CENTER FOR GLOBAL SECURITY RESEARCH

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Nuclear Order and Global Disorder

Workshop Summary

July 22-23, 2025

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Center for Global Security Research
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On July 22-23, the Center for Global Security Research (CGSR) at Lawrence Livermore National Laboratory (LLNL) hosted a workshop titled "Nuclear Order and Global Disorder." This session brought together participants drawn across the policy, military, and technical communities.

The discussion was guided by the following key questions:

- What are the constituent elements of the international nuclear order?
- How have they been affected by growing disagreement about the international political order?
- What can be done to safeguard the nuclear order and to promote its continued peaceful evolution?
- What must be done to hedge against its catastrophic collapse, including via nuclear use?

Key takeaways:

1. The international nuclear order is largely a U.S. creation, designed to safeguard broad international interests (in reaping the peaceful benefits of nuclear energy and escaping the potential catastrophe of nuclear war) while also advancing the self-interests of the United States. Those interests include the avoidance of nuclear wars, both major and minor, positive control of highly sensitive materials and technologies, the peaceful application of those materials and technologies, and the prevention of nuclear terrorism. Today, this order is eroding, and its collapse seems increasingly plausible. Thus, these benefits to the United States are in growing doubt, with the attendant rise in nuclear danger to the United States and more generally. Many now doubt whether we will get to 2045 and the 100th anniversary of the bombings of Hiroshima and Nagasaki with the nuclear taboo intact.

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2. The stability and durability of the international nuclear order depends in part on the stability and durability of the international political order. Today, the international political order is also eroding. Relations among the major powers are increasingly adversarial, international norms are increasingly contested, the U.S. leadership role is increasingly uncertain, and alignments and political preferences are reforming around new expectations. Opponents of the existing order, led by Moscow and Beijing, seek a world with much-diminished U.S. influence and built on values different from the post-World War II liberal international order. At the same time, the Western world has become less committed to that order and the United States has become less committed to its traditional leadership role. The resulting situation is both fragile and volatile.

3. These observations are complicated by the fact that there is no agreed definition of the international nuclear order. Some experts associate this order with the web of nuclear-relevant international treaties for nonproliferation, arms control, and disarmament and their associated implementation mechanisms and the associated norms against nuclear weapons. Others associate this order with the balance of nuclear power among nuclear-armed states.

4. Whichever view one takes, erosion is substantial, and more trouble lies ahead. The erosion of the treaty regime is evident in the near complete demise of arms control and rapidly rising concern that the political bargain at the heart of the NPT is on the verge of collapse. The erosion of the nuclear balance of power is evident in the ongoing expansion and diversification of the nuclear arsenals of Russia and China and in the reluctance of the United States and its allies to reembrace nuclear deterrence after the long post-Cold War interregnum. There is also a widespread belief that the war in Ukraine will yet teach important and probably unhelpful lessons about the utility of nuclear coercion.

5. There is also no agreed definition of the international political order. It is useful to conceive of three interrelated strands. One is the U.S.-led post-WWII security order reflected in U.S.-led alliance structures. Another is the liberal international order built on the principle of multilateralism and reflected above all in the principles of the UN charter. Finally, there is the rules-based international order governing international economic and political cooperation on multiple functional issues.

6. At a high level of generality, the international political order is contracting. This reflects multiple factors, including the rise of revisionist leaders in Russia and China, the emerging axis of authoritarians, the growing influence of some middle powers as aspiring rule setters, faltering in the Western narrative, reduced U.S. consistency, loss of U.S. public support for interventionism, the retreat from globalization, erosion of the rules of the use of force, the paralysis of the UN Security Council, and a widespread perception that the United States has become hypocritical in its exercise of power.

7. A contracted international political order may long survive with skillful diplomacy and luck. But the international nuclear order may not long survive a contracted political order, especially when a falling out among the major powers is at the core of the international political problem. Views differ sharply on whether the collapse of the nuclear order is imminent. Some see the NPT regime as having proven durable through decades of volatility and difficulty and thus likely to survive challenges. Others judge that the erosion is advanced but not yet critical. Still others judge that collapse is already underway with the hollowing out of institutions, norms, and expectations, concluding that the regime will disappear with a whimper, not a bang. This view is reinforced by the judgment of some that strategic stability among the United States, Russia, and China is slowly but steadily giving way to a much more unpredictable and dangerous situation as a result of a new tripolar offense-defense arms race.

8. Crosscutting the normative and Realpolitik visions of nuclear order is the U.S. practice of extended nuclear deterrence. This practice has been essential for both achieving our nonproliferation goals and securing the safety of our allies and the stability of the regions in which they live, thus making America safer. But the practice is under growing duress. On the one hand, threats to allies in both Europe and Asia are growing. On the other hand, doubts about the political resolve of the United States to defend these allies, especially when presented with new nuclear threats, have resurged. A tipping point may soon be reached at which one or more allies, in one or more regions, crosses the nuclear threshold. The possibility also remains that this could precipitate a cascade of proliferation among U.S. allies and more generally. This would inevitably result in a collapse of the nonproliferation regime and a dramatic growth in the risk of nuclear conflict and of the diversion of nuclear materials and technologies and possibly weapons to non-state actors.

9. Potential successors to the current international nuclear order are numerous. The best case would be rapid progress to disarmament as envisioned by the nuclear ban treaty; but this future simply is not plausible in today's security environment. The worst case would be rapid descent into nuclear conflict and the normalization of nuclear weapons as instruments of war fighting; this too seems highly unlikely in today's security environment. More likely is that erosion will either slow or accelerate. Either would seem to require some kind of political shock, delivered with some dramatic development in nuclear diplomacy or security. For example, some states might announce an intent to withdraw from the NPT, perhaps suspending that decision before actual withdrawal as a way to pressure the P5 to disarm. Nuclear war in South Asia or Russian nuclear employment in Ukraine could also generate major changes in the international nuclear order.

