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## IN DEFENSE OF NUCLEAR NONPROLIFERATION

### The Existential Crisis Posed by Nuclear Deterrence

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#### Summary

Nuclear deterrence has remained the global military strategy among nuclear powers since 1945. As it currently stands, this theory is outdated and impractical, as it rests upon assumptions which no longer encapsulate the present-day geopolitical landscape. As such, traditional nuclear deterrence poses an existential threat to us all.

#### Key points

- Nuclear deterrence theory rests upon the assumptions of rationality, complete communication, and purposeful use.
- It does not protect anyone from incompetent, irrational, unofficial, (i.e., non-state actors) or unchecked leadership.
- The US must lead the way in committing to an updated nuclear security paradigm.

## Introduction

Nuclear proliferation poses an existential threat to global security. The best path forward is the global reduction of nuclear proliferation. This is in direct opposition to the policy of nuclear deterrence, which poses dire security risks. Additionally, mitigating the nuclear threat has been made substantially more urgent by the rise of personalist dictatorships. This paper ultimately argues that policymakers need to respond to recently-nuclear or potentially-nuclear states by adhering to the norms of nuclear restraint, pursuing multilateral steps to globally reduce the spread of nuclear weapons, negotiating a treaty which addresses and amends the pitfalls of the Nuclear Nonproliferation Treaty (NPT) and adopting strategies specifically tailored to deterring personalist dictators from using nuclear weapons.

## The History of Nuclear Deterrence

Deterrence theory holds that one actor's strategic use of threats can be deployed in order to discourage an adversary from taking a specific course of action, or to force a desired course of action. A threat is a deterrent insofar as it prevents its target from carrying out a specific action because of the costs associated with that action which the target would incur. Strategic deterrence has been invoked as a military tactic for thousands of years. As Chinese military strategist Sun Tzu wrote in the fifth century, "To fight and conquer in all your battles is not supreme excellence; supreme excellence consists in breaking the enemy's resistance without fighting...Therefore the skillful leader subdues the enemy's troops without any fighting. With his forces intact he will dispute the mastery of the Empire, and thus, without losing a man, his triumph will be complete" (Tzu).

Deterrence has been a cornerstone of military strategy for over two and a half millennia, but nuclear deterrence was first invoked in 1945, at the end of World War II. According to the theory of nuclear deterrence, if a nuclear threat is issued from one state to another, and the threat is credible and perceived as likely to cause sufficient devastation, an attack (or other specific behavior) will be prevented from occurring.

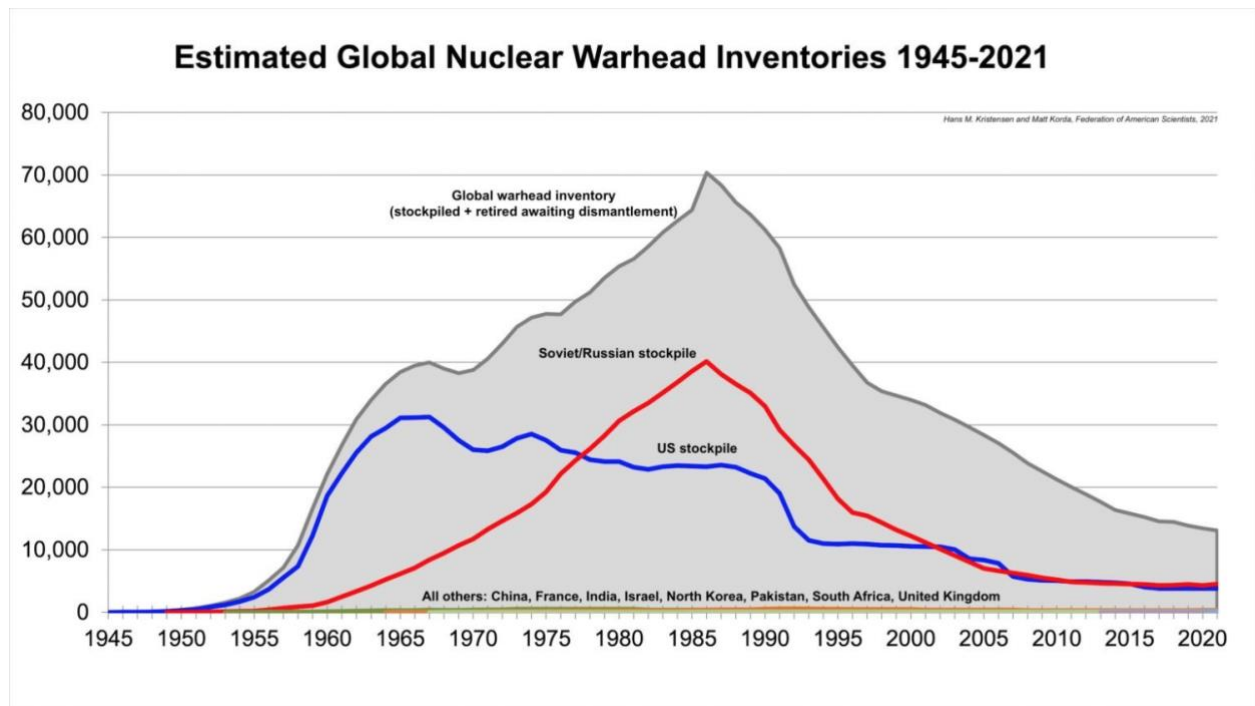
## The Cold War and the Birth of Nuclear Deterrence

