

★ 21ST CENTURY APPROACHES TO STRATEGIC DETERRENCE ★

# SENTRY

VOLUME 1, ISSUE 3 | NOVEMBER 2025



## FORGED. READY.

Combined Strength and Resolve

### REVITALIZING DEFENSE

Restoring Maritime  
Dominance and  
Accelerating Procurement

### BALANCING AI

Maintaining Human  
Control in Advancing  
Technology

### CALCULATED COOPERATION

Analyzing the Relationship  
Between China and Russia



A United States Coast Guard vessel escorts the Ohio-class ballistic missile submarine (SSBN) USS Maine in Puget Sound off the coast of Washington state in March 2025. These submarines, also known as boomers, provide the U.S. with its most survivable strike capability as part of the nation's nuclear triad. The SSBNs also underscore the U.S. Navy's capability to project force anywhere, anytime, as a key component of strategic deterrence. RYAN RILEY/U.S. NAVY

## WELCOME

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Dear Readers,

**W**elcome to this edition of Sentry, where our theme is “Strengthening Strategic Cooperation.” At a time when alliances are being tested and adversaries are deepening their coordination, the importance of unity among the United States and its Allies and partners has never been greater.

The world is witnessing an unprecedented level of cooperation among the Chinese Communist Party, North Korea and Russia with an increased focus on the development of nuclear weapons and adjustment of their nuclear policies and doctrines. Geopolitical alignments among Beijing, Moscow and Pyongyang are driving global instability and a heightened threat environment. These developments are deliberate signals aimed at challenging the credibility of allied deterrence, undermining democratic norms and reshaping the global security order in ways that favor authoritarian interests.

Understanding this new threat level will help the U.S. and its Allies and partners plan, operate and invest in a manner that contributes to strategic deterrence. That is why this issue is dedicated to exploring how cooperation — built on trust, interoperability and shared purpose — can provide the stability and resilience needed to meet these challenges. From Europe to the Indo-Pacific, the articles in this edition highlight the collective strength that comes from standing shoulder to shoulder. Whether through combined exercises, shared technologies or aligned policy frameworks, cooperation remains the cornerstone of effective deterrence.

Here, you will find perspectives examining the role of nuclear deterrence in today’s environment, revitalizing the defense industrial base and the value of cultivating deep ties with NATO, Japan and South Korea. We also explore how leaders infuse artificial intelligence to advance battlespace advantages while ensuring final decisions remain in human hands.

Technology plays an increasingly important role in defense, helping troops process information faster, improve situational awareness and sharpen decision-making in complex environments. These tools give commanders valuable support, but military strength rests not only on advanced technology but also on the judgment, discipline and accountability that only people can provide.

In this issue, we also look at how NATO continues to strengthen interoperability across the Alliance by aligning equipment, hardware, doctrines, processes and training. These efforts ensure that Allied forces can operate seamlessly together, whether in exercises or real-world missions. By investing in command standards and shared practices, NATO reinforces the credibility of its forces and the speed of its collective response.

As you read, we encourage you to consider not only the threats outlined but also the opportunities they present. In an era where challenges cross borders and domains, cooperation is more than a strategic advantage — it is a necessity. When the United States and its Allies act in concert, they send an unmistakable message: Together, they are prepared to safeguard peace, protect sovereignty and deter aggression.

Thank you for joining us in this important conversation. We hope this issue inspires deeper reflection, sharper dialogue and renewed commitment to the partnerships that preserve our collective security.

Regards,  
**Sentry Staff**

# SENTRY

Strengthening Strategic Cooperation

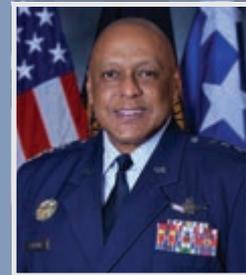
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### ABOUT THE COVER

This Sentry cover illustration symbolizes the combined strength and resolve of U.S. Allies and partners. The shield – featuring the flags of Australia, Japan, South Korea and NATO – represents the unity, resilience and shared commitment to strategic deterrence in the face of global challenges.