10. At a time of growing doubt about the U.S. leadership role, it is appropriate and useful to ask what forms of leadership might and can be expected of others. China might be willing to step into some of the roles that the United States might no longer play; but its policy agenda would

likely diverge sharply from U.S. preferences. States in the Global South might be able to exercise more constructive influence than heretofore; but many appear already committed to the principles of the TPNW. Leadership might also be exercised by individuals and organizations outside the governmental realm. Civil society networks have an important role to play in both substantive and political respects.

11. In these perilous times, U.S. policy should be guided by the following principles: don't live in the past by aspiring to rebuild what is lost; instead, build what is needed now. Do not let the perfect be the enemy of the good enough. Shore up institutions. Ensure accountability. Buy time and plan to use it constructively. Exploit novel network systems. Use what we've got, institutionally and politically, while trying to build what we need. Avoid unforced errors.

12. With Moscow and Beijing, don't give up on engagement. But keep near-term expectations low. And think of this as a long-term project. In current circumstances, Putin and Xi want the United States and its allies to worry about nuclear risk. They're also more confident in running more of their own nuclear risks. But this does not mean that they would welcome the catastrophic failure of the international nuclear order and the rise in direct nuclear threats to Russia and China that would come with it. Thus, a foundation for cooperation with them and/or their successors remains and can be rediscovered politically, in due course. The United States should not abandon the project of setting the conditions for a successful future dialogue and a renewal of some modes of cooperation and support of nuclear order, even while it responds to the consequences of the eroded order. It should do its homework to define the elements of a political bargain among the three that serves the interests of all three—a result that will require the United States to give something in order to get what it desires. It must also tend to the requirements of the nuclear balance of power with a more robust extended nuclear deterrent and a central strategic deterrent tailored to the two-peer challenge.

Panel 1: The Contracting "Rules-Based" International *Political* Order

- Why is the order contracting? What do its opponents seek? What do we seek?
- How is it contracting?
- Can a contracted and contested international political order long survive?

This panel explored the existing 'rules-based' international political order where the United States remains at the center providing leadership in international organizations, especially within the nuclear proliferation sector. As China continues to grow its political and military power, Russia continues to push against international norms, and the United States is approaching a more isolationist approach to the current global order, questions about what the future international political order will look like and who will lead it remain. This panel sought to answer these questions about the current contracting order, the goals of the United States, goals of the U.S.'s opponents and how long the contested international political order can survive.

First, the panel discussed the external pressure from China and Russia as one of the largest contributors to the rising tensions to the current contracting order. Great power competition is fueling division among middle and smaller powers and casting doubts on the international order. The great powers also lack a shared vision, hindering their ability to reach any consensus on global issues such as arms control. Unlike the Cold War era, where both the Soviet Union and the United States recognized a mutual vulnerability with the introduction of nuclear weapons and worked together to avoid large-scale conflict, great powers today struggle to find common ground.

The great powers are also struggling with a lack of consensus, as they cannot separate issues such as nuclear order and political disputes from the greater interest. Russia's violations of international law in Ukraine are also normalizing disregard for the current international political order without reprisal and furthering issues for compartmentalization. Great powers are approaching collaboration with each other in a win/lose mindset, instead of a win/win mindset. Neither side is willing to sacrifice some of their interests to ensure a decision is still met, as they do not want to be viewed as the 'loser.' Finally, great powers, especially the United States, are facing growing domestic political pressures to backout of the current international political order and focus their funding and resources inwardly.

As China and Russia continue to push against the international political order, their actions call into question what their ultimate objectives are. While their goals each differ slightly, neither wish to participate in a system they believe was created by the West (specifically the United States) without their participation. China is seeking to challenge the U.S.'s global power, both politically and militarily, and seems to be working towards a revision of current international norms (e.g. less interference in domestic affairs, territorial revisions, etc.). Russia is also seeking to disrupt the current order; but unlike China that is seeking to take the U.S.'s spot in the global order, Russia seeks to establish a multipolar international order and protect its own sphere of influence. Both seek to bring down an "American-led" or "liberal international" order and replace it with a "rules-based" order that is compatible with a bi- or multipolar world. This order would still provide basic norms of predictability but would be based on specific rules established by China and/or Russia.

In contrast, the United States seems to be lacking a clear vision for how the international political order should be run as it battles domestic isolationist pressures and external pressures from China and Russia. Overall, the United States (and the West) seek to preserve stability and predictability, especially on issues such as arms control and trade. It has also been signaling support for inclusiveness (with constraints) that would accommodate rising great powers.

Despite all these challenges, the panel concluded that the contracted and contested international political order will survive in the short/medium term, but its long-term survival remains uncertain. In the short to medium-term, the current order will continue to persist due to systems outside of security such as shipping, aviation, and trade that are upheld for mutual benefit. The long-term survival of the international political order is however dependent on the United States and its willingness to either step aside or to take the lead in developing a new, and more comprehensive system.

Overall, the panel ended with an optimistic note about the future of the international political order, but with a warning: the international order is not past the point of no return but will require diplomatic efforts and mindset shifts on all sides to achieve a system that is mutually beneficial to all. If great powers can work together through diplomacy and alter their strategic mindset, compartmentalize political issues and focus on mutually beneficial agreements, then the contested international political order may be rebuilt and may continue to survive.

Panel 2: The Eroding International *Nuclear* Order

- What are the constituent elements of that order?
- Why and how are they eroding?
- How far has the erosion progressed?

The Cold War provides helpful lessons for contextualizing the current nuclear order. The nuclear order was stable during the Cold War for two reasons. First, the bipolar structure created greater clarity, simplicity, and minimized uncertainty on dynamics of competition. This led to a common understanding of strategic stability and the risks associated with arms racing. Second, U.S. leadership and hegemony in both Europe and Asia, as well as its alliance relationships, contributed to stability. This made it easier to establish a nonproliferation regime, which many countries were willing to join.

The panelists argued that the order survived after the collapse of the Soviet Union due to effective diplomacy by the Bush and Clinton administrations and international institutions that allowed the United States, Russia, and the former Soviet states to agree on continuity to establish an equilibrium in the international system. Further, American and Russian commitment to strategic stability and the U.S.'s recommitment to allies in Europe and the Indo-Pacific contributed to the sustainment of the global nuclear order.