Nuclear weapons stockpiled by the United States and the Soviet Union during the Cold War were intended to deter other states, via the threat of retaliation and mutually assured destruction, from attacking with their own nuclear weapons. Since a successful nuclear deterrent requires a country to preserve its ability to retaliate by responding before its own weapons are destroyed or by ensuring a second-strike capability, certain states with nuclear weapons have implemented a nuclear triad. The nuclear triad is a three-part nuclear strategy which consists of land-launched nuclear missiles, nuclear-missile-armed submarines, and strategic aircraft with nuclear bombs and missiles. The United States, Russia, China and India have all implemented a nuclear triad.

The nuclear arms race between the U.S. and the Soviet Union during the Cold War irreversibly altered the nature of U.S. military strategy. Indeed, both countries had to reconsider the political nature of weapons which had previously been regarded solely for their military power. "This qualitative shift laid the foundation for formulating the philosophy that nuclear weapons play a predominantly political role, rather than a military one" (Arbatov, 2019).

## Reduction Since 1986: Numbers Don't Tell the Whole Story

At the peaks of their respective nuclear arsenals (in the early 1960s for the US and the late 1980s for the Soviet Union), collectively “the two superpowers—which accounted for approximately 98 percent of the global nuclear arsenal—had accumulated a destructive power equivalent to about 3 million Hiroshima-class bombs” (Arbatov, 2019). By 1986, the number of nuclear weapons worldwide peaked at approximately 70,300. This outrageously redundant number has since substantially decreased, partially thanks to arms control measures such as the Intermediate-Range Nuclear Forces Treaty (INF), which was signed by US President Ronald Reagan and Soviet General Secretary Mikhail Gorbachev in 1987, and the first Strategic Arms Reduction Treaty (START I) between the two powers, which entered into force in 1994. Currently, the global count of nuclear weapons is approximately 13,450 (Kristensen & Korda, 2021).



