

**FORUM:** Disarmament and International Security Committee (GA1)

**QUESTION OF:** Decreasing the operational readiness of nuclear weapons systems

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## INTRODUCTION

Operational readiness for nuclear-weapon systems simply means the preparedness and readiness of such weapons or systems to be deployed and launched, if need be, with success and within a small amount of time. The list ranges from taking care of the atomic stockpile to the maintenance of functional delivery systems, which include missiles and bombers, and the training and evaluation of personnel associated with the weaponry. Further, operational readiness necessitates viable command structures that can hasten decision-making processes as well as enable coordination in high pressure circumstances. This state of alertness is kept through intense exercises, checks and upgrades to ensure they are continually reliable, protected from unauthorized access, and perform properly without failure or malfunctioning.

For global safety and deterrence, the operational readiness of nuclear weapons is a significant worldwide concern because these powerful arms must always be ready for use. Should any country have poorly maintained or insecure nuclear weapons, this would lead to an increased likelihood of accidental launches, unauthorized use or inability to respond to threats that could then have catastrophic consequences. Moreover, geopolitical stability depends on the preparedness of nuclear weapons as the countries count on their deterrence capability to avoid conflicts. Additionally, keeping these systems dependable, safe and tightly controlled contributes towards peace maintenance and averting further international tension escalation.

Reducing nuclear weapons systems' operational readiness is closely related to the conference's subject, "Ethos vs. Progress: Reassessing our Values in a Fragile World." This decision means that there has been a change of heart towards giving more importance to humanitarian concerns and global security, thereby showing devotion to ethics rather than constant pursuits for military prowess. This lowering of the readiness of such systems

indicates that human beings have learned the massive destruction nuclear bombs can cause and how vulnerable our world is, therefore. It is a sign that diplomacy and intercontinental cooperation are thus improving as well as the stability and assurance in the globe and. Such a view maintains that real progress is in the decrease of the human being's exposure to dangers and an increase in unity for a society free of dangers and. Thus, it negates the argument that security is in the readiness to face war.

## DEFINITION OF KEY TERMS

### **Operational Readiness**

“The capability of a unit/formation, ship, weapon system, or equipment to perform the missions or functions for which it is organized or designed.”<sup>1</sup>

### **Strategic weapons system**

“Any weapons system designed to strike an enemy at the source of his military, economic, or political power. In practice, this means destroying a nation’s cities, factories, military bases, transportation and communications infrastructure, and seat of government.”<sup>2</sup>

### **Hair-Trigger Alert**

A hair-trigger alert is an increased readiness level used on US nuclear weapons. This provides for a rapid launch of missiles; often kept in a ready-to-launch status, with around-the-clock launch crews ready, they can be launched in as few as ten minutes.<sup>3</sup>

### **De-alerting**

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<sup>1</sup> “Combat Readiness Definition.” *MilitaryDictionary*, [www.militarydictionary.org/term/combata-readiness](http://www.militarydictionary.org/term/combata-readiness). Accessed 19 Sept. 2024.

<sup>2</sup> “Strategic Weapons System.” *Encyclopædia Britannica*, Encyclopædia Britannica, Inc., [www.britannica.com/technology/strategic-weapons-system](http://www.britannica.com/technology/strategic-weapons-system). Accessed 19 Sept. 2024.

<sup>3</sup> “What Is Hair-Trigger Alert?” *Union of Concerned Scientists*, [www.ucsusa.org/resources/what-hair-trigger-alert](http://www.ucsusa.org/resources/what-hair-trigger-alert). Accessed 19 Sept. 2024.

De-alerting refers to the introduction of reversible changes in nuclear weapons, their launch and/or command and control systems, so as to increase the time required for launching these weapons.<sup>4</sup>

### **Deterrence**

Deterrence is in politics the strategy of developing a lot of military power so that other countries will not attack your country.<sup>5</sup>

### **Nuclear Non-Proliferation Treaty (NPT)**

“The NPT is a landmark international treaty whose objective is to prevent the spread of nuclear weapons and weapons technology, to promote cooperation in the peaceful uses of nuclear energy and to further the goal of achieving nuclear disarmament and general and complete disarmament.”<sup>6</sup>

### **Intermediate-Range Nuclear Forces Treaty (INF)**

Under the terms of the Intermediate-Range Nuclear Forces (INF) Treaty, all nuclear and conventional ground-launched ballistic and cruise missiles with a range of 500–5,500 kilometers had to be eliminated, permanently, by both the US and the Soviet Union.<sup>7</sup>

### **Nuclear Command and Control (NC2)**

The President, as the head of state and chief executive, exercises responsibility and direction over nuclear weapons operations through established command lines.<sup>8</sup>

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<sup>4</sup>“De-Alerting Nuclear Forces.” *Defense Technical Information Center*, [apps.dtic.mil/sti/citations/ADA536263](https://apps.dtic.mil/sti/citations/ADA536263). Accessed 19 Sept. 2024.

<sup>5</sup>“Deterrence.” *Encyclopædia Britannica*, Encyclopædia Britannica, Inc., [www.britannica.com/dictionary/deterrence](https://www.britannica.com/dictionary/deterrence). Accessed 19 Sept. 2024.

<sup>6</sup> “Treaty on the Non-Proliferation of Nuclear Weapons (NPT).” *United Nations Office for Disarmament Affairs*, [disarmament.unoda.org/wmd/nuclear/npt/](https://disarmament.unoda.org/wmd/nuclear/npt/). Accessed 19 Sept. 2024.

<sup>7</sup> “The Intermediate-Range Nuclear Forces (INF) Treaty at a Glance.” *The Intermediate-Range Nuclear Forces (INF) Treaty at a Glance | Arms Control Association*, [www.armscontrol.org/factsheets/intermediate-range-nuclear-forces-inf-treaty-glance](https://www.armscontrol.org/factsheets/intermediate-range-nuclear-forces-inf-treaty-glance). Accessed 19 Sept. 2024.

<sup>8</sup>“Nuclear Matters Handbook 2020 [Revised].” *NMHB 2020 [Revised]*, [www.acq.osd.mil/ncbdp/nm/NMHB2020rev/chapters/chapter2.html](https://www.acq.osd.mil/ncbdp/nm/NMHB2020rev/chapters/chapter2.html). Accessed 19 Sept. 2024.

### **No-First-Use Policy (NFU Policy)**

A "No First Use" policy aims at removing first use of nuclear weapons. Such an NFU policy would strictly limit, at least in theory, the circumstances under which a president can consider deploying nuclear weapons. It would enhance the signaling by the United States that nuclear weapons are for deterrence rather than war.<sup>9</sup>

### **UN Office for Disarmament Affairs (UNODA)**

"The United Nations Office of Disarmament Affairs (UNODA) provides support to disarmament issues, preventive measures, and regional disarmament efforts."<sup>10</sup>

### **Nuclear Risk Reduction Centers (NRRCs)**

Information about missile attacks, nuclear accidents, and maritime disasters would be shared using this coupling of proposed facilities. Under normal circumstances, these could provide a channel of information of crucial kinds, and in a crisis, they could yield a reliable channel of communication.<sup>11</sup>

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<sup>9</sup> "No First Use: Frequently Asked Questions." *Center for Arms Control and Non-Proliferation*, 20 Apr. 2021, [armscontrolcenter.org/issues/no-first-use/no-first-use-frequently-asked-questions/](https://armscontrolcenter.org/issues/no-first-use/no-first-use-frequently-asked-questions/). Accessed 19 Sept. 2024.

<sup>10</sup> "United Nations Office of Disarmament Affairs (UNODA)." *The Nuclear Threat Initiative*, 5 May 2022, [www.nti.org/education-center/treaties-and-regimes/un-office-of-disarmament-affairs/](https://www.nti.org/education-center/treaties-and-regimes/un-office-of-disarmament-affairs/). Accessed 19 Sept. 2024.