Several key differences exist today. First, there are three major nuclear powers that complicate strategic stability. Second, there are active wars happening in core regions of these powers' interests. Third, there is significant proliferation potential in a range of core regions of interest.

Fourth, developments in conventional military capabilities, including drones and electronic warfare, are changing the escalation ladder within the conventional sphere. Fifth, the future of American leadership remains uncertain. It's becoming clear that the current trends, such as questioning commitments to key allies, go beyond the current political moment.

Three key elements comprise the existing nuclear order. The first element is the nuclear weapons states themselves, including their weapons, doctrine/strategy, and force posture. In general, these states handle their weapons with precision and care. There haven't been any nuclear pariah states, with the exception of the DPRK. Russia may be descending into pariah status given its recent reckless behavior. The second element is the network of deterrence relationships between nuclear weapons states based on both their capabilities and force structure as well as "mind games" in their efforts to demonstrate their resolve. The third element is the international nonproliferation regime, including the IAEA and the NPT.

Participants emphasized the need to think through how conventional threats could play a role in preventing nuclear use. The development of long-range conventional precision strike capabilities, for example, could hold strategic assets at risk. Some experts believe that conventional deterrence played an important role in deterring President Putin from nuclear escalation in October 2022, although there is debate on whether this was the driving factor in leading him to back down. Another important factor was the public reproval from President Xi and Prime Minister Modi, which helped convince Putin to walk back his nuclear rhetoric. Further, one expert argued that we cannot consider about nuclear and non-nuclear capabilities separately: U.S. adversaries view warfighting as a continuum, starting with cyber, continuing with space and other weapons, and leading to nuclear weapons. Current DOD discussions focus on resiliency, but more concrete steps should be taken and partnerships established. It is also imperative that we further develop our offensive posture.

In discussing why and how the nuclear order is eroding, participants highlighted several points. First, the NPT is on the verge of collapse because of Chinese nuclear modernization and Russia's behavior. Chinese nuclear modernization is putting pressure on the United States to increase its nuclear stockpile. The idea of tactical, limited nuclear use is also eroding the nonproliferation regime. Second, the speed of technological change is affecting the IAEA's ability to monitor nuclear regimes. This rapid change also brings benefits to nonproliferation efforts, including improving monitoring and verification of nuclear regimes, especially for smaller objects like warheads. Third, the war in Ukraine is significantly affecting the nuclear order. Whether or not Putin was deterred by conventional weapons during October 2022, the discussion suggested a potential change in the nuclear taboo. As evidence of this shift, more experts are engaging in conversations about the implications of limited nuclear use in that context.

Participants noted that the demise of the legacy arms control regime is up for debate as the discussion attempted to explore how far erosion may have progressed. Some panelists and experts noted that President Trump is uniquely situated to prevent its demise and is trying actively to resuscitate it. Relatedly, the discussion noted that there may need to be increased support for President Trump’s efforts to revive this regime, as well as an interest in completing the nuclear triad modernization, getting China to the negotiating table, and sustaining controls on nuclear proliferation.

The reduction in funding for arms control and nuclear deterrence in the United States comes from a lack of understanding and appreciation of nuclear risks within our broader strategic community.

These issues are often seen as abstract to policymakers. While much of the funding is allocated for new technologies and nuclear weapons, which is needed, it may also be necessary to build sustainable infrastructure in this field by investing in the nuclear regime in a policy-agnostic way.

Looking to the future, the panel noted that there may be a need to bring disparate communities together for discourse. There is often a barrier between the arms control/nonproliferation community and the nuclear strategy/doctrine/force structure community. Experts who have focused on nuclear risk reduction and counterterrorism in the past need to be ready to revive the deterrence community, because this could be the way that we can resume cooperation with Russia and China.

Panel 3: The Non-Proliferation Regime: In Transition or Collapse?

- If in transition, to what? If in collapse, why?
- How can we distinguish between transition and collapse?
- What impact has the demise of the legacy arms control structure had on the nonproliferation regime? Would some extension of restraint by the U.S. and Russia have a significant positive impact on the regime?

Over the past few decades, the nuclear order has evolved alongside transitions in the global order. As the Soviet Union emerged as a new nuclear power during the Cold War, the global and nuclear order shifted from unipolarity to bipolarity. Both Moscow and Washington agreed to limit the spread of nuclear weapons, partially in an attempt to consolidate their own power. This led to the creation of the Treaty on the Non-Proliferation of Nuclear Weapons (NPT) in 1968 by the United States and the Soviet Union.

Post-Cold War, the United States emerged as a global hegemon, but the world order remained largely bipolar. Nonproliferation remained a primary concern, and as the United States crafted international institutions in its favor, it also intertwined nonproliferation with larger ideals such as peace, justice, and the Responsibility to Protect. The decline of Russia as another world power caused it to have less incentive to follow the nuclear norms it had helped to create, as those in Moscow had little institutional memory of their predecessors that helped create the NPT.

The panel largely agreed that the NPT is currently in transition, and that the three pillars of non-proliferation, disarmament, and the peaceful use of nuclear energy, are presently under threat. We currently live in an age of both nuclear and global multipolarity, where nonproliferation is less of a priority than it has been historically, and there are more challenges to the nuclear order than ever before. Many more countries have greater ability and greater incentives to develop nuclear weapons programs, and the nuclear taboo has also weakened as the idea of limited nuclear use is now seen as plausible by many leaders. Furthermore, the panel argued that the demise of arms control and the death of the New START Treaty has increased incentives to develop nuclear weapons. Lastly, there is also a greater concern amongst U.S. allies that the United States will fail to meet commitments of extended deterrence. This, in turn, increases the likelihood that allies will seek to gain nuclear weapons for their own protection.

Moreover, revisionist powers, such as China, have also expanded their nuclear arsenals, and both China and Russia have increased support to North Korea - a nuclear pariah. These states seek to exploit Western legitimacy, and it may be too optimistic to expect their collaboration. In the event of the U.S. withdrawal from nuclear order, China will likely step up to take its place. All of these dynamics threaten the nuclear regime.