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## JAPAN SHOWS INTEREST IN NATO'S UKRAINE MISSION

THE ASSOCIATED PRESS

Japan has expressed interest in participating in NATO for its Ukrainian mission based in Germany, which would be a major boost in ties with the largely European Alliance.

Then-Japanese Defense Minister Gen Nakatani announced his country's interest during April 2025 talks with NATO Secretary-General Mark Rutte in Tokyo. After providing Ukraine with defense equipment and support, Japan now wants to join NATO Security Assistance and Training for Ukraine (NSATU), headquartered at a United States base in Wiesbaden, Germany.

Details of the mission, including the possibility of sending any Japan Self-Defense Forces members to Germany, are still to be discussed. Any Japanese cooperation is not expected to involve combat, in line with what has been Tokyo's post-World War II tradition of limiting its defense role.

Nakatani said Japan wants to deepen security cooperation with NATO and participation in NSATU would help Tokyo learn lessons from Russia's invasion of Ukraine.

"Both Japan and NATO face many challenges, and our security environment has become increasingly more severe," Nakatani said.

Japan has said that Russia's war on Ukraine underscores that security risks in Europe and the Indo-Pacific are inseparable, and Tokyo has sought closer ties with NATO while also joining the U.S. in expanding defense ties with other friendly

nations in the Indo-Pacific.

Rutte told Nakatani that China, North Korea and Russia are increasing their military exercises and their cooperation, which is "undermining global

security and that means what happens in Euro-Atlantic matters in the Indo-Pacific and vice versa."

Japan considers China a threat in the region and has in recent years accelerated its military buildup, including preparing to acquire strike-back capability with long-range cruise missiles. The NATO chief also raised concern about the Chinese Communist Party's arms buildup and military drills near Taiwan.

"China is supporting Russia's efforts. China is building up its armed forces, including its navy, at a rapid pace," Rutte said after a visit to Japan's advanced frigate Mogami, which was docked in the naval port of Yokosuka. "We cannot be naive, and we really have to work together [and] assess what is happening."

Rutte told Nakatani that he hoped to deepen ties between Japan and NATO in areas such as crisis response operations, cyber defense, maritime security and defense-industrial cooperation. He stressed Japan's importance in the Indo-Pacific, noting that it is the only member of the Group of 7 wealthy nations that is not in NATO.

**Then-Japanese Defense Minister Gen Nakatani meets with NATO Secretary-General Mark Rutte at NATO headquarters.**

REUTERS

# GERMANY, PHILIPPINES EXPAND DEFENSE COOPERATION

REUTERS

Germany and the Philippines agreed to enhance defense ties and boost joint activities as Manila builds up a range of alliances to strengthen its position in a long-standing dispute with China in the contested South China Sea.

Philippine Defense Secretary Gilberto Teodoro and German counterpart Boris Pistorius signed an “arrangement concerning defense cooperation” in Berlin, agreeing to expand cooperation to include cybersecurity, defense armament and logistics, and United Nations peacekeeping, Manila’s defense ministry said.

The May 2025 deal follows a 2024 visit by Pistorius to Manila, where he and Teodoro committed to boosting long-term relations between their militaries. The Philippines’ defense cooperation arrangement with Germany adds to a growing list of defense deals beyond its traditional Ally, the United States.



German Defence Minister Boris Pistorius, left, and Philippine Defense Minister Gilberto Teodoro meet before a 2024 meeting that laid the groundwork for a May 2025 defense agreement. REUTERS

In April 2025, the Philippines signed an agreement with New Zealand for expanded military cooperation, and a similar deal with Canada is expected. A reciprocal access deal with Japan was ratified in December 2024, and President Ferdinand Marcos Jr. has approved the start of negotiations with France for a visiting forces agreement.

Beijing claims almost the entire South China Sea, a vital trade artery, despite overlapping maritime claims by Brunei, Malaysia, the Philippines and Vietnam, angering its neighbors.

In 2016, the Permanent Court of Arbitration in the Hague said Beijing’s claims had no legal basis. China rejects that decision.

