

Eliminate the launch-on-warning option for U.S. ballistic missiles

Frank von Hippel, 15 November 2020^{1*}

Summary

US Strategic Command maintains virtually all its intercontinental ballistic missiles (ICBMs) and the submarine-launched ballistic missiles (SLBMs) that it has on station at sea on alert so that they can be launched within minutes on warning of an incoming nuclear attack. The purpose of this option is to be able to get the ICBMs launched before they can be destroyed and, more generally, to launch a US counterstrike while the US nuclear command, control and communication (NC³) system is intact.

Launch on warning is controversial, however, because the warning may be due to an equipment failure, human error or a hack into the warning system. Also, keeping the missiles launch ready increases the danger that they could be launched by mistake, malfeasance or hacking. This is a hugely important issue because mistaken launch by either the US or Russia could result in a global disaster involving more than a billion deaths.

A launch on warning must be almost preprogrammed. The longest flight time of a ballistic missile attacking the US from Russia or China would be about 30 minutes and the flight time from an offshore ballistic-missile submarine could be as little as ten minutes. Subtracting the times required to determine the targets of the incoming missiles and to implement any decision for response before the estimated arrival time leaves at most ten minutes or so for consideration and debate.

Given that even a ragged US retaliatory response to a nuclear strike by another country would be totally devastating to that country, launch on warning is not required to deter a first strike on the United States. The US should abandon its launch on warning posture because it increases rather than decreases the probability of massive nuclear use.

A history of false warnings

There were [four documented cases](#) of false warnings of incoming Soviet attacks on the US during 1979 and 1980 and two known cases of false warnings in the Soviet Union and Russia in [1983](#) and [1995](#) respectively. We do not know how many false warnings have not been publicly reported.

The launch-on-warning option has been debated within the US government since the Kennedy Administration but apparently [was adopted by the 1970s](#). Because of his concern about accidental nuclear war, President Reagan wanted to negotiate an agreement with the Soviet Union [to eliminate ballistic missiles in favor of bombers](#). Although not without risk (see the classic 1964 film, *Fail-Safe*), unlike ballistic missiles, nuclear bombers can be recalled after launch.

Both Presidents [G.W. Bush](#) and [Obama](#) came into office proposing to take the ICBMs off “hair trigger.” Once in office President Obama pursued the issue but [retreated](#) in the face of opposition from Strategic Command and Russian disinterest in doing so on a

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reciprocal basis. (Russia's and China's ballistic missile submarines [are not as survivable](#) as those of the United States.)

In 2018, [Congress instructed the Department of Defense](#) (DOD) to “contract with a federally funded research and development center to conduct a study on the potential benefits and risks of options to increase the time the President has to make a decision regarding the employment of nuclear weapons.” The DOD selected the Institute for Defense Analyses (IDA), which produced a report that appears to reflect Strategic Command's thinking on the subject.

The contribution of launch on warning to deterrence

The [report](#) acknowledged the danger of mistaken launch and suggested possible ways to reduce the danger. It argued against de-alerting the ICBMs, however, because its authors believed that the option of launch on warning is important to deterring a Russia nuclear attack:

“If Russia were confident that it will be able to destroy U.S. ICBMs on the ground, along with fixed bomber, [nuclear-capable] fighter-bomber, and SSBN [ballistic missile submarine] bases, it would be more optimistic about its chances of leaving the United States with a small nuclear force after the attack and no choice but to capitulate. Second, the capability to launch ICBMs promptly adds an element of speed and unpredictability that makes adversaries less self-assured that they can favorably manage escalation. Before conducting a large-scale nuclear strike on the United States, Russia would likely require confidence that it could convince U.S. leaders to back down, rather than comprehensively retaliate against Russia. However, if Russia knows that the U.S. president has minutes to contemplate ordering a nuclear strike, potentially with hundreds of nuclear weapons, the possibility of an escalatory U.S. response would make it less likely to risk a disarming first strike.”(p. 15)

The idea that Russia would be tempted to mount an attack on US nuclear forces in the belief that the US might have “no choice but to capitulate” because it would be left with as few as eight ballistic missile submarines at sea carrying about 700 warheads with 100-500 kiloton yields (4-12 Hiroshimas each) reflects thinking that McGeorge Bundy, President Kennedy's national security advisor, criticized in his 1969 article, [“To Cap the Volcano”](#):

“There is an enormous gulf between what political leaders really think about nuclear weapons and what is assumed in complex calculations of relative ‘advantage’ in simulated strategic warfare. Think-tank analysts can set levels of ‘acceptable’ damage well up in the tens of millions of lives. They can assume that the loss of dozens of great cities is somehow a real choice for sane men. They are in an unreal world. In the real world of real political leaders –whether here or in the Soviet Union – a decision that would bring even one hydrogen bomb on one city of one's own country would be recognized in advance as a catastrophic blunder; ten bombs on ten cities would be a disaster beyond history; and a hundred bombs on a hundred cities are unthinkable.”