Further, the panel discussed the conditions under which a collapse might occur, i.e. if a number of countries were to withdraw from the NPT and proliferate, or a country was to use nuclear weapons in conflict. Most likely, the collapse of the nuclear regime wouldn't occur through one sudden shock, but through a shrinking, pulling back and weakening of nonproliferation values. This would likely occur as a gradual erosion.

However, despite these challenges, transition doesn't necessarily signify collapse. Many states still comply with nuclear norms, and the international community has not seen widespread violations or condemnations of the pillars of the NPT. Historically, the international system has been able to adapt and recover during times of tension. As noted by the discussion, the NPT will exist as long as the ideas that hold it together exist. Historically, the NPT has been stronger at certain times and weaker at others – it is important that leaders continue to uphold nonproliferation norms regardless of hardships.

The United States is in a unique role as a hegemon and a member of the P5; it is one of the final arbiters of the majority of international law. However, this also makes it subject to higher standards of hypocrisy evaluation. U.S. leadership must consider the effects that international nuclear proliferation may have and assess how they could address current tensions and prepare in the event of a collapse. Some hedging strategies proposed were improving intelligence collection on proliferation efforts and advancing the U.S. missile defense program.

The restraint of nuclear powers such as Russia and the United States would likely have a positive impact on the regime. However, with enough international support, nuclear norms could continue even if Washington steps away from crafting the nuclear order. Under these conditions, countries such as South Korea and Japan may be able to play larger roles in upholding the existing nuclear regime.

Many participants raised the idea that the collapse of the NPT could present an opportunity to create an improved nuclear regime in its place, similar to how the profound shock of the collapse of the League of Nations was leveraged to create the United Nations. Following a collapse, countries could save the "good" parts of the Nonproliferation Treaty, such as the right to the peaceful use of nuclear energy.

Attempts to revitalize the NPT should involve various perspectives. The discussion argued for including supporters of the Treaty on the Prohibition of Nuclear Weapons in crafting a new nuclear order. One member raised the idea that following a collapse, Western nations should work with non-nuclear allies and countries in the Global South to address their concerns with the inherent inequality of the NPT. The United States should also address allies' concern over the potential pullback of U.S. extended deterrence.

Those in the nuclear field have a responsibility to raise awareness of the challenges that currently exist. These efforts should be supported by international law, maintained through attribution and

accountability, orderly processing of norms. Progress in rebuilding nuclear norms may be incremental, but that does not make it any less important.

Panel 4: The Dynamic Balance of Power Between and Among the Nuclear Weapons States

- Is that balance becoming more or less stable as Russia, China, and the U.S. modernize and adapt their nuclear forces?
- How might the balance be transformed? Tech developments? Policy choices? Shocks?
- Given arms control's demise, what opportunities remain to regulate the balance?

There is still reason to be optimistic about international remediation of an off-kilter nuclear balance. The Trump administration may view the U.S.'s stewardship of the post-World-War-II order, nuclear or otherwise, as worth upholding. Moreover, the United States can counter the destabilizing effects adversaries create through nuclear coercion, financial support or armament of non-state actors and rogue states, and inflammatory tests.

Russia poses a more acute threat than China's competitive threat, as Moscow may push for horizontal escalation that could bring the United States or NATO into at least a conventional war in Europe. Some participants argued that the U.S. deterrent be trained on Russia in the near-term, but Washington can exercise deterrence against China with longer-term revitalization of the bomber leg and standing up the nuclear sea-launched cruise missile (SLCM-N). Others stressed that the United States must urgently address Beijing's silo buildout, early warning pursuits, and various space capabilities. China's growing efforts in artificial intelligence, autonomy, undersea warfare, and an 'intelligentized' military also require greater attention.

Irrespective of whether China is the U.S.'s primary or secondary military threat, the United States should enhance the credibility of extended deterrence in Asia - not least due to is potency as a non-proliferation instrument - through practical deployments of in-theater capabilities and dual-capable aircraft. Outside of consulting allies and partners in the Indo-Pacific, the panel discussed whether the United States could coordinate with the United Kingdom and France on conventional and nuclear issues. Participants supported the U.K.'s pursuit of adding an air leg, as well as France adopting a greater role in NATO's extended deterrent. Similarly, participants lauded the advantages of visible capabilities (both weapons and delivery vehicles), discussing the limitations of SLCM-N, and the possible need for allied conversations on ground-launched cruise missiles.

Additionally, allies should independently collaborate, while the United States inwardly focuses on its nuclear modernization, particularly with respect to constraining China. In this fragile environment, the United States may also expect allies to engage in a conventional military buildup and should maximize technological sharing for those purposes. Further, the panel explored whether Washington should take care to ensure existing norms remain steadfast and that novel problem sets (e.g., emerging technologies, provocative tests) introduce new norms.

Moreover, the United States must reckon with the fundamental objectives of its deterrence strategy—questions around whether nuclear weapons are designed to threaten intolerable costs,

project power, serve as leverage in regional crises, etc., will shape force posture, especially in response to evolving Chinese and Russian nuclear thinking.

The United States could conceivably become more reliant on nuclear signaling, perhaps as a response to the dollar's declining value, not sufficiently building conventional capabilities (especially in the event of opportunistic conflict in both Europe and the Indo-Pacific), or a lack of credible deterrent messaging. Participants also considered how the United States should analyze what adversaries value most, the tentative conclusion being that changing the U.S.'s current counterforce approach is the least bad option, as limiting damage against Russia and Chinese strikes does not require massively augmenting or innovating within the current arsenal, nor changing Washington's stance on nuclear explosive testing.

Naturally, force posture informs goals to supplant a soon-to-be obsolete New Strategic Arms Reduction Treaty (New START). On one hand, arms control may be asleep, but not dead, and the geopolitical environment might find balance through cohesive alliances, rearmament among U.S. allies, and cooperative military engagement with adversaries. Alternatively, arms control may be unlikely to succeed in the near future due to adversaries' keenness on nuclear modernization, especially as the United States vies to meet deterrence requirements.