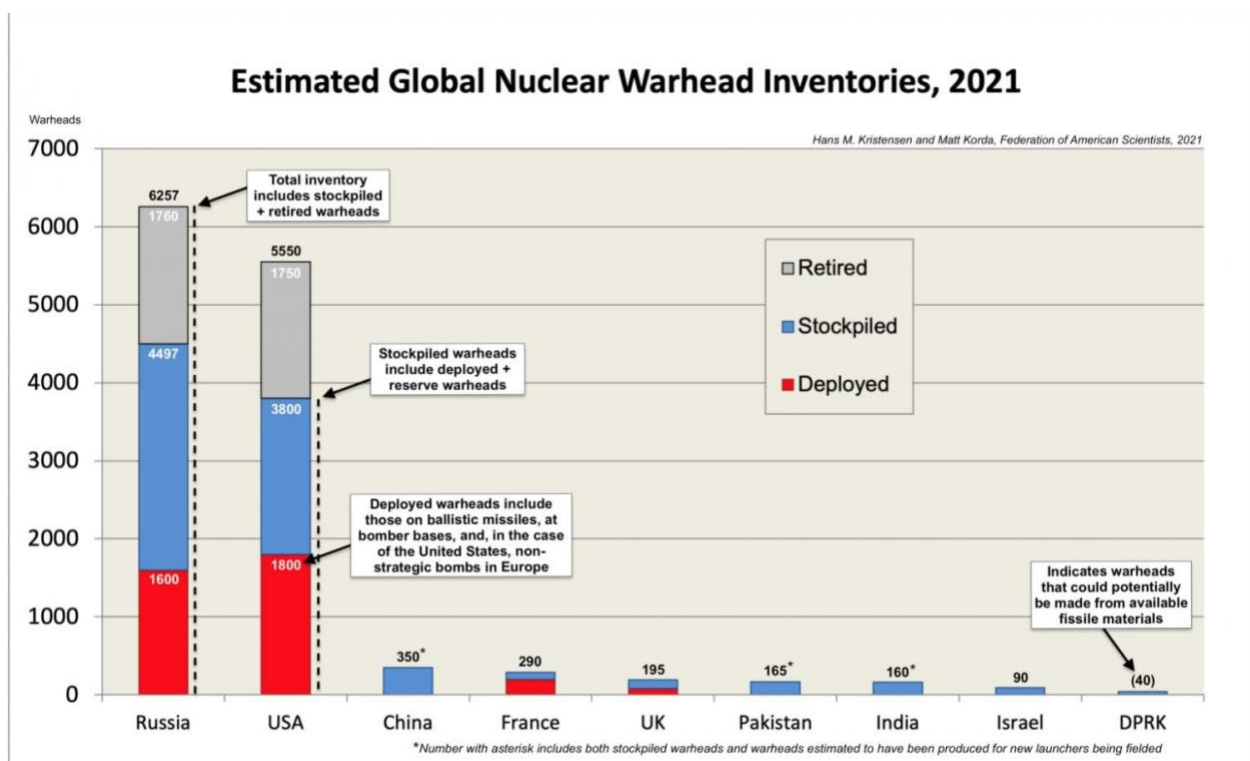
**Source:** Kristensen & Korda, 2021

However, numbers alone fail to paint a clear picture. The significant reduction in nuclear weapons since the late 1980s isn't necessarily the result of worldwide nuclear reduction efforts. As the graph above indicates, “[global nuclear arms] reduction has slowed significantly compared with the 1990s” and the reduction “appears to continue only because of dismantlement of retired weapons” (Kristensen & Korda, 2021). What's more, the nuclear weapons that are currently operational in national defense arsenals are far more powerful than those that were stockpiled during the Cold War. In terms of destructive power, nuclear weapons today simply cannot be compared to nuclear weapons from the 1980s. This means that the massive decrease in the quantity of nuclear weapons does not necessarily translate to a qualitatively different global military strategy, i.e., a less nuclear one. In fact, “instead of planning for nuclear disarmament, the nuclear-armed states appear to plan to retain large arsenals for the indefinite future, are adding new nuclear weapons, and are increasing the role that such weapons play in their national strategies” (Kristensen & Korda, 2021).

The continued proliferation of nuclear weapons is senselessly redundant. As former commander of the US Strategic Command, General George Lee Butler argued in 1999, “it is imperative to recognize that all numbers of nuclear weapons above zero are completely arbitrary; that against an urban target one weapon represents an unacceptable horror; that twenty weapons would suffice to destroy the twelve largest Russian cities with a total population of twenty-five million people, one-sixth of the entire Russian population; and therefore that arsenals in the hundreds, much less in the thousands, can serve no meaningful strategic objective” (Butler, 2013). Clearly, the hawkish fervor for nuclear weapons worldwide has been carried out at the expense of a rational security strategy.

## The Many Problems with Deterrence

Today, deterrence is still the military doctrine invoked by nuclear states, of which there are currently five. The US, Russia, UK, France, and China (listed in order of acquisition) are recognized as nuclear-weapons states under the NPT, of which these states are parties. India, Pakistan, and North Korea also possess nuclear weapons, but are not parties to the NPT (North Korea was formerly a party of the NPT, but withdrew in 2003). Israel is universally believed to possess nuclear weapons, but the state has not publicly confirmed nor denied this, maintaining a policy of deliberate ambiguity.



**Source:** Kristensen & Korda, 2021

Nearly 80 years after it was introduced, nuclear deterrence theory is still the military doctrine in use among nuclear-weapons states. This doctrine desperately needs to be updated. As the doctrine currently stands, it renders humanity terrifyingly vulnerable to nuclear catastrophe, because there are several key pitfalls inherent in nuclear deterrence.