Pistorius said in August 2024 that the “ruling remains valid, without any exceptions.”

In September 2024, two German warships went on a rare transit in the Indo-Pacific to demonstrate Berlin’s commitment to freedom of navigation.



## FRENCH PRESIDENT URGES ALLIES TO SAY NO TO CHINA, RUSSIA

THE ASSOCIATED PRESS

French President Emmanuel Macron, in a swipe at China and Russia, urged Europe and the Indo-Pacific to form a new alliance to hold off big powers seeking to build “spheres of coercion.”

Macron’s remarks at the 2025 Shangri-La Dialogue security forum in Singapore came as Russia defies diplomatic pressure for a ceasefire in Ukraine and concerns mount about Beijing’s growing assertiveness toward Taiwan and the South China Sea.

“We have a challenge of revisionist countries that want to impose — under the name of spheres of influence — spheres of coercion,” Macron said. “Countries that want to control areas from the fringes of Europe to the archipelagos in the South China Sea ... that want to appropriate resources, whether fishing or mineral, and crowd out others for their benefit.”

Defense chiefs and officials from around the world attend the annual forum that has in recent years become a barometer of China-U.S. relations. Unusually, China did not send its defense minister but was represented by a senior officer from its People’s Liberation Army’s National Defense University.

Macron’s speech came at the end of a tour of Indonesia, Singapore and Vietnam. He urged leaders at the forum to “build a positive new alliance between Europe and Asia, based on our common norms, on our common principles.”

“Our shared responsibility is to ensure with others that our countries are not collateral victims of the imbalances linked to the choices made by the superpowers,” he said.

Macron urged China to stop its ally North Korea from sending forces to help Russia’s war in Ukraine if Beijing “doesn’t want NATO being involved in Southeast Asia or in Asia.”

He warned Indo-Pacific leaders against seeing the war in Ukraine as a distant problem.

“If we consider that Russia could be allowed to take a part of the territory of Ukraine without any restriction, without any constraint, without any reaction of the global order, how would you phrase what could happen in Taiwan?” he asked. “What would you do the day something happens in the Philippines?”

A Filipino Marine on the Philippines island of Thitu monitors a China Coast Guard ship in the disputed South China Sea.

AFP/GETTY IMAGES

# U.S. tells Indo-Pacific Allies: **WE'VE GOT YOUR BACK**

— THE ASSOCIATED PRESS —

**U**nited States Secretary of War Pete Hegseth reassured Allies in the Indo-Pacific that they will not be left alone to face increasing military and economic pressure from China.

He said Washington will bolster its defenses overseas to counter what U.S. military leaders describe as rapidly

developing threats by the Chinese Communist Party (CCP), particularly in its aggressive stance toward Taiwan. The CCP has conducted numerous exercises to assess a blockade of the self-governing island, which Beijing claims as its own and the U.S. has pledged to defend.

The People's Liberation Army is "rehearsing for the real deal," Hegseth said in a keynote speech at the 2025 Shangri-La Dialogue, a global security forum in Singapore. "We are not going to sugarcoat it — the threat China poses is real. And it could be imminent."

The CCP has a stated goal of ensuring its military can take Taiwan by force if necessary by 2027, a deadline that experts view as more of an aspirational goal than a hard deadline.

Speaking in May 2025 at the forum, Hegseth committed to bolstering the U.S. military in the Indo-Pacific to provide a more robust deterrent. He also stressed the need for U.S. Allies and partners to increase defense spending and preparations.

"Ultimately, a strong, resolute and capable network of Allies and partners is our key strategic advantage," Hegseth said. "China envies what we have together, and it sees what we can collectively bring to bear on defense, but it's up to all of us to ensure that we live up to that potential by investing."

**Malaysian Prime Minister Anwar Ibrahim, right, meets U.S. Secretary of War Pete Hegseth at the Shangri-La Dialogue in Singapore.**

ALEXANDER KUBITZA/U.S. DEPARTMENT OF WAR





# NEW ZEALAND KEEN TO INCREASE DEFENSE CONTRIBUTIONS

REUTERS

**NEW ZEALAND** wants to expand Indo-Pacific military deployments to show it is “pulling our weight” with increased spending on its armed forces, the South Pacific nation’s top military official said.