More productive initiatives include robust missile defense for the homeland; early efforts can prioritize protecting consequential targets of a conventional or nuclear first strike, such as critical infrastructure. More ambitious missile defense may address assets in the global commons (e.g., interceptors in space). Missile defense appears more promising now than it did decades ago in light of China's conventional and nuclear intercontinental ballistic missile capabilities and Fractional Orbital Bombardment System test. Speakers agreed on the need to urgently define which targets, such as critical infrastructure nodes and delivery systems, are most at risk, and in which domains are most likely to see threats.

Overall, participants concurred that the balance between nuclear powers is increasingly unstable as Chinese, Russian, and U.S. nuclear forces modernize. Rapid technological developments, nuclear saber-rattling, reduced transparency measures, and increasingly opaque or confounding nuclear-use doctrines are to blame for this erosion. Regarding mitigation, participants disagreed on the extent to which arms control initiatives could be salvaged, but participants did agree that U.S. allies can play a substantial role in upholding extended deterrence and nonproliferation efforts - either in place of or supplementing future arms control agreements. Participants emphasized the need for serious conversations around implementing missile defense, but questions remained around how such a change might shape U.S. and adversarial nuclear perceptions and policies. Additionally, questions remained about which technologies would be most transformative in a post-New-START environment, as well as whether Russia and China have clear mutual interests with the U.S. in maintaining even informal arms control measures.

Panel 5: The Tattered U.S. Nuclear Umbrella

- How do allied concerns affect the nuclear order?
- How plausible is a nuclear cascade among U.S. allies and partners?
- How plausible is a renewal of allied assurance?

This panel explored how allies are shaping the nuclear order. From the Indo-Pacific perspective, there are four primary drivers of alliance anxiety: external threats, the decline of U.S. commitment, the deterioration of global nuclear premises, and domestic political environments. First, Japan is concerned about the North Korean and Chinese nuclear build up, the rise of potential flashpoints for conflicts (i.e. the Taiwan Strait, the South China Sea), and the influence of the nuclear shadow across the region. Japan and South Korea exist under the nuclear shadow cast by China and North Korea, which influences the security dynamics of the region. Second, Japan and South Korea are also concerned by the U.S.'s increasingly transactional approach to alliances and the potential for the United States to demand sharp increases in defense spending. Third, Russia's behavior in the war in Ukraine has eroded the norm of nuclear nonuse. Fourth, there is growing interest in both Japan and South Korea in discussing the possible nuclear options, but in different forms. According to surveys, 70% of the South Korean public support it in developing a nuclear option and 70% of the Japanese public support discussing nuclear sharing options. The majority of the Japanese public supports retaining the three non-nuclear principles, but some are arguing that they should be changed to allow the United States to deploy nuclear weapons in Japan.

From the European perspective, European states are shifting their perspective on the credibility of the alliance. Recently, the United Kingdom acquired 12 nuclear-capable F-35As, which can be seen as a vote of confidence in the durability of U.S. extended deterrence to Europe, and the durability of NATO and its nuclear sharing arrangements. Further, U.S. leadership recently confirmed the viability of Article 5 and the continued work on NATO's deterrence and defense posture, including in the nuclear domain.

At the same time, European allies remain concerned about Russia's actions, which influence Europe's threat assessment and have triggered debate about a European nuclear program. These include Russia’s nuclear modernization, development of non-strategic nuclear capabilities, and updates to its nuclear doctrine lowering the threshold for nuclear use. Russia has made nuclear signals, come directed at European countries, such as the use of its intermediate-range Oreshnik missiles. The level of nuclear anxiety is high among European populations; polls in Germany show support for a European nuclear program, while polls in Turkey and Poland show support for national programs; at the same time, they view themselves as good nuclear citizens who remain interested in supporting nonproliferation and arms control. They have a stake in the existing nuclear order and would not easily contribute to its dismantlement. Europe wants to construct a new transatlantic bargain, demonstrating that they can share the defense burden if the United States maintains extended deterrence. Other paths for the relationship would be less attractive from the European perspective. One potential possibility is if the United States were to gradually limit its engagement in Europe, other allies would increase engagement, with extended deterrence left as the final stage in the process. European states want to avoid any sudden death of the alliance, and there is a strong preference to maintain the transatlantic bargain in this new security environment.

When considering how plausible a nuclear cascade is among U.S. allies and partners, European and Indo-Pacific participants had different views. Risk of nuclear cascade in Japan is low, but not negligible. Japan has the technical capabilities and material stockpile, but this would need to be developed into usable warheads. This would be a long-term project; the question is whether China and North Korea can wait for Japan to have nuclear weapons. There are political and normative constraints in Japan, and the nuclear taboo among the public is still strong. The political leaders

likely do not have the confidence to break this taboo. The risk in South Korea is higher. But when it comes to real discussions about what capabilities it should have and how the alliance with the United States would change, experts talk more cautiously about nuclear options. If either Japan or South Korea pursue nuclear weapons, the other is also likely to pursue nuclear capabilities.

On the other hand, a nuclear cascade seems implausible in the European case for several reasons. British and French capabilities are available as a fallback. The recent Northwood Declaration stated that there are no extreme threats to Europe that would not prompt a response from both the United Kingdom and France. Any European deterrent would be centered around French and British capabilities. European states also still have respect for the rules-based international order and NPT obligations. The cost and threat of Russian counteraction also make cascade less likely. The network of bilateral and mini-lateral arrangements makes the European security architecture strong. The potential for a nuclear cascade in Europe and the Indo-Pacific is contingent on the commitment of U.S. extended deterrence. As long as alliance credibility remains strong, there is limited possibility of nuclear cascade.

