasis added]

Note how close this strategy is to the Doomsday Machine in the movie *Dr. Strangelove*. In that fictional account, the Soviets had created a vast array of buried nuclear weapons with an automatic triggering mechanism that would set it off and destroy the biosphere if a nuclear attack on Soviet cities was ever detected by an automatic sensor network. The following exchange between the American president and his advisor, Dr. Strangelove explains how such a device creates the ultimate, credible deterrent:

President Muffley: But, how is it possible for this thing to be triggered automatically, and at the same time impossible to untrigger?

Dr. Strangelove: Mr. President, it is not only possible, it is essential. That is the whole idea of this machine, you know. Deterrence is the art of producing in the mind of the enemy [pause] the fear to attack. And so, because of the automated and irrevocable decision making process which rules out human meddling, the doomsday machine is terrifying. It's simple to understand. And completely credible, and convincing.

Nuclear deterrence has even more difficulty with credibility when it comes to protecting our allies. Would an American president really utilize our full military power, up to and including the use of our entire nuclear arsenal, in the event of an attack on an ally or friend, particularly (as is often the case) if the attack was not without some justification, at least in his own eyes? How credible can such a guarantee be?

These really are questions, and I look forward to hearing your thoughts on them.

Risk of Nuclear War

If you haven't yet read "[Soaring, Cryptography and Nuclear Weapons](#)," I highly recommend that you do so. It lists six steps that resulted in the 1962 Cuban Missile Crisis as well as five and a half recent steps that resemble those. If the last half step had occurred, the 2008 Cuban Bomber Crisis might well have been as famous. Instead, almost no one has heard of it.

Some other recent events which help illuminate the risk:

In a February 2010 [article concerning NATO](#) (search on *Karaganov* to find the article in question), an influential Russian wrote: "Moreover, and we must be unequivocal about this very unpleasant truth, the possibility of further NATO expansion to Ukraine, which Russia views as a vital threat to its security, has the potential to revive the long-forgotten specter of a large-scale war in Europe, which could escalate unpredictably."

The author, Sergei Karaganov, is Chairman of the IISS Board of the Council for Foreign and Defense Policy, and Deputy Director of the Institute of Europe at the Russian Academy of Sciences. According to Wikipedia, he served on the International Advisory Board of the Council on Foreign Relations from 1995 until 2005 and is a close associate of Yevgeny Primakov, and has been Presidential Advisor to both Boris Yeltsin and

Vladimir Putin. His comments are similar to a number of others I have seen over time. The threat that Russia feels should Georgia and Ukraine be brought into NATO should not be underestimated. To some extent, it might be likened to Canada and Mexico joining the Warsaw Pact if it still existed.

With that background, it can be seen that significant risk was inherent in July 2008 joint US exercises with both the Ukraine and Georgia. For example, according to a July 15, 2008, Voice of America News report:

Georgian and U.S. troops have begun joint military maneuvers on Georgian soil, as tensions between the former Soviet republic and neighboring Russia continue to escalate.

About 1,000 U.S. servicemen and 600 Georgians will train for three weeks at a military base near the Georgian capital, Tbilisi. Small contingents from Ukraine, Armenia and Azerbaijan are also participating.

The Georgian Defense Ministry says the maneuvers were planned months ago, and are not related to tensions between the Tbilisi government and two Russian-backed Georgian breakaway regions, Abkhazia and South Ossetia.

Georgian President Mikhail Saakashvili's attempts to move his country toward NATO have also angered Moscow.

Meanwhile, Russia Tuesday launched its own military exercises in the North Caucasus region. A Russian Defense Ministry spokesman, Yuri Ivanov, said the Russian exercises have "nothing to do" with the Georgian-U.S. maneuvers. Authorities say about eight thousand Russian troops are taking part.

Abkhazia and South Ossetia declared independence from Georgia in the early 1990s, sparking fighting and the dispatch of Russian peacekeepers to the regions. Georgia has accused the Russians of backing separatists in both regions, and has vowed to bring the territories back under central government control.

In a separate development, Georgia's parliament Tuesday approved a 5,000-strong increase in the country's military, bringing the total number of soldiers to 37,000. Lawmakers also approved a nearly 27 percent increase in military spending.

Of course, the Georgian war broke out less than a month later in August 2008. The risk was increased by [earlier promises](#) made by President Bush ("The path of freedom you have chosen is not easy but you will not travel it alone. Americans respect your courageous choice for liberty. And as you build a free and democratic Georgia, the American people will stand with you.") as well as [statements](#) by then Vice President candidate Sarah Palin that Georgia and Ukraine should be admitted to NATO and that the U.S. should be prepared to go to war if Russia invades Georgia again.

Risk of Nuclear Terrorism

Matthew Bunn's 2007 doctoral thesis [*Guardians at the Gates of Hell: Estimating the Risk of Nuclear Theft and Terrorism*](#) provides copious examples of the dangers, but at 466 pages is probably too copious. I have therefore extracted [four pages of notes](#) with some of the most relevant material. Bunn also has a 2009 article in *Daedalus*, (Volume 138, Issue 4, Fall 2009, pp 112-123) which says in part:

At a minimum, such facilities and transport routes must be well protected against one well-placed insider; two small teams of well-armed, well-trained outsiders; or both working together. This corresponds to the threat revealed in the attack on the Pelindaba site in South Africa in November 2007, when two armed teams attacked from opposite sides of the site. One of the teams got through a 10,000-volt security fence, disabled intrusion detectors without detection (apparently with insider knowledge of the security system), proceeded to the emergency control center (where they shot a site worker in the chest), and spent 45 minutes inside the guarded perimeter without ever being engaged by site security forces. As far as is known, they never entered the area of the site where hundreds of kilograms of weapons-grade HEU are stored; but nevertheless, this is the kind of lapse that simply should not be allowed to occur at sites handling the essential ingredients of nuclear weapons. Today, there are many facilities with plutonium or HEU that are not effectively protected against this level of threat.

A [2008 report](#), *WORLD AT RISK: The Report of the Commission on the Prevention of WMD Proliferation and Terrorism*, whose authors include former Senators Bob Graham (D-FL) and Jim Talent (R-MO), said in part:

The Commission believes that unless the world community acts decisively and with great urgency, it is more likely than not that a weapon of mass destruction will be used in a terrorist attack somewhere in the world by the end of 2013. The Commission further believes that terrorists are more likely to be able to obtain and use a biological weapon than a nuclear weapon.