# Pitfalls of Nuclear Deterrence

## 1. Only a Theory

Firstly, nuclear deterrence theory is just that—a theory. It dictates that a credible threat of nuclear retaliation from one actor to another prevents a nuclear attack altogether. Since the birth of nuclear deterrence theory in 1945, there has yet to be a nuclear attack. That being said, this is not necessarily thanks to deterrence. There is no counterfactual which indicates that deterrence theory has resulted in the prevention of nuclear attacks. To attribute the absence of nuclear attacks to nuclear deterrence would be a false assumption of causality.

## 2. Assumption of Rationality or Strong Enough Institutions

Another problem with nuclear deterrence is the classic problem that is inherent in game theory: deterrence is based upon the assumption that actors—those individuals with the power to deploy nuclear weapons—are rational. This assumption does not hold up. It is conceivable that state leaders will not act rationally at all times, especially when operating under the immense stress of an impending nuclear attack (regardless of whether the threat of attack is real or not). With that said, irrational leadership in and of itself does not necessarily threaten deterrence, so long as there are institutions in place which are strong enough to keep irrational behavior in check. Deterrence theory rests upon the assumption that only purely rational decisions will be made by the individuals holding the nuclear codes, either as a result of the individuals themselves behaving rationally, or because there are institutions in place which prevent irrational decision-making. Neither of these scenarios can be blindly accepted, particularly in the case of personalist dictatorships, which will be addressed below.

## 3. Communication Challenges

Another classic game theory issue which is present in nuclear deterrence theory is the possibility of incomplete information. Intelligence isn't always comprehensive and other indirect forms of communication (speeches, press conferences, interviews, news, etc.) can be misleading and even purposefully incorrect. Actors may have incentives to lie about their nuclear capabilities and intentions, thereby confounding nuclear deterrence theory. As such, deterrence theory does not hold when communication between actors is inhibited.

## 4. Non-State Actors

Additionally, nuclear deterrence theory does not apply to non-state actors (i.e., terrorist organizations). Unlike a sovereign nation, non-state actors are not bound to a specific geographic location, nor to geopolitical norms. Retaliation against non-state actors would be confounded by their geographic fluidity. Furthermore, terrorists, unlike national governments, are often willing to die in order to commit an act of terror (i.e., suicide attacks). In such instances, the nuclear capabilities of a target would not act as a deterrence.

## 5. No Room for Accidents

Perhaps one of the direst problems associated with nuclear deterrence is that it accounts only for intentional use, not accidental use. Nuclear deterrence doesn't prevent mistakes. Moreover, once a nuclear ballistic missile is launched, it cannot be recalled. As the Union of Concerned Scientists explains, "There is no way to recall a nuclear ballistic missile once it has been launched, and they do

not have self-destruct mechanisms. Even if the military or president realized immediately that a launch was mistaken, there would be nothing they could do to stop the missile from reaching its target” (Union of Concerned Scientists, 2015). This fact is especially disturbing in light of the nuclear near-accidents which have been uncovered in declassified documents, interviews, and testimonies since 1945. In 2014, Chatham House released a report enumerating thirteen nuclear near-accidents which occurred between 1962 and 2002. These cases are listed in chronological order in the chart below.

### Incidents of near nuclear use

Date	Incident	States involved	Cause
October 1962	Operation Anadyr	Soviet Union	Miscommunication
27 October 1962	British nuclear forces during the Cuban missile crisis	United Kingdom	Conflict escalation
27 October 1962	Black Saturday	United States	Conflict escalation and miscommunication
22 November 1962	Penkovsky false warning	Soviet Union	Espionage
October 1973	1973 Arab–Israeli war	Israel	Conflict escalation
9 November 1979	NORAD: Exercise tape mistaken for reality	United States	Exercise scenario tape causes nuclear alert
3 June 1980	NORAD: Faulty computer chip	United States	Faulty computer chip
25 September 1983	Serpukhov-15	Soviet Union	Technical error
7–11 November 1983	Able Archer-83	Soviet Union, United States	Misperception of military training exercise
18–21 August 1991	Failed coup	Soviet Union	Loss of command and control structure
25 January 1995	Black Brant scare	Russia	Mistaken identity of research rocket launch
May–June 1999	Kargil crisis	India, Pakistan	Conflict escalation
December 2001–October 2002	Kashmir standoff	India, Pakistan	Conflict escalation