From the Indo-Pacific perspective, renewed allied assurance is plausible, but it's very difficult for Japan and South Korea to build assurances from the United States. South Korea works through the Nuclear Consultative Group, but these discussions remain at the conceptual level. Further, South Korea is concerned about how they are going to counter North Korea, especially the possibility of a nuclear contingency. For Japan, keeping and strengthening the extended deterrence dialogue is important. Japan remains uncertain about which conditions would necessitate that the United States use nuclear options in the event of a regional conflict. Without better insight, it is difficult for Japan to make its efforts at cooperation more functional. Reaffirmation of the alliance at the highest levels would also be useful in making the commitment more credible and providing assurance to the public. Institutional alliances and regional cooperation can be strengthened through trilateral cooperation with the Philippines and Australia, who share the same threats. At the operational level, it is important for the United States and Japan to improve command and control. Japan is also building up its counterstrike capabilities to improve its self-defense. One of the takeaways from the discussion is that it may be helpful for Japan to enhance its defense industrial cooperation to establish secure supply chains of ammunition and other equipment.

The panel discussion also noted that most European leaders would welcome further U.S. statements on assurance and actions to confirm the extended deterrence guarantees. This would require a consistent set of actions on the U.S. side, reciprocated by NATO allies. The ultimate assurance would be confirmation that the United States would confirm its guarantees in response to Russian nuclear intimidation. Beyond that, in the nuclear domain, any signals about U.S. engagement in the revival of NATO nuclear sharing is important. These include nuclear planning at SHAPE, looking at the relationship between nuclear and other elements of NATO's deterrence and defense planning, continued visits of U.S. strategic bombers and SSBNs, and continued U.S. capability developments that would be useful for regional contingencies, including SLCM-N. U.S. support to Ukraine would also be seen as a major assurance to European allies. Lastly, any changes in the conventional posture in Europe would put assurance into question, unless there was proper communication with allies.

To demonstrate the value of alliances to the U.S. public, it may be helpful to broaden the scope of the discussion. This can include framing alliances as force multipliers and emphasizing the non-military elements of the partnership, including technology and economy. Extended deterrence can

be presented as a way of avoiding conflicts that would have serious consequences for the United States and might require intervention.

Participants discussed linkages between the European and Indo-Pacific theaters. Developments in Europe are closely linked to the Indo-Pacific. One connection is psychological: states through the Indo-Pacific region are closely followed developments in Europe and how the allies function as a guide for what happen elsewhere. Another dynamic of interest is the specter of cooperation between Russia, North Korea, and China in warfighting capabilities. This requires better preparation and coordination in both theaters. Bilateral and mini-lateral platforms allow for consultation between allies from both regions. In sum, there are a lot of lessons to be learned from their shared experiences that could benefit both theaters.

Allies in both theaters are learning lessons from the nuclear shadow over the war in Ukraine. First, for allies in the Indo-Pacific, it is clear that making the munitions supply chains more resilient will be of critical importance. Another lesson is to aim to avoid the development of the stability-instability paradox in the Indo-Pacific. Further, there may be some important lessons and parallels to be drawn from the events in Ukraine for Taiwan. In addition, there is a growing interest in Japan to study signaling and saber-rattling to better understand what signals are effective and have influenced the psyche of European states. European allies learned that Russia is willing to use nuclear intimidation in the early stages of a crisis and war. This nuclear intimidation is aimed at alliance cohesion and seeks to separate Ukraine from its European supporters. Lastly, it will be important to further explore whether and how Russia may be deterred by robust nuclear countersignaling. It seems that the Russian leadership understands the uncertainty and consequences that could result from crossing the nuclear threshold.

Panel 6: Imagining Alternative Nuclear Futures

- What alternative futures are plausible in the near to medium term? What would be their constituent elements?
- If the existing order dramatically collapses, perhaps with nuclear employment, is a follow-on order even plausible? Why?
- What new alignments and norms might take shape in a post-collapse order?

The discussion focused on envisioning alternative nuclear futures. First, the panelists argued for perhaps moving away from evaluating in terms of complete success or failure and instead viewing the collapse of the nuclear regime as a spectrum of best to worst case scenarios. Second, alternative futures will be shaped by a compounding set of interrelated challenges, such as the resurgence of authoritarianism and breakdown of democratic institutions, pressures of nuclear AI integration and the erosion of a U.S. rules-based order. Third, the manner in which shocks to the system occur will determine what alternative nuclear scenarios emerge. It is important to understand how these shocks may work in concert with one another or have compounding effects and consider the difference between symptoms and root causes of collapse.

The panel explored several plausible alternative nuclear futures that could lead to a collapse, including the testing of nuclear weapons or the accidental use of weapons, including the use of nuclear weapons against the U.S. homeland. Another commonly cited future would involve the

tactical first use of nuclear weapons, or a low-level, low causality tactical strike (potentially in a conflict between India and Pakistan). Nuclear use could also lead to a new world order where limited nuclear use is normalized, and more countries acquire nuclear weapons to ensure their own survival. The panel discussed whether there are ways in which countries could learn to live with small-scale nuclear use; further, there is also the possibility that increased proliferation may lead to greater stability.

Another plausible scenario for collapse would be nuclear proliferation among U.S. allies as U.S. extended deterrence commitments seemingly weaken. However, this largely depends on which countries proliferate; proliferation by countries such as South Korea and Ukraine would likely be viewed upon more favorably by the international system since there is a perceived legitimacy given the existential threats that both face by neighboring adversaries.

Most likely, the collapse of the NPT will occur through a "zombie treaty", or "rump regime." In these scenarios, the nonproliferation treaty would still exist but there would be widespread noncompliance and hedging against nuclear use, and nuclear technology would be easily transferrable. This may be precipitated through a variety of means, such as increased pressure to Article 6, continued U.S. extended deterrence in Asia, and increased military posturing with China. Allies may also seek to acquire nuclear weapons amidst U.S. retrenchment on extended deterrence, or states could begin to hedge by advancing latent nuclear capabilities.

There are a variety of factors that could be involved in the collapse of the nuclear regime. One of the most likely is the disintegration of norms and institutions created to uphold the nuclear order. This could occur through a breakdown of international society writ large, leading to nuclear use and possibly widespread horror, and eventual condemnation of future nuclear use.