Defence Minister Judith Collins raised the prospect of welcoming increased warship visits to the country, deepening combined training and other cooperative efforts with its traditional defense partners, including Australia, Japan, the Philippines, Singapore, the United Kingdom and the United States.

“So, we’re open for business, we’re back in the world, and we’re pulling our weight,” Collins said in late May 2025 at the Shangri-La Dialogue security forum in Singapore.

The New Zealand government announced in April 2025 that it would boost defense spending by \$5 billion during the next four years, with the aim of nearly doubling it to 2% as a share of gross domestic product in the next eight years amid growing international tensions. The new spending significantly boosts the defense budget and follows its first national security review in 2023.

The review called for more military spending and stronger ties with Indo-Pacific nations to tackle issues such as strategic competition between the West and China and Russia.

The USS Blue Ridge, the command ship of the U.S. Pacific Fleet, visited Wellington in May 2025 and further

visits from partners could be expected, Collins said. The Blue Ridge was just the third U.S. warship to visit in 40 years.

When asked about Chinese concerns at New Zealand’s more

assertive military posture, Collins said Beijing realized that Wellington had “actually got a spine,” but doesn’t “think China stays awake at night worrying about us.”

Military analysts say that New Zealand must improve its ability to sustainably project power given its small, aging Air Force and Navy. New Zealand maintains an independent foreign policy but remains part of the Five Eyes intelligence-sharing network with Australia, Canada, the U.K. and the U.S.

Deployments of its four new Boeing P-8A Poseidon maritime patrol aircraft are being closely watched, given how they can help other countries plug gaps in the hunt for Chinese submarines, analysts say.

Collins said New Zealand and Australian pilots now can fly each other’s P-8 and transport planes — a sign of growing interoperability. Collins said the P-8s already had flown toward Canada, and she expects further patrols in the South China Sea and Indian Ocean. “I think you’ll see quite a lot of that,” she said. “We go everywhere. Everywhere where we’re wanted, we go, if we can.”

**A Boeing P-8A Poseidon maritime patrol aircraft of the Royal New Zealand Air Force**

NEW ZEALAND DEFENCE FORCE

# STRENGTHENING STRATEGIC COOPERATION



British destroyer HMS Dauntless, left, and Norwegian frigate HNoMS Roald Amundsen dock at a Japan Maritime Self-Defense Force base in eastern Japan in August 2025. REUTERS

# Allies and partners scale deterrence through a shared vision of stability

SENTRY

**T**oday's complex global landscape demands robust and effective strategic cooperation among like-minded Allies and partners who value a stable and open international system. The United States, NATO and Indo-Pacific Allies and partners have never been more focused on maintaining peace as China, Iran, North Korea and Russia increase their attempts to disrupt the international world order.

"Today, our region and the broader international community confront challenges of an unprecedented magnitude. The need for frank and open dialogue among defense leaders has never been greater," Japan's then-Minister of Defense Gen Nakatani said in May 2025 at the Shangri-La Dialogue defense forum. "Competition among nations is intensifying, growing ever more complex and extending across domains. And this is happening very rapidly. In these times, it is incumbent upon us to address the root causes."

Efforts to scale deterrence include enhancing interoperability among Allies, integrating artificial intelligence (AI) into nuclear forces and upscaling alliances through combined training on advanced technologies that improve battlespace awareness and accelerate decision-making.

Stability hinges on mitigating regional tensions through diplomatic engagements and fostering mutual trust. Strengthening international institutions and Alliances such as NATO, promoting transparency in military activities and adhering to international laws can help reduce misunderstandings and prevent escalations.

"The reality is that peace and stability are still burning



**U.S. Navy destroyer USS Bulkeley launches a missile to intercept a ballistic missile during exercise Formidable Shield in May 2025.**

JONATHAN NYE/U.S. NAVY

By demonstrating the ability to respond swiftly and effectively, Allies make it clear that any act of aggression will be met with decisive and overwhelming force.