**Source:** Lewis et al., 2014

The report also describes examples of “recent sloppy practice” (Lewis et al., 2014). The first was in August 2007, when six US nuclear-armed cruise missiles were missing for 36 hours after they were mistakenly loaded onto a United States Air Force (USAF) B-52H heavy bomber at Minot Air Force Base in North Dakota and transported to Barksdale Air Force Base in Louisiana (Raaberg, 2007). The nuclear warheads in the missiles were supposed to have been removed before the missiles were taken from their storage bunker. “Had the plane experienced any problem in flight, the crew would not have known to follow the proper emergency procedures with nuclear weapons on board” (Lewis et al., 2014). The missiles with the nuclear warheads were not reported missing, and remained mounted to the aircraft at both Minot and Barksdale for 36 hours. During this period, the warheads were not protected by the various mandatory security precautions for nuclear weapons.

The report also details instances of misconduct which occurred throughout 2013 within the United States Air Force and Navy. These multiple instances of misconduct are embarrassing for the US government at best. The mishandling of nuclear warheads by personnel at the highest levels of the US military emphasizes how close we have come to a nuclear catastrophe. In 2013 Major General Michael Carey, who was responsible for all 450 of the US arsenal’s intercontinental ballistic missiles was fired for personal misbehavior. The reason for his firing was never officially confirmed, though it was likely related to alcohol use and gambling habits (Stewart & Alexander, 2013).

In September of the same year, the US Navy suspended Vice Admiral Tim Giardina, who was second in command of the US Strategic Command. He was suspended after the military launched



an investigation into allegations of his use of counterfeit chips at a casino near his base in eastern Nebraska. Giardina's suspension occurred after the 341st Missile Wing at Malmstrom Air Force Base in Montana, overseeing one-third of the US land-based nuclear arsenal, failed a safety and security inspection (2013).

In April of 2013, two officers (one from the 91st Missile Wing Air Force Base in North Dakota and one from the aforementioned 341st Missile Wing at Malmstrom Air Force Base in Montana which failed its safety and security inspection) were sanctioned for sleeping on the job with the blast door open behind them. During questioning, the first officer admitted "to having committed the same fault on previous occasions without getting caught. Moreover, air force officers told the Associated Press that such violations of the safety procedures had happened more often than in the two documented cases" (Lewis et al., 2014).

As these egregious examples of serial mishandling of nuclear weapons at the highest levels of the US military emphasize, the doctrine of nuclear deterrence does not protect anyone from incompetent leadership. Clearly, within states like the US, which have had nuclear weapons for decades, there are legitimate concerns about accidental use. As one would expect, the concerns about accidental use are more acute in poorer states, which are considered recently-nuclear or potentially-nuclear states.

## 6. Recently and Potentially-Nuclear States

As of March 2021, about 30 countries are considering, planning or starting nuclear power programs. Of these countries, three—Belarus, Bangladesh and Turkey—are constructing their first nuclear power plants (2021). As the number of states with nuclear weapons capabilities increases, so too does the risk of nuclear miscalculations. This is especially problematic in states with recently-acquired nuclear technology, such as North Korea. As of November 2020, North Korea is believed to possess over 60 nuclear weapons, as well as missiles that are capable of striking the United States (Albert, 2020), which is notable because, as far as Pyongyang is concerned, the United States poses the greatest threat to North Korea.

One of the biggest causes for concern over North Korea's nuclear progress is the fact that erroneous reports of incoming missiles may not necessarily be detected by North Korean missile detection technology. For example, in January of 2018, the Hawaii Emergency Management Agency mistakenly reported that a ballistic missile was heading for Hawaii, causing widespread panic. However, in Washington DC, highly sophisticated missile sensors were able to detect that the report was actually a mistake. The type of technology that enabled US officials to discount an erroneous report does not exist in recently-nuclear states like North Korea. In other words, "if someone in North Korea issued an erroneous warning of an attack, no alternative system would correct it. And it's unlikely that the military in North Korea would report a serious mistake, because if a bureaucrat or a military officer makes an error in North Korea, he doesn't just get fired; he might also get executed" (Sagan, 2018).