<sup>11</sup> "The Origins of the Nuclear Risk Reduction Center – 1980s." *U.S. Department of State*, [www.state.gov/history-of-the-national-and-nuclear-risk-reduction-center/](https://www.state.gov/history-of-the-national-and-nuclear-risk-reduction-center/). Accessed 19 Sept. 2024.

## BACKGROUND INFORMATION

### Development of nuclear weapons

#### **World War II and the Manhattan Project<sup>12</sup>**

The Manhattan Project focused on rapid development of atomic bombs for immediate use in World War II. Minimal effort and planning were invested in achieving operational readiness. The arsenal management and readiness relationships that were developed into nuclear strategies at the end of the war were necessitated by a decision to drop atomic bombs on Hiroshima and Nagasaki. At the height of the arms race in the early Cold War period, the United States and the Soviet Union then implemented policies to reduce operational readiness to prevent accidental launches that could lead to a wider and more dangerous conflict—eventually shifting to arms control agreements directed toward the stabilization of nuclear arsenals and risk reduction.

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<sup>12</sup> Kingdom, Colin S. Gray - United, and Dr. Colin S. Gray was Emeritus Professor of Strategic Studies at the University of Reading. "Nuclear Strategy – A Tale of Consequence." *Military Strategy Magazine*, 22 Apr. 2020, [www.militarystrategymagazine.com/article/nuclear-strategy-a-tale-of-consequence/](http://www.militarystrategymagazine.com/article/nuclear-strategy-a-tale-of-consequence/) . Accessed 24 Sept. 2024. "Atomic Diplomacy." *U.S. Department of State*, [history.state.gov/milestones/1945-1952/atomic](https://history.state.gov/milestones/1945-1952/atomic) . Accessed 24 Sept. 2024.

"The Atomic Bomb and the End of World War II." *National Security Archive*, 17 May 1941, [nsarchive.gwu.edu/briefing-book/nuclear-vault/2020-08-04/atomic-bomb-end-world-war-ii](https://nsarchive.gwu.edu/briefing-book/nuclear-vault/2020-08-04/atomic-bomb-end-world-war-ii) . Accessed 24 Sept. 2024.

### Cold War Era (1947-1991)<sup>13</sup>

Operational readiness took center stage in both U.S. and Soviet strategies for conducting a protracted, nuclear-based conflict during the Cold War era. Under MAD, both superpowers kept their nuclear forces on high alert, ready to be launched at a moment's notice. The United States operated under the DEFCON system and also maintained a fleet of nuclear bombers along with ballistic-missile submarines, while their counterpart, the Soviet Union, did the same. Systems for rapid launch, secure command and control, and early warning became essential, but false alarms, as occurred in 1983 within the Soviet Union, showed the dangers of this. Over time, arms control agreements introduced verification and reduced operational readiness, modulating deterrence with risk reduction.

### Case Study on Operational Readiness: The Cuban Missile Crisis<sup>14</sup>

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<sup>13</sup>Theisen, Tiffini. "Defcon Levels." *Military.Com*, 24 Jan. 2023, [www.military.com/military-life/defcon-levels.html](http://www.military.com/military-life/defcon-levels.html) . Accessed 24 Sept. 2024.

"Nuclear Threats and Alerts: Looking at the Cold War Background." *Nuclear Threats and Alerts: Looking at the Cold War Background | Arms Control Association*, [www.armscontrol.org/act/2022-04/features/nuclear-threats-and-alerts-looking-cold-war-background](http://www.armscontrol.org/act/2022-04/features/nuclear-threats-and-alerts-looking-cold-war-background) . Accessed 24 Sept. 2024.

Theisen, Tiffini. "Defcon Levels." *Military.Com*, 24 Jan. 2023, [www.military.com/military-life/defcon-levels.html](http://www.military.com/military-life/defcon-levels.html) . Accessed 24 Sept. 2024.

<sup>14</sup> "The Cuban Missile Crisis, October 1962." *U.S. Department of State*, [history.state.gov/milestones/1961-1968/cuban-missile-crisis](http://history.state.gov/milestones/1961-1968/cuban-missile-crisis) . Accessed 24 Sept. 2024.

"Cuban Missile Crisis." *Encyclopædia Britannica*, Encyclopædia Britannica, Inc., 9 Sept. 2024, [www.britannica.com/event/Cuban-missile-crisis](http://www.britannica.com/event/Cuban-missile-crisis) . Accessed 24 Sept. 2024.

"1962 - Cuban Missile Crisis." *Air Force Historical Support Division*, [www.afhistory.af.mil/FAQs/Fact-Sheets/Article/458954/1962-cuban-missile-crisis/](http://www.afhistory.af.mil/FAQs/Fact-Sheets/Article/458954/1962-cuban-missile-crisis/) . Accessed 24 Sept. 2024.

The Cuban Missile Crisis, or the October 1962 crisis, remains one of the founding case studies in operational readiness and crisis management. John F. Kennedy and his advising group had to decide on what avenue of action to take once the Soviet missiles in Cuba were discovered but without igniting a nuclear war. Kennedy ordered a naval quarantine on the island and demanded the removal of the missiles, placing U.S. forces on higher alert, the highest level reached during the Cold War. The Soviet Union was also on high alert, and its forces were on standby to protect their missile emplacements. A mixture of public firmness and secret diplomacy defused this crisis by requiring the removal of missiles from Cuba in return for a U.S. promise not to invade. It underscored that only diplomacy, quick situational awareness, and communication could defuse a nuclear threat and pave the way for arms control agreements, as occurred with the 1963 Limited Test Ban Treaty.

### **Transition from Atomic Bomb (A) to Hydrogen Bomb (H)<sup>15</sup>**

The hydrogen bombs were a qualitative change in nuclear weapon technology, far more powerful than the atomic bomb. While the atomic bomb was based on fission, hydrogen bombs were based on fusion, increasing many times over the potential for destruction. This development accelerated the race in arms and underlined the necessity for credible deterrence. Thereafter, the introduction of the hydrogen bomb also boosted initiatives on arms control—for instance, the Partial Test Ban Treaty of 1963 and the Comprehensive Nuclear-Test-Ban Treaty—set up to reduce the risks of improved nuclear technology and prevent further proliferation of even more dangerous weapons.

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<sup>15</sup> Schumann, Anna. "Fact Sheet: Thermonuclear Weapons." *Center for Arms Control and Non-Proliferation*, 18 Nov. 2022, [armscontrolcenter.org/fact-sheet-thermonuclear-weapons/](https://armscontrolcenter.org/fact-sheet-thermonuclear-weapons/) . Accessed 24 Sept. 2024.

"The Physics of Nuclear Weapons." *Stanford.Edu* , [ee.stanford.edu/~hellman/sts152\\_02/handout02.pdf](https://ee.stanford.edu/~hellman/sts152_02/handout02.pdf) . Accessed 24 Sept. 2024.

### Developments Since the Cold War<sup>16</sup>

Afterwards, nuclear strategies varied with dramatic reductions in arsenals under treaties such as START I and New START. New nuclear threats, ranging from North Korea's nuclear weapons development program to the regional tensions in South Asia and the Middle East, became entwined with modernization programs in the U.S. and Russia to replace most delivery systems and refurbish warheads. Despite all the setbacks in arms control, efforts like the Comprehensive Nuclear-Test-Ban Treaty and NPT remain the most powerful impetus for worldwide non-proliferation efforts. The strategic doctrines have also changed their focus from general nuclear war to conventional threats and regional conflicts, indicative of a new period of nuclear politics.

### Current Operational Readiness

#### Actions Taken After NPT<sup>17</sup>

Multiple measures were taken for the reduction of nuclear arsenals and proliferation, after the NPT entered into force 1970. Included were arm control treaties, unilateral cuts and an enhanced mechanism that prevents proliferation. The most known treaties amongst them are the SALT, START and New START. These managed to quickly decrease the number of deployed nuclear warheads by the U.S. and Russia. Moreover, the CTBT established an international norm against nuclear testing and the INF Treaty from 1987 had eliminated an entire class of missiles.