Allied fighter jets participating in NATO exercise Ramstein Flag fly in formation over the west coast of Greece. More than 130 fighter and enabler aircraft from Canada, France, Greece, Hungary, Italy, Poland, Portugal, Romania, Spain, Sweden, the United Kingdom and the United States trained side by side to improve tactics and foster more robust integration, demonstrating NATO's resolve, commitment and ability to deter potential adversaries and defend the Alliance.

EMILI KOONCE/U.S. AIR FORCE

Japan Maritime Self-Defense Force Sailors conclude a passing exercise in the Eastern Mediterranean with NATO forces to improve interoperability. NATO



aspirations in many places around the world, areas where conflicts and wars have occurred, threatening and taking away human lives and the peace and happiness of the people,” Vietnamese Minister of National Defence Gen. Phan Van Giang said during the Shangri-La Dialogue. “Ensuring stability in a competitive world is a prerequisite and indispensable condition for building a world of peace, stability, cooperation and development for the common interests of nations and peoples, and at the same time, it is an urgent requirement today.”

### ***Investing in Deterrence***

Deterrence remains a cornerstone of international security, serving as a critical mechanism to prevent aggression by making the cost of hostile actions unacceptably high for potential adversaries. Increasing deterrence efforts involves not only modernizing defense capabilities but also ensuring a unified and credible response to any threat.

For NATO and its Indo-Pacific Allies and partners, this means investing in advanced defense technologies, fortifying missile defense systems and enhancing rapid deployment capabilities. By demonstrating the ability to respond swiftly and effectively to threats, these alliances send a clear message that any act of aggression will be met with decisive and overwhelming force. This is particularly important in deterring state actors who may seek to exploit perceived weaknesses in the international security architecture.

To that end, NATO’s top civilian official has said the world can expect to see it become “more lethal” while remaining a defensive Alliance. “Becoming more lethal means strengthening our deterrence and defense posture.

Providing our militaries with what they need to keep us safe. And showing any aggressor, we can, and will, hit back harder,” NATO Secretary-General Mark Rutte said in the United Kingdom in June 2025 during a speech on building a better NATO. “With our military power, and our resolve to use it, if necessary, no one should even think about attacking us.”

### ***Enhancing Interoperability***

Interoperability — the ability of different military forces to work seamlessly together — is a critical factor in the effectiveness of multinational coalitions. As NATO and Indo-Pacific Allies and partners operate in ever more integrated and complex environments, ensuring that their forces can communicate, integrate and operate together is paramount.

During an April 2025 meeting, Rutte and then-Japanese Prime Minister Shigeru Ishiba called the partnership between NATO and Japan one of strategic importance for the Euro-Atlantic and Indo-Pacific regions. “We recognize



A Royal Air Force A-330 Voyager refuels Eurofighter Typhoons during exercise Ramstein Flag in England in 2025. JESENIA LANDAVERDE/U.S. AIR FORCE