## 7. The Danger Posed by Personalist Dictatorships

The dangers of a nuclear North Korea are exacerbated by a key factor: its personalist dictatorship. Personalist dictatorships, or personalistic authoritarian regimes, are regimes in which all the power lies within one individual. Within personalist dictatorships, access to power hinges on the discretion of the dictator, unlike other forms of dictatorships (monarchic, single-party, military, etc.), where some power is delegated to other institutions. Indeed, "[t]hese [personalist] dictatorships differ from other

autocratic governments because their leaders have such dominant personal power that other state institutions—such as parties, politburos, or military officers—cannot overrule the decisions made at the top. Personalist dictators can make decisions on a whim, which creates a grave challenge to the concept of nuclear stability” (Sagan, 2018).

The best example of a personalist dictator is Kim Jong-un of North Korea. Russian President Vladimir Putin and Turkish President Recep Tayyip Erdoğan (both of whom either already have, or will soon have, access to nuclear weapons), have been consolidating their authoritarian rule into personalistic regimes as well. These types of dictators pose dire threats to global security. As former U.S. national security advisor, H.R. McMaster, argued in an interview with ABC News in 2017, “[C]lassical deterrence theory, how does that apply to a regime like the regime in North Korea?” (Sagan, 2018). Indeed, how can we expect deterrence theory to faze any “regime that engages in unspeakable brutality against its own people?” (Sagan, 2018). Clearly, deterrence theory must be updated in order to account for ruthless personalist dictatorships.

## 8. Deterrence is Outdated

Nuclear deterrence is the military doctrine that has been invoked by nuclear powers for nearly 80 years. It was first established in 1945, in a bipolar world order. Since then, this doctrine has become outdated and impractical. As it currently stands, nuclear deterrence presents risks to humanity. General George Lee Butler was in charge of all US nuclear weapons at US Strategic Command before his retirement in 1994. In a speech at the University of Pittsburgh in 1999, he argued that nuclear deterrence is “a slippery intellectual construct that translates very poorly into the real world of spontaneous crises, inexplicable motivations, incomplete intelligence and fragile human relationships” (Butler, 2013).

Nonetheless, nuclear deterrence still has value as a military doctrine, but only as long as it is accompanied by robust international negotiations, norms of nuclear restraint, and bona fide non-proliferation agreements. As Alexey Arbatov, head of the Center for International Security at the Primakov National Research Institute of World Economy and International Relations argues, “Nuclear deterrence can serve as a pillar of international security only in conjunction with negotiations and agreements on the limitation, reduction, and nonproliferation of nuclear weapons. Without them, deterrence fuels an endless arms race, while any serious crisis between the great powers will bring them to the brink of nuclear war” (Butler, 2013).

## Potential Solutions

In order to ensure global security is not based upon assumptions of rationality, luck, and the goodwill of personalist dictators, a new security paradigm is necessary. As a world power, the United States must lead the way if any real progress is to be made. In order to amend nuclear deterrence as it currently stands, the recent threat posed by personalist dictatorships with nuclear capabilities must be addressed. Since personalist dictators are unlikely to be concerned about the welfare of their subjects in the event of any kind of warfare, the United States, and all other democratic nuclear states, must commit to targeting the political leadership and military forces, as opposed to the civilians, of personalist regimes which initiate acts of aggression. And to be clear, the United States must make explicit that *only* acts of military aggression will be met with military (including nuclear) force. Furthermore, this strategy will be more successful if the United States makes clear that “any military



commander in a personalist dictatorship who disobeys a command to use nuclear weapons will not be held responsible for the consequences of his leader's aggression" (Sagan, 2018). This strategy updates nuclear deterrence according to the threat posed by specific personalist adversaries.

Secondly, the US must commit to taking its nuclear weapons off "hair-trigger alert." Currently, the US and Russia keep their operational nuclear missiles on "hair-trigger alert" or "launch on warning." This means that these missiles can be launched within minutes. In other words, a land-based missile from the US could strike Russia in approximately 30 minutes, and a submarine-based missile could strike within 10 to 15 minutes after launch (Union of Concerned Scientists, 2015). This rapid launch status was implemented during the Cold War, when the US and the Soviet Union both feared preemptive nuclear attacks from each other, in which case "hair-trigger alert" systems were considered necessary deterrents by both countries. However, this context no longer reflects reality. Now, the US has nuclear missiles in enough locations throughout the country, and world, that it is no longer possible for any single nuclear attack on the US to eliminate all of its operational nuclear weapons. Indeed, according to a 2012 security assessment by the Pentagon, "even in the unlikely event that Russia launched a preemptive attack on the U.S.—and had more nuclear capability than current international agreements allow for—it 'would have little to no effect on the U.S. assured second-strike capabilities'" (*No One Should Have Sole Authority to Launch a Nuclear Attack*, 2017).