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<sup>16</sup> "Status of World Nuclear Forces." *Federation of American Scientists*, 9 Sept. 2024, [fas.org/initiative/status-world-nuclear-forces/](https://fas.org/initiative/status-world-nuclear-forces/). Accessed 24 Sept. 2024.

"After the Cold War." *Encyclopædia Britannica*, Encyclopædia Britannica, Inc., [www.britannica.com/topic/nuclear-strategy/After-the-Cold-War](https://www.britannica.com/topic/nuclear-strategy/After-the-Cold-War). Accessed 24 Sept. 2024.

<sup>17</sup> "Timeline of the Nuclear Nonproliferation Treaty (NPT)." *Timeline of the Nuclear Nonproliferation Treaty (NPT) | Arms Control Association*, [www.armscontrol.org/factsheets/timeline-nuclear-nonproliferation-treaty-npt](https://www.armscontrol.org/factsheets/timeline-nuclear-nonproliferation-treaty-npt). Accessed 24 Sept. 2024.

"Safeguards to Prevent Nuclear Proliferation." *World Nuclear Association*, [world-nuclear.org/information-library/safety-and-security/non-proliferation/safeguards-to-prevent-nuclear-proliferation](https://www.world-nuclear.org/information-library/safety-and-security/non-proliferation/safeguards-to-prevent-nuclear-proliferation). Accessed 24 Sept. 2024.

*Nuclear Nonproliferation in US-Russian Relations - the Web ...*, [www.files.ethz.ch/isn/54962/nuclear%20nonproliferation.pdf](https://www.files.ethz.ch/isn/54962/nuclear%20nonproliferation.pdf). Accessed 24 Sept. 2024.

Unilateral reductions were of vital importance, in particular after the end of the Cold War. The U.S. and Russia retired older warheads and retired some delivery vehicles, while the 1991-1992 Presidential Nuclear Initiatives achieved deep cuts in non-strategic nuclear weapons. Also enhancing non-proliferation, the International Atomic Energy Agency's safeguards, tightened by additional protocols, and Nuclear-Weapon-Free Zones have been established.

### **Shrinking of Nuclear Arsenals<sup>18</sup>**

Most of these dramatic reductions to nuclear arsenals have been due to the arms control treaties stated above. For instance, New START limited both the U.S. and Russia to about 1,500 strategic warheads deployed on their delivery platforms. This reduction has been possible due to measures of transparency and verification—like inspections and data exchanges—which ensure compliance. The arsenal count went even further down with unilateral actions of warhead dismantlement and retirement of delivery platforms.

The post-Soviet context provides the most significant case study in disarmament. Indeed, after the Soviet Union collapsed in 1991, Russia was quick to secure and dismantle nuclear weapons in the newly independent states, particularly in Ukraine, Kazakhstan, and Belarus. Through the 1992 Lisbon Protocol and under U.S. assistance via the Cooperative Threat Reduction Program, these countries transferred all nuclear weapons to Russia and finally gained accession status to the NPT as non-nuclear states. For instance, Ukraine surrendered nearly 1,900 strategic warheads; Kazakhstan and Belarus did likewise and completed the entire process by the mid-1990s.

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<sup>18</sup> “The World’s Nuclear Arsenal Is Shrinking – but It’s Also Becoming More Advanced.” *World Economic Forum*, [www.weforum.org/agenda/2019/06/the-worlds-nuclear-arsenal-is-shrinking-but-its-also-getting-more-powerful/](http://www.weforum.org/agenda/2019/06/the-worlds-nuclear-arsenal-is-shrinking-but-its-also-getting-more-powerful/) . Accessed 24 Sept. 2024.

“Three Years on, How the TPNW Is Having Impact - ICAN.” *ICAN*, [www.icanw.org/three\\_years\\_on\\_how\\_the\\_tpnw\\_is\\_having\\_impact](http://www.icanw.org/three_years_on_how_the_tpnw_is_having_impact) . Accessed 24 Sept. 2024.

### Measures Taken<sup>19</sup>

Besides treaty-based reductions, cooperation at the international level and non-proliferation efforts have been of equal significance. The IAEA is the central body tasked with undertaking that NPT compliance has to be ascertained through inspections and monitoring. Nuclear-Weapon-Free Zones have been created over land, sea, and air spaces of various regions. The CTBT, not in force, has set a rigorous global norm against testing. The nuclear-sharing arrangements of NATO contribute to collective defense, and a number of European countries host U.S. nuclear weapons under quite stringent control. All such efforts put together ultimately lead to global nuclear security by reducing arsenals, strengthening norms of non-proliferation, and improving transparency and verification mechanisms.

### Case Study: The Contribution of Russia to the Dismantlement of Ex-Soviet Nuclear Arsenals<sup>20</sup>

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<sup>19</sup>“IAEA Safeguards Overview.” IAEA, 7 July 2014, [www.iaea.org/publications/factsheets/iaea-safeguards-overview](http://www.iaea.org/publications/factsheets/iaea-safeguards-overview) . Accessed 24 Sept. 2024.

*Arms Control and Nonproliferation: A Catalog of Treaties ...*, [sgp.fas.org/crs/nuke/RL33865.pdf](http://sgp.fas.org/crs/nuke/RL33865.pdf) . Accessed 24 Sept. 2024.

“The NPT and IAEA Safeguards.” IAEA, 22 Dec. 2021, [www.iaea.org/bulletin/the-npt-and-iaea-safeguards](http://www.iaea.org/bulletin/the-npt-and-iaea-safeguards) . Accessed 24 Sept. 2024.

Intern. “Analysis of the IAEA’s Iran NPT Safeguards Report - February 2024: Institute for Science and International Security.” *Analysis of the IAEA’s Iran NPT Safeguards Report - February 2024 | Institute for Science and International Security*, 4 Mar. 2024, [isis-online.org/isis-reports/detail/analysis-of-the-iaeas-iran-npt-safeguards-report-february-2024](http://isis-online.org/isis-reports/detail/analysis-of-the-iaeas-iran-npt-safeguards-report-february-2024) . Accessed 24 Sept. 2024.

<sup>20</sup> Andreis, Marco de, and Francesco Calogero. “The Soviet Nuclear Weapon Legacy.” *SIPRI*, 1 Jan. 1995, [www.sipri.org/publications/1995/soviet-nuclear-weapon-legacy](http://www.sipri.org/publications/1995/soviet-nuclear-weapon-legacy) . Accessed 24 Sept. 2024.

“U.S.-Russia Nuclear Arms Control.” *Council on Foreign Relations*, [www.cfr.org/timeline/us-russia-nuclear-arms-control](http://www.cfr.org/timeline/us-russia-nuclear-arms-control) . Accessed 24 Sept. 2024.

At the breakup of the Soviet Union, Ukraine, Kazakhstan, and Belarus based huge nuclear arsenals. Russia took the leading role in securing and dismantling these weapons with international backing. These countries were brought under the START I regime through the Lisbon Protocol signed in 1992. The Protocol called for them to join the NPT as non-nuclear states and to transfer all nuclear assets to Russia. Assisted by financial and technical assistance from the U.S., these efforts helped to ensure the safe removal and dismantlement of the weapons.

Ukraine started with the third-largest arsenal in the world but agreed to abandon its warheads in exchange for security guarantees and economic compensation. Ukraine transferred the last nuclear warhead stored on its land in 1996 and dismantled the missiles and the remaining silos in 2001. The other two republics in the country, Kazakhstan and Belarus, also finished the process of disarmament, thus setting a record of collaborative disarmament vis-à-vis international security.