It is understandable that nuclear-attack planners would desensitize themselves to the consequences if their plans were carried out with terms such as “collateral damage” when discussing the human consequences of, for example, tens of nuclear explosions on command posts and communication nodes in Moscow. It is also understandable that they

would want to keep those plans secret but the result is indeed unthinkable. In 1961, President Kennedy asked the Joint Chiefs of Staff how many people the nuclear war plan he had inherited would kill. Daniel Ellsberg, then working in the Pentagon, saw the response: 600 million deaths or, [as he described it](#), “A hundred Holocausts.” The US targeted China and the Soviet Union and Eastern Europe together in the Single Integrated Operations Plan (SIOP) at the time. The direct casualties from a US-Russian exchange today would still be multiple Holocausts, however.

The [climate](#) and economic effects of a large nuclear exchange between Russia and the US would be catastrophic for non-target countries as well. Large fractions of their populations would probably starve. The survivors would require decades to restore some semblance of modern civilization.

The connection between launch-on-warning and counterforce

In a 1998 interview, four years after he retired as the first commander of the US combined Strategic Command, General George Lee Butler warned that, if it was believed that an incoming attack had been detected, the briefing that would be given by Strategic Command to an inevitably inadequately prepared President on her/his options would be strongly biased toward launch on warning.

General Butler indicated that Strategic Command’s plans for a response to a major attack *required* launching its alert ballistic missile warheads. The ballistic-missile submarines not on station on alert could constitute a strategic reserve as a deterrent against further attack by either Russia or a third country.

Butler [said](#) that, to assure that the President would agree to launch before incoming Russian warheads damaged the effectiveness of the US nuclear deterrent, Strategic Command had

“built a construct that powerfully biased the president’s decision process toward launch *before* the arrival of the first enemy warhead. And at that point, all the elements, all the nuances of limited response just went out the window. The consequences of deterrence built on massive arsenals made up of a triad of forces now simply ensured that neither nation would survive the ensuing holocaust.”

The imperative of not allowing a Russian first strike to reduce the effectiveness of the US retaliation has resulted in Strategic Command not taking all possible measures to prevent a mistaken US nuclear attack. Specifically, when US ballistic missiles are flight tested with dummy nuclear warheads, they are equipped with systems to allow their destruction in flight on radio command if they go astray. Command destruct systems are [not installed](#) nuclear-armed ballistic missiles, however, for fear that Russian hackers might be able to use the system to neutralize a retaliatory US attack.

De-alerting ballistic missiles

The only instance we are aware of some US ICBMs being “de-alerted,” i.e. taken off their usual launch-ready posture, was in 1991 when the Soviet Union was beginning to collapse. President George H.W. Bush ordered the de-alerting of 450 US Minuteman II missiles that were to be retired under the START Treaty and President Gorbachev stated that Russia would reciprocate.

In a 1998 interview, General Eugene Habiger, then Commander in Chief of US Strategic Command, asserted that Russia had not fulfilled Gorbachev's de-alerting commitment. He also rejected the possibility of a mistaken nuclear launch by either the US or Russia and described how demoralizing it had been for the young officers keeping watch in the Minuteman II launch-control facilities to have their launch keys taken away from them.²

Four years later, however, in 2002, after he had retired, General Habiger had freed himself somewhat from Strategic Command's assurance that nothing bad could happen. [Testifying in 2002](#) in favor of Senate ratification of the Bush Administration's 2002 Strategic Offensive Reductions Treaty, he urged that,

“we have to find a way to move more weapons off alert status and give leaders more decision time...

“I recommend that the President begin by ordering an immediate stand-down of the nuclear forces we plan to reduce under the treaty. This includes four Ohio class Trident submarines and all 50 Peacekeepers [the 10-warhead MX ICBMs]. This would advance our own security and help build confidence in our intentions.”

Apparently, although General Habiger believed he could prevent disaster while he was in command, he was not so confident in his successors.

De-alerting was rejected in the Trump Administration's Nuclear Posture Review, which [repeated an objection](#) made in the Obama Administration nuclear posture review,

“The de-alerting of U.S. ICBMs would create the potential for dangerous deterrence instabilities by rendering them [the ICBMs] vulnerable to a potential first strike and compelling the United States to rush to re-alert in a crisis or conflict....”

Again, one can question that a “dangerous deterrence instability” might be caused by 400 US warheads being vulnerable to a massive attack that would deplete Russia's strategic forces more than those of the US and leave 600 or more US warheads invulnerable in eight to ten US ballistic missile submarines hidden in the vastnesses of the North Atlantic and North Pacific oceans. Would a Russian leader be willing to accept retaliation by 600 US warheads but be deterred by the possibility of launch under attack of an additional 400? It is shocking that such transparently absurd arguments can be brought forward to justify a posture that threatens our civilization.

According to the logic of Strategic Command and probably its Russian counterparts as well, however, if nuclear war seemed inevitable, destroying as much as possible of the enemy's forces before they could be used might save some lives and infrastructure that could be used to rebuild after a nuclear holocaust. This discounts entirely the possibility of a mistaken launch. Strategic Command's refusal to consider de-alerting to reduce the danger of mistaken launch makes elimination of the vulnerable ICBMs altogether the only alternative to maintaining the status quo.³

The vulnerability of nuclear command-and-control

² Discussion with Bruce Blair, Harold Feiveson and Frank von Hippel, Strategic Command headquarters, January 1998.