A second factor may be the enforcement and verification power of the nonproliferation treaty. If measures supporting the NPT, such as export controls, sanctions, or United Nations inspections were significantly weakened, it would likely lead to institutional paralysis, followed by a demand for reform.

Third, it will be important to consider the collapse is the perceived legitimacy of nuclear actors, and how they're viewed in the broader international system. The role of the United States in reconstructing the nuclear order lies with legitimacy. The panel explored how some parts of the international community believe the United States is not acting in the interest of other states. This will shape foreign perception of U.S. actions, especially in efforts to reconstruct the nuclear regime. It is important that the United States must not be seen as imposing our will on others and instead appeal to the interests of all nations.

The panel also explored how legal regimes may act as a constituent element to the nuclear order and lend legitimacy to state action. Experts discussed the role of litigation in shaping and enforcing nuclear norms- such as perceived violations of Article 6 by nuclear weapons states. The role of legitimacy of verification measures also matters, as does credibility of information. The panelists also discussed the growth of state-led information operations by adversaries, in which disinformation is spread to form malicious narratives against the United States. It is possible that accidental nuclear use may be politicized in a way to appear intentional or catastrophic. One potential way to counter this would be to rebuild the scientific dialogue amongst countries of nuclear weapons states.

We can imagine new alignments and norms that would emerge from a post-collapse order by assessing existing trends and emergent data. One such trends is the advancement of technology and AI. Although it could have destabilizing effects, it may also strengthen the regime through improved methods for verification and increased transparency of nuclear programs.

Experts discussed what it would take to restructure and repair the NPT, starting with a re-dedication to norms and institutions and a reckoning of the institutions that currently exist. The panel also discussed the importance of addressing violations of Article 6 in rebuilding nuclear order. Other efforts included working with allies, non-nuclear states, and supporters of nuclear disarmament to create a renewed nuclear regime. One way to accomplish this would be for the United States to support adding new obligations and missions to the regime, such as the introduction of the Nuclear Suppliers Group, responsible for controlling the export of nuclear materials and technologies. There may also be the possibility of using the resurgence in nuclear energy to re-invigorate the IAEA and possibly using blockchain and AI to revitalize our ability to monitor nuclear operations worldwide.

The panel discussion differed in their recommendations for how the United States should address Russia and China when seeking to restore nuclear norms. Many argued that the United States should seek to understand the Russian and Chinese perspectives on these issues, and that Washington should aim to convince these countries that they have a stake in upholding nuclear norms. Another line of argument argued that the Russian and Chinese perspective is clear: these countries are willfully complicit in dismantling the international order, and do not value norms of nonproliferation and humanitarian values- they're not interested in rebuilding the NPT.

Participants were largely hopeful in revitalizing the nuclear order, raising the point that the international system has suffered shocks before and adapted. The panelists concluded that the United States is an indispensable power, and the removal of American leadership and diplomacy may result in the collapse of the regime and present an unstable security environment. However, the United States and allies could very well be able to move in a new direction and take substantial steps towards repair.

Panel 7: Toward a New Strategy for Nuclear Order

- How can international stakeholders in nuclear order most effectively work together to safeguard nuclear order and promote its continued peaceful evolution?
- What can be accomplished in the absence of a stable global political order?

This panel sought to provide guidance for developing a new strategy for nuclear order by incorporating lessons from history and looking to the future for improved communication and technology incorporation. Whether it was specifically dealing with U.S. interests, motivating allies, or emphasizing a mutual vulnerability for all nuclear states, the panel outlined multiple areas in need of adjustment to create a new strategy. It sought to answer two primary questions about how international stakeholders can most effectively work together to safeguard nuclear order and what can be accomplished in the absence of a stable global political order.

Looking first at the role of international stakeholders, the panel stressed the importance of moving away from the past and instead trying to redefine and adapt their strategy to the needs of today. Although past treaties and framework should not be disregarded, the panel stressed that they should be used as a baseline to develop a new strategy, not as a blueprint. The US and its allies need to work to strengthen existing institutions, such as the UN with the help of regional parties such as the EU and African unions, to reenforce the importance of legal commitments and Western norms. By broadening stakeholder involvement with more regional organizations, it promotes accountability and builds resilience up and down the chain.

Network systems should be further utilized to help create regional dynamics and provide status for norms. Organizations such as the African Commission on Nuclear Energy (AFCONE) and the African Union can help pilot new norms and build resilient order, even when international political momentum is lacking. The shift away from relying solely on top-down international treaties has promoted regional regulatory bodies to enhance their legal and regulatory frameworks.

For example, Putin's war in Ukraine and consistent disregard for international law since taking power without strong pushback from the West and international organizations threatens the stability of the existing legal structures. Actions taken by Putin or other adversarial states that are not in compliance with international law are a direct threat to Western values. Broadening the number of stakeholders increases the states willing to uphold and enforce international norms against states (ex. Russia and China) that seek to change them.

The panel provided ways for international stakeholders to be brought together again, especially by creating rallying points for cooperation. The growing risks from emerging technologies and AI should be used to bring stakeholders together and create more common ground for discussion. The panel provided the 2024 joint statement that AI will not control nuclear weapons as a baseline for future accords, as it demonstrates the ability for states to come together over mutual vulnerabilities.

Secondly, the panel examined what can be accomplished in the absence of a stable global political order and reached a few conclusions. First, it found that progress is still possible to adapt strategies and focus on evolving challenges due to many remaining common interests. Despite geopolitical tensions, there are still definable interests in reducing nuclear risks, which can be leveraged for cooperation. In the absence of clear norms, the panel also pushed for the incorporation of war games and scenario-based discussions. "Day after" scenarios demonstrate the risks stakeholders face from an escalating nuclear situation where there is no clear nuclear order. Essentially serving as a wake-up call, these scenarios help demonstrate the dangers of a weak/non-existent nuclear order and encourage both adversaries and allies who have been lacking in their commitments to come to the discussion table.