### **Global Nuclear Landscape: Capable and Hosting States**

Countries with nuclear capability or hosting arrangements, like those of NATO, are very vital in global security. The U.S. and Russia have the largest arsenals, each with very different delivery systems which include intercontinental ballistic missiles and strategic bombers. NATO nuclear weapons sharing arrangements include countries like Germany, Belgium, and Italy hosting weapons of the U.S while participating in planning but remain under U.S. control. Other nuclear powers include China, the United Kingdom, France, India, Pakistan, and Israel, an undeclared nuclear power, with North Korea part of the global nuclear powers landscape.

### **The Alert Levels and Readiness**

The readiness and alert levels determine how quickly a nation can field nuclear forces in response to various threats. This ranges from routine peacetime readiness to maximum readiness, when conflict is either imminent or ongoing. Efficient management of these alert levels provides for a credible deterrent while minimizing the risks of escalation arising from misunderstandings.

### **Impact of Modern Technology on Operational Readiness**

Operational readiness of the nuclear force has been improved tremendously by modern technology. Advanced command and control systems provide for rapid, accurate communications in times of crisis; improved guidance systems and surveillance reduce the risk of surprise attack. In terms of the protection of nuclear systems, cybersecurity measures are increasingly important to ensure their integrity and prevent unauthorized access. Data analytics and simulation tools have taken an important place in strategic planning, where an enhanced ability to decide can be assured without having to detonate weapons. Although technology has strengthened nuclear readiness overall, it also introduces problems like cyber threats that have to be dealt with very carefully.

### **Challenges and Risks<sup>21</sup>**

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<sup>21</sup> “The Cyber-Nuclear Threat: Explained.” *The Nuclear Threat Initiative*, 31 Oct. 2022, [www.nti.org/analysis/articles/cyber/](http://www.nti.org/analysis/articles/cyber/). Accessed 24 Sept. 2024.

“The Dangers of Using Cyberattacks to Counter Nuclear Threats.” *The Dangers of Using Cyberattacks to Counter Nuclear Threats | Arms Control Association*, [www.armscontrol.org/act/2016-07/features/dangers-using-cyberattacks-counter-nuclear-threats](http://www.armscontrol.org/act/2016-07/features/dangers-using-cyberattacks-counter-nuclear-threats). Accessed 24 Sept. 2024.

“Cybersecurity of Nuclear Weapons Systems.” *Cathamhouse*, [www.chathamhouse.org/sites/default/files/publications/research/2018-01-11-cybersecurity-nuclear-weapons-unal-lewis-final.pdf](http://www.chathamhouse.org/sites/default/files/publications/research/2018-01-11-cybersecurity-nuclear-weapons-unal-lewis-final.pdf). Accessed 24 Sept. 2024.

One of the most dangerous risks is represented by the potential for accidental nuclear launches caused by just such high alertness. These can be provoked by technological malfunction, human error, cyber attacks, or miscommunication inside the command and control structures. History offers plenty of close calls as a reminder of this risk. For instance, in 1983, a Soviet satellite mistakenly detected a US missile attack that nearly spurred a retaliatory attack, which was defused by the judgment of the officer, Stanislav Petrov. In another incident, in 1962, the US radar system had incorrectly given an indication during the Cuban Missile Crisis that a Soviet missile was headed their way. It later became known it was a satellite. A mistaken launch might result in nuclear Armageddon, a full-scale atomic war, with millions of casualties and the environment damaged irreversibly. To avoid such a nightmare scenario, it is crucial that measures in very firm safety procedures should be implemented along with frequent system checks and ensuring tight security and safeguarding from unauthorized access. Moreover, such cooperation and transparency at an international level are also very necessary to eliminate misconceptions and to create an atmosphere of trust where mechanisms are in place to ensure that accidental or unintended threats are handled and deflated without delay.

There are major risks from cybersecurity threats to the integrity and safety of nuclear weapons systems. The risks come as they increasingly rely on digital technologies for communication, command, and control in the very way that exposes them to cyber attacks, in which operations are disrupted and sensitive information is stolen or even control systems are manipulated. For example, the 2010 Stuxnet infection is said to be created by the United States and Israel to hit the nuclear installations of Iran in order to develop the capability of cyber weapons to cause physical damage too. Another example is the breach of the Democratic National Committee that happened in 2016; this clearly shows that even well-developed systems are prone to attacks that may result in unwanted launches, sabotage, or false alarms that could trigger unintentional military actions. These dangers are heightened due to the advanced and ever-improving nature of methods that malicious actors use in their executions—mainly state-sponsored hackers and terrorist groups. The mitigation efforts against these risks, therefore, depend on laying appropriate cybersecurity measures to that end, including the adoption of advanced encryption, continuous monitoring, and regular vulnerability assessments. Besides, international cooperation will require the invention of norms and frames for nuclear cybersecurity to make sure of the collective outlook toward the safeguarding of such critical systems from cyber-threats.

The chances of a large-scale operational readiness of nuclear weapons systems are linked directly to regional conflicts and international rivalries. States which are engaged in regional conflicts or involved in strategic rivalry are likely to believe that they need immediate deterrents. This is driven by the fear of an adversary taking advantage of any sign of weakness. For example, India and Pakistan have been training guns at each other in a fashion that one feels tension fomenting to the maximum at any time. Both the nations are on red alert at this juncture. Similarly, even during the Cold War period, the rivalry between the United States and Russia kept on throwing them into a nuclear arms race wherein they kept their arsenal on high alert. These dynamics, on their part, force states to have their nuclear systems up and running all the time, supporting them with effective command and control mechanisms. They consider this high degree of readiness an essential option to deter an attack by an opponent, reassure allies of the capability to respond, and project power. However, this puts them permanently on a high alert, thereby increasing the danger of nuclear catastrophe, mistakenly launched and precluding global disarmament efforts as a result of continuing a zero-sum cycle of mutual suspicion and arms buildup.

## MAJOR COUNTRIES AND ORGANIZATIONS INVOLVED

### United States<sup>22</sup>

The U.S. is a country that has a significant role in nuclear stability globally, because of its advanced delivery systems, arsenal and continuous modernization programs. Some steps that have been taken to reduce operational readiness include, the de-alerting of some nuclear forces and complying to key arms control agreements like the New START Treaty. The shaping of the U.S. policy influenced by the Nuclear Posture Review and obligations to the Non-Proliferation Treaty is well reflected in the balance stated between the credible

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<sup>22</sup> Office, U.S. Government Accountability. "U.S. Military Working to Rebuild Readiness and Modernize." *U.S. GAO*, 16 July 2024, [www.gao.gov/blog/u.s.-military-working-rebuild-readiness-and-modernize](http://www.gao.gov/blog/u.s.-military-working-rebuild-readiness-and-modernize) . Accessed 24 Sept. 2024.

"Department of Defense Fact Sheet: Sequestration's Impact to Regaining Readiness." *DOD Readiness Fact Sheet Final* , [dod.defense.gov/Portals/1/Documents/pubs/DoD\\_Readiness\\_Fact\\_Sheet\\_FINAL.pdf](http://dod.defense.gov/Portals/1/Documents/pubs/DoD_Readiness_Fact_Sheet_FINAL.pdf) . Accessed 24 Sept. 2024.

A graduate of the U. S. Naval Academy with the Class of 1945. "Operational Readiness and Military Requirements." *U.S. Naval Institute*, 9 Jan. 2024, [www.usni.org/magazines/proceedings/1964/july/operational-readiness-and-military-requirements](http://www.usni.org/magazines/proceedings/1964/july/operational-readiness-and-military-requirements) . Accessed 24 Sept. 2024.

deterrent and the advancement of disarmament goals. Further, owing to the large inventory and its influence on global security issues, the U.S. is obliged to ensure that its systems are reliable and safe while addressing concerns regarding safety. Reduction of readiness levels, in view of technological advancement and geopolitical change, continues to be debated by both domestic and international pressures. The need for responsible nuclear stewardship is underlined as a dire necessity. What the operational readiness posture now is in the U.S. will be seminal in defining future arms control agreements and global non-proliferation efforts.