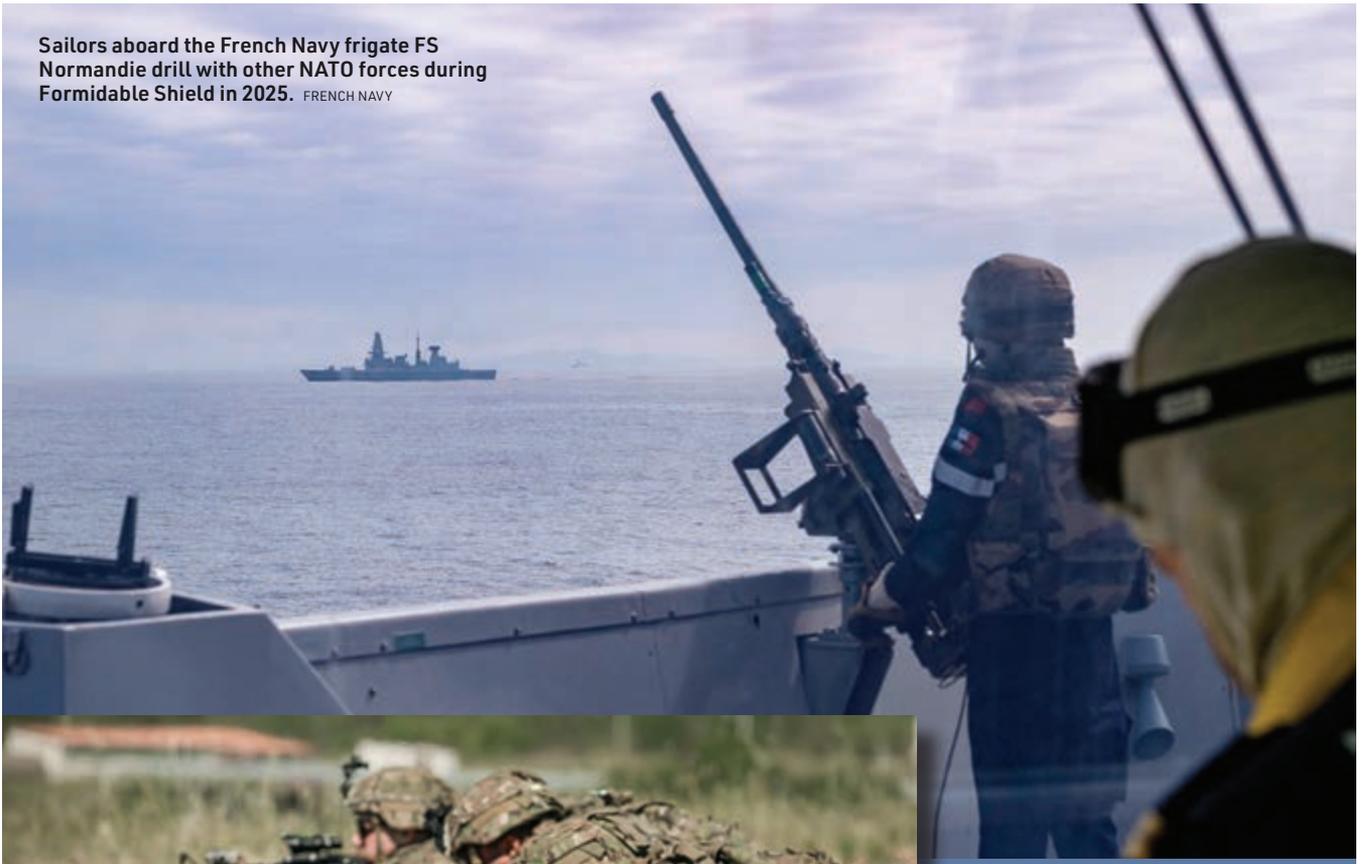
“Becoming more lethal means strengthening our deterrence and defense posture. Providing our militaries with what they need to keep us safe. And showing any aggressor, we can, and will, hit back harder.”

- **Mark Rutte**, NATO Secretary-General



**NATO Ally ships participate in a passing exercise during a Formidable Shield demonstration. The exercise enhances Allied interoperability in live-fire, integrated air and missile defense using NATO command and control reporting structures.** FRENCH NAVY

Sailors aboard the French Navy frigate FS Normandie drill with other NATO forces during Formidable Shield in 2025. FRENCH NAVY



Greek and U.S. troops secure a landing zone during exercise Immediate Response 2025 in Greece. THEODOSIUS SANTALOV/U.S. ARMY

that the security of the Euro-Atlantic and the Indo-Pacific are interconnected, and that we face many of the same challenges,” Rutte and Ishiba said in a joint statement following their meeting in Tokyo. “We share the belief that in a changing and uncertain security environment, continuing Japan-NATO cooperation will benefit the security and resilience of the Euro-Atlantic and the Indo-Pacific regions.”

Enhancing interoperability involves standardizing equipment, communication protocols and operational procedures across allied forces. This can be achieved through joint training exercises, shared technological solutions, and the development of common doctrines and strategies.