Beyond being unnecessary, the "hair-trigger alert" system is highly dangerous, as it increases the risk of an accidental launch, as well as a purposeful launch, in response to a false warning. As discussed earlier in this paper, there have been many nuclear close calls as a result of miscalculation and miscommunication. In addition, there is reasonable concern about the possibility of cyber attacks on missile detection systems. De-alerting nuclear missiles would dramatically reduce the unnecessary risk of accidental or deliberate and misinformed launches. This view was shared by former U.S. Vice Chairman of the Joint Chiefs of Staff General James E. Cartwright who led the Global Zero Commission on Nuclear Risk Reduction in 2015. The Commission called for an end to the Cold War-era practice of keeping nuclear weapons on hair-trigger alert. The Commission's proposal, "backed by more than 75 former senior political officials, national security experts and top military commanders, makes the case that a multinational de-alerting agreement could greatly mitigate the many risks of nuclear weapons use, including from computer error, cyber launch, accidental detonations, unauthorized 'insider' launch, false warning of enemy attack, and rushed nuclear decision-making" (Global Zero, 2015).



*While world leaders met at the UN Headquarters in New York 2015 for the Non-Proliferation Treaty (NPT) Review Conference, Global Zero projected the image of a “sitting duck” on the UN Headquarters building.*

**Source:** Global Zero, 2015

Lastly, the United States and all other nuclear states must pursue multilateral steps towards adhering to nuclear nonproliferation. The 2021 Review Conference of the Parties to the Treaty on the Non-Proliferation of Nuclear Weapons (NPT) is tentatively scheduled to meet 2–27 August 2021 in New York, COVID restrictions permitting. Since it entered into force in 1970, the NPT has managed to prevent the proliferation of nuclear weapons to most countries and decrease the global nuclear weapon stockpile. However, there are significant problems with the Treaty as it currently stands, “including the NPT’s universality, the extent and pace of nuclear disarmament, the measures to advance the peaceful use of nuclear energy, and the NPT’s inability to prevent non-signatories India, Israel, and Pakistan from crossing the nuclear threshold and to prevent former NPT signatory North Korea from becoming a nuclear-armed state” (Kutchesfahani, 2018).

The NPT needs to be updated in order to effectively address current geopolitical challenges. An updated international nonproliferation treaty must address the following areas where the NPT falls short: tackling the issue of non-state actors acting as nuclear suppliers, implementing adequate enforcement mechanisms of nonproliferation provisions (perhaps through the UN), increasing the costs of defection from the NPT, pushing for universality of membership, and scrapping the decision-making by consensus model of the NPT.

## Conclusion

The world has drastically changed since the invocation of nuclear deterrence as a security doctrine in 1945. There are no longer only two states with known nuclear arsenals. As such, the limits of nuclear deterrence as a viable theory cannot be overstated. Indeed, to illustrate what is at stake should nuclear deterrence fail to prevent a nuclear strike, historian Alex Wellerstein created the websites NUKEMAP

and MISSILEMAP.<sup>1</sup> Both websites allow users to select any location in the world, as well as the yield of the weapon that will detonate. The websites then estimate the number of casualties resulting from the type of strike the user has selected (not including the casualties that would occur as a result of radioactive fallout). For example, according to NUKEMAP, 150 kiloton cruise missile (which is currently in the U.S. arsenal) was dropped on London, there would be an estimated 340,760 fatalities and 1,098,440 injuries. These websites offer a sobering picture of the consequences of nuclear warfare.

To avoid the catastrophic risks posed by nuclear weapons, nuclear deterrence theory must be revised. This means the US, followed by all other nuclear states, must commit to the norms of nuclear restraint, employ new tactics to deter personalist dictators from developing and using nuclear weapons, and revise the Treaty on the Non-Proliferation of Nuclear Weapons.

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<sup>1</sup> Can be found here: <https://nuclearsecrecy.com/nukemap/>, <https://nuclearsecrecy.com/missilemap/>.

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