### Russia<sup>23</sup>

Discussion on the reduction of operational readiness of nuclear weapons could not be well achieved without engaging Russia due to its vast nuclear arsenal, strategic interests, and geopolitical influence. Being one of the largest powers in nuclear energy, it remains critical in the aspect of readiness posture for national security and stability globally. Indeed, Russia has been making steps toward reducing readiness, especially under the New START Treaty, which limits deployed nuclear warheads and their delivery systems. Pressures from both domestic and international actors on matters of nuclear safety, security, and arms control, put amidst rapid technological changes and emerging strategic threats, have kept the need for reassessment and adjustment of Russia's nuclear posture constant. The balancing between deterrence and global security commitments locates Russia in a pivotal position vis-à-vis the shaping of future arms control and non-proliferation efforts.

### China<sup>24</sup>

As China continues to expand its nuclear arsenal and strategic ambitions, its relevance for discussions on nuclear operational readiness will only continue to grow. While

<sup>23</sup> "Russia Suspends New Start." *Russia Suspends New START | Arms Control Association*, [www.armscontrol.org/act/2023-03/news/russia-suspends-new-start](http://www.armscontrol.org/act/2023-03/news/russia-suspends-new-start) . Accessed 24 Sept. 2024.

"New START Treaty." *The Nuclear Threat Initiative*, 9 Apr. 2024, [www.nti.org/education-center/treaties-and-regimes/treaty-between-the-united-states-of-america-and-the-russian-federation-on-measures-for-the-further-reduction-and-limitation-of-strategic-offensive-arms/](http://www.nti.org/education-center/treaties-and-regimes/treaty-between-the-united-states-of-america-and-the-russian-federation-on-measures-for-the-further-reduction-and-limitation-of-strategic-offensive-arms/) . Accessed 24 Sept. 2024.

<sup>24</sup> Murphy, Matt. "China Has Sharply Expanded Nuclear Arsenal, US Says." *BBC News*, BBC, 20 Oct. 2023, [www.bbc.com/news/world-us-canada-67163903](http://www.bbc.com/news/world-us-canada-67163903) . Accessed 24 Sept. 2024.

Nagorski, Tom. "Understanding China's Growing Nuclear Arsenal." *The Cipher Brief*, 30 May 2024, [www.thecipherbrief.com/chinas-nuclear-weapons](http://www.thecipherbrief.com/chinas-nuclear-weapons) . Accessed 24 Sept. 2024.

the number of warheads is growing, albeit from a smaller base compared with those of the United States and Russia, its strategy focuses on how best to ensure deterrence with a modernizing force—a process in which new technologies are being heavily invested.

China maintains a relatively low level of operational readiness with a "no first use" policy and does not maintain its weapons on high alert status. Though China has not signed any agreements like the New START, it participates in international arms control discourse through confidence-building measures in multilateral fora such as the United Nations Conference on Disarmament and the P5 Process. The pressure against formal agreements that would imply constraint on its smaller arsenal is very strong. There is increasing pressure on China to be more transparent as it modernizes.

In this respect, the operational readiness of China is dictated by its strategic objectives and regional security concerns. It will be of utmost importance and pivotal for the stability of the world in any arms control talk in the future. Its balancing between deterrence with international engagement will be vital in shaping global arms control efforts.

## **India<sup>25</sup>**

Strategic priorities and regional concerns about the security of India billet its approach toward nuclear weapons and operational readiness. Compared to major powers like the United States, Russia, and China, the arsenal is quite small, and its "no first use" policy underlines a retaliatory stance. Having this policy at its core, India is therefore interested in ensuring credible deterrence while managing risks.

Upgrading its delivery systems and command infrastructure, India is making sure to get more reliability and effectiveness in its nuclear forces. It is not a signatory to the NPT, yet it engages in the debate at global forums on issues related to nuclear stability and arms control. Its status on readiness brings fine balance into strategic deterrence with concerns of global security.

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<sup>25</sup> "Twenty-Five Years of Overt Nuclear India." *Twenty-Five Years of Overt Nuclear India | Arms Control Association*, [www.armscontrol.org/act/2023-10/features/twenty-five-years-overt-nuclear-india](http://www.armscontrol.org/act/2023-10/features/twenty-five-years-overt-nuclear-india) . Accessed 24 Sept. 2024.

## Pakistan<sup>26</sup>

Strategic concerns and regional security dynamics shape Pakistan's approach toward nuclear weapons and operational readiness. Having in view the neutralization of India's bigger nuclear arsenal, Pakistan has developed its own significant, though small, nuclear capability. Its strategy is premised upon ensuring a credible deterrent for national security. Furthermore, Pakistan's nuclear policy includes a no-first-use stance. Its overall posture also presents the need to handle the perceived threats that exist due to its neighboring country. The country is working on the modernization of its nuclear forces by focusing on developing new delivery systems and improving command and control infrastructure. At the international level of arms control, Pakistan is a non-signatory to the Nuclear Non-Proliferation Treaty and reportedly insists on security concerns in global deliberations. Operational readiness is pursued at a level that deters effectively while striking a balance between regional stability and strategic needs.

## North Korea<sup>27</sup>

The main motivation for developing nuclear weapons and maintaining operational readiness lies at the core of regime security and international leverage. Being under severe pressure from international sanctions and constant political pressure, Pyongyang has managed to field a considerable nuclear arsenal. Its nuclear strategy places an emphasis on deterrence against perceived threats.

North Korea's nuclear posture keeps a ready arsenal it can deploy at any moment. Testing of new weapons and delivery systems is held continuously, as evidenced by what is being done so far. The country is working to get these nuclear forces in effective order so

<sup>26</sup>“Pakistan’s Nuclear Strategy.” *Pakistan’s Nuclear Strategy*, [ciaotest.cc.columbia.edu/olj/sa/sa\\_jan03pas01.html](http://ciaotest.cc.columbia.edu/olj/sa/sa_jan03pas01.html) . Accessed 24 Sept. 2024.

“Pakistan’s Evolving Nuclear Doctrine.” *Pakistan’s Evolving Nuclear Doctrine | Arms Control Association*, [www.armscontrol.org/act/2023-10/features/pakistans-evolving-nuclear-doctrine](http://www.armscontrol.org/act/2023-10/features/pakistans-evolving-nuclear-doctrine) . Accessed 24 Sept. 2024.

<sup>27</sup> “Nuclear for Nuclear? Understanding Divergent South Korean and American Perceptions on Deterring North Korea - Carnegie Endowment for International Peace | Carnegie Endowment for International Peace.” *Carnegieendowment*, [carnegieendowment.org/research/2024/06/nuclear-for-nuclear-understanding-divergent-south-korea-and-american-perceptions-on-deterring-north-korea](http://carnegieendowment.org/research/2024/06/nuclear-for-nuclear-understanding-divergent-south-korea-and-american-perceptions-on-deterring-north-korea) . Accessed 24 Sept. 2024.

“North Korea Policy & Extended Deterrence .” *North Korea Policy & Extended Deterrence*, 19 Jan. 2023, [features.csis.org/north-korea-extended-deterrence/](http://features.csis.org/north-korea-extended-deterrence/) . Accessed 24 Sept. 2024.

that they can be used if necessary; all this is part of a greater strategy toward regime survival and negotiating leverage.

This internationally puts a damper on efforts to control arms. North Korea has never followed the international standards of non-proliferation, frequently resorting to the use of nuclear capability as a bargaining chip in diplomatic interaction. Its approach to the operational readiness of forces has to do with maintaining and presenting credible deterrence amidst continuous international sanctions and isolation.