Without a global order, the role of technology as an equalizer may also be encouraged. The distribution of detection tools and advances in satellite imagery and AI monitoring can decrease the need for formal enforcement mechanisms. The systems make it easier for NGOs to carry out enforcement without needing formal enforcement. Despite these benefits, emerging technologies and AI are not a catch-all to solve all global issues. There are still threats from the absence of a stable global political order. Regional bodies may lack cohesion and resources to enforce norms at a regional level, leading to an increased breakdown of norms. Technology-focused communities may also struggle to gain traction without a clear enforcement mechanism provided by a political

order. Finally, there are many risks of AI misuse that will need to be addressed as they are increasingly incorporated into weapon systems and satellites.

Overall, this panel laid out the groundwork for incorporating international stakeholders and the dangers of trying to maintain a nuclear order without a stable global political order. Many challenges are going to present themselves as the world adjusts to a new strategy for nuclear order and shifting global order, but with the assistance of regional organizations, open communication among great powers, and emerging technologies, there is still hope for a new strategy. While there is no magic wand to solve every issue with one treaty, existing treaties and the NGO sector have made advancements in the nuclear order. If provided with sufficient resources and cooperation from nuclear states, a new strategy can be created to meet the needs of today.

Panel 8: Questions and Challenges Facing the United States

- What is at stake for the United States in the eroding order and its potential collapse?
- Where is U.S. leadership necessary and possible?
- What should it seek from others? Allies? Adversaries? Onlookers?

One can view potential responses to growing global nuclear disorder through at least three perspectives. The first is the isolationist view, unperturbed by worries of a collapsing global order. U.S.-led or liberal international orders are not currently viable options, and the U.S. will not be able to restore its former stature. Washington must, however, continue to avoid great-power conflict - not least due to weapons of mass destruction threats and possibilities for proliferation - and a breakdown of the international economic system. The United States might temporarily be locked into isolationism or 'transactionalism,' but this trend may reverse as Congress and the broader U.S. population rediscover the value of lower prices, international trade, and deep engagement with allies and partners.

The second view is that the U.S. must pursue a comprehensive, national missile defense - in effect, Golden Dome. This view has resurged due to the availability of new technological readiness, though fears persist around adversaries responding with innovations or force expansions. Pursuing missile defense may lead to a no-win, offense-defense space-based arms race between the United States, Russia, and China, as the strategic, economic, political, and practical logic of why the United States cast this project aside half a century ago, remains salient. The panel agreed that, at minimum, the nuclear community needs more refined thinking on 1) how missile defense fits into a broader deterrence and arms control framework, 2) what desirable purposes and attributes of missile defense are (e.g., impenetrability vs. protecting high-value civilian or military infrastructure or assets), as well as 3) whether adversaries would be more or less willing to come to the negotiating table based on this capability.

The third view is that the United States could reemerge as a principal party that supports a global nuclear order only by suffering strategic shocks, such as nuclear terrorism or a state's use of tactical nuclear weapons. Importantly, China and Russia may plan for extreme contingencies out of distrust of even a missile-defenseless United States. Further, U.S. allies and partners are strongly advised to diplomatically suppress nuclear threats and proliferation. Adversaries may decide

through unified western signaling that their interests are served better by today's nuclear order than by undermining it.

It might be possible through some kind of mutual pause on modernization and/or uploading of non-deployed nuclear weapons to convince, for example, Beijing to stop constructing new intercontinental ballistic missile siloes. On the one hand, the discussion explored whether it was unimaginable that great powers would come up with a numerical approach to risk reduction or arms controls, as formal caps and policy moratoriums did not work when tried in previous administrations. Another line of argument suggested that adversaries would ignore or cheat a pause or freeze, and it may be more fruitful to consider limited verification and data exchange mechanisms. Participants who found a "freeze" more compelling stressed the need for formalized monitoring and verification mechanisms in the interim before a more formal agreement, affording time for the United States to complete its program-of-record modernization. Participants agreed that trilateral arms control is infeasible and bilateral efforts more feasible, though they disagreed on parameters for counting warheads and delivery vehicles. Some suggested that incrementalism with respect to arms control and nonproliferation may be effective so long as initiatives are forward-looking; one cannot ameliorate one crisis without foresight of the other.

For experts concerned about the U.S.'s regressing role in maintaining a nuclear order, it is worth exploring prospects for limited cooperation with other great powers, such as discussing escalation pathways with Moscow and Beijing via the P5. Track 1/1.5/2 dialogues between the United States, China, Russia, France, and the United Kingdom are another option, preferably taken in parallel rather than through large, treaty-based dialogues. The panel also examined whether great powers could offer (prior to a new arms control agreement) to live de facto within New Strategic Arms Reduction Treaty force levels after its February 2026 expiration. The discussion also suggested that increased cooperation, even in non-ideal venues, might decrease the chances of spiraling escalation if limited nuclear use did occur, experts should define objectives of interstate discussion now.

According to the panel discussion, the United States should undoubtedly sustain its central strategic deterrent, fortify its extended nuclear deterrent, and integrate the U.S. military and economy with allies and partners, perhaps even by exploring alternative modes of sharing information or assets (as in AUKUS). While the United States expects that its allies and partners will hedge, they should continue to increase defense spending and persevere within regimes like the Treaty on the Non-Proliferation of Nuclear Weapons (NPT); they also should not underestimate U.S. technological dominance, willingness to intervene in external conflicts, and support of other countries' (strategically beneficial) development. Furthermore, the United States and its allies should partake in red-teaming and war-gaming relevant to arms races already underway—e.g., cyber, nuclear command and control, early warning systems, communications, offense-defense missile defense, biotechnology, autonomous systems, and artificial intelligence.

In sum, participants agreed that the United States may be disadvantaged if current global order fades. While the United States could help jumpstart bilateral negotiations, participants were skeptical of multilateral arms control. While participants were split on how quickly the United States could recover and reestablish a responsible international reputation, most agreed that the United States should enhance communication and technological exchange with allies and partners, as well as encourage compliance with the NPT. Moreover, the United States should buttress its central and extended deterrent by completing its program of record. Finally, most participants were reticent

to articulate specific assessments of adversarial intentions and perceptions when discussing missile defense and arms control.