³ See e.g. Frank von Hippel, “Minuteman III intercontinental ballistic missiles need not and should not be replaced because of the danger of their launch-on-warning posture,” 14 November 2020 on this website.

Even if the US eliminated its ICBMs, however, the vulnerability of the U.S. nuclear command, control, communication (NC³) system would still result in pressure for launch on warning of the alert ballistic missiles on invulnerable ballistic missile submarines .

The concern is that the US nuclear command could be “decapitated” by attacks on the White House, the nuclear command posts, and on key communication links through which launch commands would be transmitted.

The [Institute for Defense Analyses report](#) warns,

“If a president feared that the NC³ system was fragile, he or she might feel pressure to order nuclear strikes before the system degrades, particularly in a situation where a president thought that he or she might not survive.” (p. 14)

The IDA report argues that preserving the option of launch on warning deters Russia from exploiting the vulnerability of the US NC³ system,

Once again, the idea that the US could be disarmed by a first strike ignores US ballistic missile submarines at sea. Even in peacetime, US ballistic missile submarines have done patrols as long as 140 days. This would provide ample time for them to connect with a reconstituted US leadership. Also, US ballistic missile submarines carry their fire-control keys locked in safes. The unlock codes for the safes would have to be transmitted from a central command post. However, the submarines are likely to have equipment on board that could be used to cut open the safes if the crews agreed to do so. It would be foolhardy for Russia to assume that there would be no US retaliation after a decapitation attack.

Nevertheless, the vulnerability of command and control would be destabilizing in a crisis so severe that nuclear war seemed like a serious possibility. This is why Russia has invested in its [“Dead Hand”](#) launch system and why US analysts who worry about accidental nuclear war [argue](#) for giving the highest priority to modernization of the US nuclear command, control and communication systems. A [credible presidential succession plan and credible plans for staffing the successors](#) are also critical.

The importance of communication between opposing nuclear forces

Frequent communication between the opposing nuclear forces is also key to reducing the danger of nuclear war between Russia and the US – or China and the US.

If opposing nuclear weapon states demonize each other, as the US and the Soviet Union did during the most tense parts of the Cold War, they are more likely to believe that the other country *would* be willing to launch a first strike. This is why it was so important for tension reduction for Gorbachev and Reagan to agree and repeat at their summits the mantra, “A nuclear war cannot be won and must never be fought”.

But tension reduction requires more than summit statements. It requires engagement at lower levels as well. Arms-control negotiations provide one venue for such engagement. The US had such negotiations almost continually throughout the Cold War. Unfortunately, the 2002 decision by the George W. Bush Administration to scrap the ABM Treaty, which limited Russian and US ballistic-missile defenses, has made new agreements limiting offensive nuclear weapons more difficult. Indeed, [it has stimulated](#)

Russia to develop new types of offensive weapons and China to build up its strategic nuclear arsenal.

After the end of the Cold War, the heads of the US and Russian nuclear weapons laboratories engaged with each other as colleagues,⁴ [as did the heads of the two strategic commands](#). This has stopped, due in the fact that the US stopped treating Russia as an equal after the collapse of the Soviet Union and in part due the paranoia of the Putin Administration and its interference in the internal affairs of the US and other democracies.

Regardless of their adversary relationship, however, neither country wants a nuclear war and they must continue to prioritize mutual reassurance in their nuclear relationship.

Conclusions and recommendations

The most important issue in nuclear-weapon policy is preventing a nuclear war. Eliminating launch-on-warning could be a significant contributor to reducing the probability of such a catastrophe. Given that the US has several hundred nuclear weapons survivable at sea at all times, the decrease in deterrence would be negligible.

A major source of Strategic Command's objection to dealerting continues to be that described by General Butler: not wanting to lose warheads that are key parts of its nuclear strike plan. That concern could be eliminated by eliminating US ICBMs.⁵ If it was felt necessary, this reduction could be offset by adding an equal number of warheads to US SLBMs.

A second concern driving the launch-on-warning posture is the vulnerability of the US nuclear command, control and communication system to attack. Here again, however, the extended survivability of hundreds of nuclear warheads on ballistic-missile submarines at sea would mean that delayed but still devastating US retaliation would be possible for several months after an attack on US command and control. No adversary could be confident that command and control over US submarines could not be restored within that length of time or that, within the months that they could stay at sea after a nuclear attack on the US, they might not launch in the absence of such a command.

Additional reading

Bruce G. Blair, "Loose cannons: The president and US nuclear posture," *Bulletin of the Atomic Scientists*, Volume 76(1), 2020, <https://doi.org/10.1080/00963402.2019.1701279>

⁴ *Doomed to Cooperate: How American and Russian Scientists Joined Forces to Avert Some of the Greatest post-Cold War Nuclear Dangers*, Siegfried Hecker, ed. (Los Alamos, Bathtub Row Press, 2016).

⁵ Frank von Hippel, "Minuteman III intercontinental ballistic missiles need not and should not be replaced."