### **UN Office for Disarmament Affairs (UNODA)<sup>28</sup>**

The United Nations Office of Disarmament Affairs acts as the foundation stone through which disarmament and non-proliferation at the global level are pursued. The three key aims of this body include the promotion of various policies of disarmament, arms control agreements, and international cooperation that works for reducing weapons of mass destruction. UNODA promotes disarmament agendas, assists member states in implementing and complying with foremost treaties like the Nuclear Non-Proliferation Treaty, Chemical Weapons Convention, and Biological Weapons Convention, and it supports negotiations on new agreements. In essence, it is involved in research and analysis of arms control concerns. It helps countries to build capacity to handle commitments on disarmament, hence making dialogue easier among states, international organizations, and civil society. Such efforts bring UNODA closer to its goal of increased global security and stability through non-proliferation efforts against WMD risks.

### **International Atomic Energy Agency (IAEA)<sup>29</sup>**

The International Atomic Energy Agency is an important body both for the promotion of atomic energy for peaceful use and for assurance of the prevention of

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<sup>28</sup> "Spotlight." *United Nations Office for Disarmament Affairs*, <https://disarmament.unoda.org/> . Accessed 24 Sept. 2024.

<sup>29</sup> "Basics of IAEA Safeguards." *IAEA*, 8 June 2016, [www.iaea.org/topics/basics-of-iaea-safeguards](http://www.iaea.org/topics/basics-of-iaea-safeguards) . Accessed 24 Sept. 2024.

diversion to weapons uses. Starting operations in 1957, the IAEA is directly responsible for safeguard measures—inspections to ensure that nuclear facilities and materials are used solely for peaceful purposes. It establishes worldwide standards in nuclear safety and security, provides guidance for assistance in accident prevention and cases of misuse. The Agency supports the transfer of nuclear technology for applications in energy, medicine, and agriculture, and brings assistance to research and innovation in nuclear science. It provides support to emergency response in relation to incidents with nuclear material and assistance in radioactive emergencies management. These efforts made the IAEA truly outstanding for global nuclear safety, security, and nonproliferation.

## TIMELINE OF EVENTS

Date	Description of Event
1950s	As a component of deterrent tactics, the US and Soviet nuclear arsenals are declared highly operationally ready. <sup>30</sup>
October 1962	The hazards of high readiness and quick escalation to nuclear conflict are shown by the Cuban Missile Crisis. <sup>31</sup>
July 31, 1991	The US and the Soviet Union agreed to lower the number of strategically placed nuclear weapons when they signed the Strategic Arms Reduction Treaty (START I). <sup>32</sup>

<sup>30</sup>“Deterrence.” *Encyclopædia Britannica*, Encyclopædia Britannica, Inc., [www.britannica.com/topic/deterrence-political-and-military-strategy](http://www.britannica.com/topic/deterrence-political-and-military-strategy) . Accessed 19 Sept. 2024.

<sup>31</sup>“The Cuban Missile Crisis, October 1962.” *U.S. Department of State*, [history.state.gov/milestones/1961-1968/cuban-missile-crisis](http://history.state.gov/milestones/1961-1968/cuban-missile-crisis) . Accessed 19 Sept. 2024.

<sup>32</sup> *Start I*, [1997-2001.state.gov/global/arms/factsheets/wmd/nuclear/start1/starteif.html](http://1997-2001.state.gov/global/arms/factsheets/wmd/nuclear/start1/starteif.html) . Accessed 19 Sept. 2024.

September 27, 1991	President George H.W. Bush of the United States announces unilateral reductions in tactical nuclear weapons and adjustments to the alert level in his Presidential Nuclear Initiatives (PNIs). <sup>33</sup>
October 5, 1991	Mikhail Gorbachev, the president of the Soviet Union, responds with comparable measures. <sup>34</sup>
December 5, 1994	START I enters into force <sup>35</sup>
September 24, 1996	CTBT opened for signature, aiming to ban all nuclear explosions for both civilian and military purposes. <sup>36</sup>
24 April to 19 May 2000	NPT Review Conference: States possessing nuclear weapons pledge to take additional measures to lessen the influence of nuclear weapons in security strategies. <sup>37</sup>
April 8, 2010	The US and Russia signed the New START Treaty, which significantly reduced the number of strategic nuclear weapons and launchers in use. <sup>38</sup>

<sup>33</sup> “The Presidential Nuclear Initiatives of 1991–1992.” *PDF.js Viewer*, [nsarchive.gwu.edu/themes/custom/nsarchive/templates/pdfjs/web/viewer.html?file=https%3A%2F%2Fnsarchive.gwu.edu%2Fsites%2Fdefault%2Ffiles%2Fdocuments%2F3983243%2FDocument-22.pdf](https://nsarchive.gwu.edu/themes/custom/nsarchive/templates/pdfjs/web/viewer.html?file=https%3A%2F%2Fnsarchive.gwu.edu%2Fsites%2Fdefault%2Ffiles%2Fdocuments%2F3983243%2FDocument-22.pdf) . Accessed 19 Sept. 2024.

<sup>34</sup> “Unilateral U.S. Nuclear Pullback in 1991 Matched by Rapid Soviet Cuts.” *National Security Archive*, 27 Sept. 1991, [nsarchive.gwu.edu/briefing-book/nuclear-vault-russia-programs/2016-09-30/unilateral-us-nuclear-pullback-1991-matched](https://nsarchive.gwu.edu/briefing-book/nuclear-vault-russia-programs/2016-09-30/unilateral-us-nuclear-pullback-1991-matched) . Accessed 19 Sept. 2024.

<sup>35</sup> “Start I at a Glance.” *START I at a Glance | Arms Control Association*, [www.armscontrol.org/factsheets/start-i-glance](http://www.armscontrol.org/factsheets/start-i-glance) . Accessed 19 Sept. 2024.

<sup>36</sup> “Nuclear Testing and Comprehensive Test Ban Treaty (CTBT) Timeline.” *Nuclear Testing and Comprehensive Test Ban Treaty (CTBT) Timeline | Arms Control Association*, [www.armscontrol.org/factsheets/nuclear-testing-and-comprehensive-test-ban-treaty-ctbt-timeline](http://www.armscontrol.org/factsheets/nuclear-testing-and-comprehensive-test-ban-treaty-ctbt-timeline) . Accessed 19 Sept. 2024.

<sup>37</sup> “NPT Review Conferences.” *IAEA*, 11 July 2014, [www.iaea.org/topics/npt-review-conferences](http://www.iaea.org/topics/npt-review-conferences) . Accessed 19 Sept. 2024.

<sup>38</sup> “U.S.-Russian Nuclear Arms Control Agreements at a Glance.” *U.S.-Russian Nuclear Arms Control Agreements at a Glance | Arms Control Association*, [www.armscontrol.org/factsheets/us-russian-nuclear-arms-control-agreements-glance](http://www.armscontrol.org/factsheets/us-russian-nuclear-arms-control-agreements-glance) . Accessed 19 Sept. 2024.

October 2, 2013	The UN General Assembly adopts a resolution that negotiates banning nuclear weapons <sup>39</sup>
July 7, 2017	The United Nations adopted the Treaty on the Prohibition of Nuclear Weapons (TPNW), which seeks to entirely eliminate nuclear weapons. <sup>40</sup>

## UN INVOLVEMENT: RELEVANT RESOLUTIONS, TREATIES AND EVENTS

### UN General Assembly Resolution 65/71<sup>41</sup>

The UN General Assembly Resolution 65/71 is clearly entitled "Reducing Nuclear Threat" for reducing the readiness level of nuclear weapons with a view to decreasing the risk of accidental or unauthorized launches and supporting global efforts on nuclear disarmament. Adopted on 8 December 2010, the resolution especially urges states with nuclear capability to reduce the alert status of their nuclear arsenals.

It is supposed to reduce this risk of a nuclear exchange through miscalculation, technical error, or hurry in times of crisis. This resolution further supports broader efforts to move toward nuclear disarmament by encouraging steps that slow down the decision-making process for deploying nuclear weapons to contribute toward international peace and security.

The resolution thus comes very close to existing and ongoing initiatives of disarmament, specifically directed at reducing the risks from keeping nuclear weapons on high-alert status.

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<sup>39</sup>"Treaty on the Prohibition of Nuclear Weapons." *United Nations Office for Disarmament Affairs*, [disarmament.unoda.org/wmd/nuclear/tpnw/](https://disarmament.unoda.org/wmd/nuclear/tpnw/) . Accessed 19 Sept. 2024.

<sup>40</sup>"UN, United Nations, UN Treaties, Treaties." *United Nations*, [treaties.un.org/pages/ViewDetails.aspx?src=TREATY&mtdsg\\_no=XXVI-9&chapter=26](https://treaties.un.org/pages/ViewDetails.aspx?src=TREATY&mtdsg_no=XXVI-9&chapter=26) . Accessed 19 Sept. 2024.

<sup>41</sup> "65/71. Decreasing the Operational Readiness of Nuclear Weapons Systems." *UN iLibrary*, United Nations, [www.un-ilibrary.org/content/books/9789210544177s003-c033/read](https://www.un-ilibrary.org/content/books/9789210544177s003-c033/read) . Accessed 24 Sept. 2024.

### **UN General Assembly Resolution 75/72<sup>42</sup>**

The UN General Assembly Resolution 75/72, entitled "Decreasing the Operational Readiness of Nuclear Weapon Systems," was adopted on 7 December 2020. It addresses, in this context, the global concern about reducing the risk from an accidental or unauthorized use of nuclear weapons by reducing operational readiness. The resolution urges nuclear-weapon states to take concrete steps and measures to reduce the alert status of nuclear-weapon systems, substantially diminishing the risk of rapid escalation through miscalculation or miscommunication.

The resolution encourages a process of openness and dialogue among the states with respect to their nuclear postures, and it is in favor of reducing the readiness of nuclear arsenals as a step toward disarmament and international security. This resolution aims at decreasing the operational readiness of atomic weapons to enhance strategic stability and reduce the risks of nuclear conflict.

### **The Treaty on the Prohibition of Nuclear Weapons (TPNW)<sup>43</sup>**

TPNW in its entirety reflects the theme of reducing operational readiness of nuclear weapons, as it seeks to abolish nuclear weapons in their entirety. TPNW was adopted in 2017 and it bans the development, stockpiling, and use of nuclear weapons. The entire effort addresses the risks associated with nuclear weapons deployment.

Whereas the TPNW is oriented to complete nuclear disarmament, it also supplements measures like UNGA Resolution 65/71, which is one-step oriented toward the reduction of high-alert nuclear systems by insisting on lower operational readiness. Both are thus modeled to reduce nuclear risks and engender collective security.

### **Nuclear-Test-Ban Treaty (CTBT)**

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<sup>42</sup> "75/72 Decreasing the Operational Readiness of Nuclear Weapons Systems." *UN iLibrary*, United Nations, [www.un-ilibrary.org/content/books/9789210056700c045/read](http://www.un-ilibrary.org/content/books/9789210056700c045/read) . Accessed 19 Sept. 2024.

<sup>43</sup> "Treaty on the Prohibition of Nuclear Weapons (TPNW)." *The Nuclear Threat Initiative*, 8 July 2024, [www.nti.org/education-center/treaties-and-regimes/treaty-on-the-prohibition-of-nuclear-weapons/](http://www.nti.org/education-center/treaties-and-regimes/treaty-on-the-prohibition-of-nuclear-weapons/) . Accessed 24 Sept. 2024.

"Treaty on the Prohibition of Nuclear Weapons." *United Nations Office for Disarmament Affairs*, [disarmament.unoda.org/wmd/nuclear/tpnw/](http://disarmament.unoda.org/wmd/nuclear/tpnw/) . Accessed 24 Sept. 2024.

The Comprehensive Nuclear-Test-Ban Treaty is the international agreement that forbids any nuclear explosion, whatever be its orientation—military or civilian in nature. The CTBT was adopted by the United Nations General Assembly in the year 1996, which aims at preventing the development of nuclear weapons and to stop the proliferation of nuclear technology. Although signed by many, this treaty has not yet come into effect because some very important states—the United States, China, and India—have not ratified it.

The CTBT is related to reducing operational readiness because, by prohibiting tests, it inhibits the development and modernization of nuclear arsenals, hence contributing to the goals of disarmament, and diminishes the risks related to these kinds of weapons.

### **Nuclear Non-Proliferation Treaty (NPT)<sup>44</sup>**

The NPT is viewed as a very basic international agreement that strives to prevent the spread of nuclear weapons, promote disarmament, and assist the peaceful application of nuclear energy. Opened for signature in 1968, and in force since 1970, the three principal objectives of this treaty are to prevent the spread of nuclear weapons by prohibiting non nuclear-weapon states from manufacturing them or acquiring them; to promote nuclear-weapon states toward disarmament, with the ultimate goal of reduction of arsenals; and to promote peaceful applications of nuclear energy, including providing assurances that nuclear technology and materials are used only for civilian purposes under international safeguards. The treaty is monitored by the International Atomic Energy Agency, which makes inspections to ensure compliance. In order to review the progress and failures, review conferences are held every five years. Despite ongoing problems with disarmament and non-proliferation, the NPT is one of the cornerstones of global efforts at managing nuclear risks to international stability.

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<sup>44</sup> "NPT Review Conferences." IAEA, 11 July 2014, [www.iaea.org/topics/npt-review-conferences](http://www.iaea.org/topics/npt-review-conferences) . Accessed 24 Sept. 2024.

Bencini, Leonardo, et al. "Reflections on Review Conferences: The Non-Proliferation Treaty, the Biological Weapons Convention and the Chemical Weapons Convention → Unidir." *UNIDIR*, 18 Mar. 2024, [unidir.org/publication/reflections-on-review-conferences-the-non-proliferation-treaty-the-biological-weapons-convention-and-the-chemical-weapons-convention/](http://unidir.org/publication/reflections-on-review-conferences-the-non-proliferation-treaty-the-biological-weapons-convention-and-the-chemical-weapons-convention/) . Accessed 24 Sept. 2024.

## PREVIOUS ATTEMPTS TO SOLVE THE ISSUE

### Strategic Arms Reduction Treaty (START I)

The Strategic Arms Reduction Treaty, START I, was signed on July 31, 1991, between the United States and the former Soviet Union for the purpose of reducing nuclear weapons and lowering the operational readiness of these weapons. The accord limited both parties to the maximum ceiling of 6,000 deployed strategic nuclear warheads and 1,600 delivery vehicles, such as ICBMs, SLBMs, and heavy bombers. It reduced the risk of accidental and unauthorized launch, and slowed the pace of nuclear armaments development by promoting a reduction in the number of weapons and their delivery systems on high alert. These verification measures made it possible for compliance and brought the two countries closer to mutual trust in the sphere of global security and stability.

### New START Treaty

The New START Treaty is a United States–Russia agreement, signed April 8, 2010, that controls arms and further reductions, with limits on the number of deployed strategic nuclear warheads and their delivery systems. Under this treaty, each country has agreed to cap 1,550 for the number of nuclear warheads deployed that it would carry and to limit its deployed delivery vehicles—ICBMs, SLBMs, and bombers—to 700. Verification mechanisms, including on-site inspections and data exchanges, are also established in an adequate manner by this treaty to monitor compliance. The reduction in the numbers of nuclear weapons deployed on both sides, and increased transparency, under the New START Treaty lowered further the readiness of operational nuclear arsenals and hence supported global stability and security.

### US Presidential Nuclear Initiatives (PNIs)<sup>45</sup>

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<sup>45</sup> “Unilateral U.S. Nuclear Pullback in 1991 Matched by Rapid Soviet Cuts.” *National Security Archive*, 27 Sept. 1991, [nsarchive.gwu.edu/briefing-book/nuclear-vault-russia-programs/2016-09-30/unilateral-us-nuclear-pullback-1991-matched](https://nsarchive.gwu.edu/briefing-book/nuclear-vault-russia-programs/2016-09-30/unilateral-us-nuclear-pullback-1991-matched) . Accessed 24 Sept. 2024.

The U.S. Presidential Nuclear Initiatives, announced in 1991 by President George H.W. Bush, comprised a range of unilateral steps aimed at reducing operational readiness of nuclear weapons systems. They were nearly countless: the withdrawal of thousands of tactical nuclear weapons from Europe and Asia, de-alerting strategic bombers by standing them down from 24-hour alert status, and dismantling ground-launched tactical nuclear missiles. The PNIs were important in that they were unilateral, non-legally binding actions that rapidly reduced nuclear escalation risk by reducing nuclear weapons readiness and availability, all without protracted negotiation. It was a way to generate trust and stabilize relations with the Soviet Union during times of crisis at the tail end of the Cold War.

### **Russian De-alerting Initiatives<sup>46</sup>**

The Russian De-alerting Initiatives refer to a set of Russian measures introduced in the early 1990s to stand down the operational readiness of its nuclear weapons, parallel to the U.S. Presidential Nuclear Initiatives. Following the dissolution of the Soviet Union, Russia, under the leadership of President Boris Yeltsin, initiated steps toward defusing the nuclear confrontation by standing down some nuclear forces from high alert. Deactivating strategic bombers, removing and destroying tactical nuclear weapons, and decreasing the readiness of some land- and sea-based nuclear missiles were the methods used to accomplish this. These were a few of the more extensive measures used to improve security by reducing the likelihood of accidental or inadvertent launches and decrease the threat of nuclear war. They also signaled a change in Russia's nuclear policy, which called for more responsible and cautious management of the country's nuclear weapons amid a period of dramatic political and economic turmoil.

### **Comprehensive Nuclear-Test-Ban Treaty (CTBT)**

The Comprehensive Nuclear-Test-Ban Treaty, which opened for signature in 1996, aims to prohibit nuclear explosions for military or civilian purposes. This implies refraining from developing and enhancing nuclear weapons. Verification is to be conducted at the global level. Although it was signed by 187 countries, as of date, the CTBT is not in force, pending ratification by all the 44 states known to possess nuclear capabilities. Though far

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<sup>46</sup> *The Presidential Nuclear Initiatives of 1991–1992*, [ndupress.ndu.edu/Portals/68/Documents/casestudies/CSWMD\\_CaseStudy-5.pdf](https://ndupress.ndu.edu/Portals/68/Documents/casestudies/CSWMD_CaseStudy-5.pdf) . Accessed 24 Sept. 2024.

from perfect, the CTBT has helped underpin an international norm against nuclear testing and contributed to the process of global disarmament and the reduction of nuclear risks.

### **EU Strategy Against the Proliferation of Weapons of Mass Destruction (WMD)**

The EU Strategy Against the Proliferation of WMDs, put into operation in 2003, is a multidimensional approach developed to counter the proliferation of weapons of mass destruction. These policies emphasize strengthening international treaties, improving export controls, and offering support for numerous programs in the sphere of disarmament. It thereby continues to reinforce the role of diplomacy, multilateralism, and cooperation with international organizations in addressing such threats from WMD proliferation. The long-term strategy is thus aimed at enhancing global security, avoiding risk situations that occur from WMD technologies, and finally contributing towards peace and stability at the international level.

### **NATO's Policy of No First Use Policy (NFU)**

The NFU policy means that NATO has pledged itself not to be the first to make a nuclear attack. It therefore follows that the Alliance will use nuclear weapons only in the face of a nuclear attack or when a conventional or hybrid threat presents a danger to the Alliance's capacity to continue as a member. Making the language of use of nuclear weapons limited to defense and deterrence, the doctrine reduces the risks of nuclear escalation. Under the Alliance strategic doctrine, resorting to nuclear weapons is only a last resort. Although NATO has not issued or declared an NFU policy to this day, it is necessary for effective deterrence against enemies, while reassuring allies that they are safe.

## **POSSIBLE SOLUTIONS**

### **Immediate De-alerting of All Nuclear Weapons**

One of the ways of reducing the risks of having nuclear weapons on high alert is to stand them down immediately. In view of the fact that deterrence becomes quite risky when urgency times are fast instabilities in the danger of accidental, unauthorized, or rapid launch, many arsenals are kept ready to launch within minutes of being informed. Steps can be as drastic as the removal of warheads from delivery systems, disabling launch systems, or the

introduction of technical delays that would make the launch process take longer. Such steps would reduce decision pressure during crises, reduce the chance of false launches, and reduce mutual mistrust that nuclear states currently have by generating trust toward each other's intentions to reduce the role of nuclear weapons. Effective de-alerting measures will involve the physical separation of warheads and missiles or bombers, adding extra levels of authorization to delay such a launch, and canceling automated "launch on warning" systems to ensure all launch decisions are based on human judgment and a careful mix of reassessment.

### **Increase of transparency regarding nuclear arsenals and policies**

More transparency on nuclear arsenals and policies makes for less tension among nuclear states. Entailed information sharing in this aspect includes the size and composition of the stockpile, as well as the doctrines that regulate its use. Transparency reassures other countries that nuclear capabilities have deterrence purposes rather than offensive attacks. Secondly, it strengthens arms control treaties with verifiable data and diminishes the risks of arms races because secrecy will not feed an arms race. For instance, the New START between the United States and Russia is based on data exchange and on-site inspections that ensure monitoring of compliance in order to maintain stability.

Periodic exchange of information, inspection, and public releases of nuclear policy enhance states' transparency. These measures engender confidence, promote dialogue, and lead to efforts in global security.

### **Upgrade command and control systems to enhance security and reliability<sup>47</sup>**

Upgrading of the command and control system would ensure atomic weapons are managed in a safe, secure manner and that instances of accidental deployment can be avoided. Such upgrades need to focus on improving current nuclear infrastructure to

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<sup>47</sup> "How Artificial Intelligence Will Change Information and Computer Security in the Nuclear World." IAEA, 23 June 2023, [www.iaea.org/bulletin/how-artificial-intelligence-will-change-information-and-computer-security-in-the-nuclear-world](http://www.iaea.org/bulletin/how-artificial-intelligence-will-change-information-and-computer-security-in-the-nuclear-world) . Accessed 24 Sept. 2024.

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increase safety standards, and investing in modern cybersecurity systems to achieve strong encryption, multi-factor authentication, and continuous monitoring. The incorporation of AI and machine learning tools will help improve the capabilities for threat detection. At the same time, this shall be complimented by the training of personnel on how to work effectively under stressful conditions. Routine drills and simulations in preparation for technical failures, unauthorized access, and other emergencies ensure the staff are well braced when actual events strike. In addition, comprehensive upgrade of security systems would further enhance protection for nuclear arsenals, making them credible and safe deterrents underpinning stability around the world.

**Reduction of the number of nuclear weapons to a minimum necessary for deterrence<sup>48</sup>**

A minimal deterrence strategy requires few weapons and can help improve global security by reducing large arsenal risks. Even in a limited nuclear response, damages would be unacceptable, so large stockpiling is not necessary. It reduces the risks of accidental launches and unauthorized use, together with the financial and environmental costs associated with their maintenance. They reduce proliferation risks by smaller arsenals and avoid the risk that nuclear weapons could fall into the wrong hands.

As such, it is an unmistakable undertaking of disarmament squarely falling within treaties such as the Non-Proliferation Treaty. States can achieve minimal deterrence through arms reduction agreements and retirement of outdated weapons while maintaining a no-first-use stance to have credible deterrence for global stability.

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