By improving interoperability, allied forces can maximize their collective capabilities, respond more effectively to crises and maintain a unified front against common threats.

“Today, our cooperation is extensive, focusing on challenges that can impact the security of Japan and NATO,” Rutte and Ishiba added. “With the steady development of our partnership, we are taking steps to

increase our ability to address these challenges in our respective regions, through our strategic cooperation in areas like cyber defense, space, emerging and disruptive technologies, and interoperability.”

U.S. Secretary of War Pete Hegseth reiterated the United States’ commitment to deterrence during his remarks at the Shangri-La Dialogue in May 2025, noting that the United States is an Indo-Pacific nation and will continue to be one “for generations to come.”

“The United States is committed to achieving peace through strength,” he said. “That starts with deterring aggression around the world and here in the Indo-Pacific, here in our priority theater, here with you — our Allies and partners. The United States stands ready to work with any country that is willing to step up and preserve the global and regional peace that we all hold dear.” ★

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# 'STRONG ALLIANCE' CRUCIAL TO DEFENSE

A Japanese general discusses his nation's  
view of deterrence

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SENTRY

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A Japan Maritime Self-Defense Force ShinMaywa US-2 seaplane takes off from the U.S. Marine Corps Air Station in Iwakuni, Japan. DAVID GETZ/ U.S. MARINE CORPS



**J**apan Ground Self-Defense Force Lt. Gen. Nobutaka Minamikawa, Chief of Staff for the Japan Self-Defense Force Joint Operations Command, spoke with Sentry during the 2024 United States Strategic Command Deterrence Symposium in Omaha, Nebraska. He talked about a Free and Open Indo-Pacific, Japan's engagement with regional partners, and the importance of the Japan-U.S. alliance to ensure deterrence. At the time of his interview, Nobutaka was a major general serving as Japan Joint Staff, Director General Defense Plans and Policy Department. He has since been promoted.

#### **SENTRY: Why is deterrence important for Japan?**

**NOBUTAKA:** As Russia's aggression against Ukraine attests, the international community is facing the greatest challenges since the end of World War II and has entered a new era of crisis. Given [that], we cannot rule out the possibility of serious events taking place in East Asia in the future, which might undermine the foundation of the stable postwar international order.

The People's Republic of China (PRC) is extensively and rapidly increasing its military capability, including nuclear and missile forces, and is continuing and intensifying its unilateral attempts to change the status quo by force or coercion in the East China Sea and the South China Sea. In addition, [the ] PRC has been intensifying its coercive military activities around Taiwan.

North Korea has repeatedly launched ballistic missiles and [other weapons] at a high frequency in recent years and has been rapidly advancing its nuclear and missile development programs.

Furthermore, Russia, while conducting aggression against Ukraine, has strengthened military cooperation with the PRC near Japan, such as joint navigations of naval vessels, joint flights of bombers and various training exercises.

Thus, in the face of the most severe and complex security environment of the postwar era, in order to defend Japan to the end in every situation, it is important to further enhance deterrence and response capabilities of Japan and the Japan-U.S. alliance, including through fundamental reinforcement of Japan's defense capabilities and further strengthening extended deterrence.

#### **SENTRY: What are the main elements of Japan's deterrence posture?**

**NOBUTAKA:** [They are] reinforcing Japan's deterrence posture through its own efforts; extended deterrence by the U.S. backed by the full range of capabilities, including nuclear weapons; and close coordination between Japan Self-Defense Forces and the U.S. forces. Japan's counterstrike capabilities with its future standoff defense capabilities and other capabilities will enhance Japan's defense capabilities.



A member of the U.S. Air Force Honor Guard Drill Team demonstrates techniques to a cadet from the National Defense Academy Honor Guard Drill Team during a visit to the academy in Yokosuka, Japan, in April 2025. YASUO OSAKABE/U.S. AIR FORCE



An F-35 fighter on display during an aircraft-delivery ceremony at Japan's Komatsu Air Base in April 2025. Japan received its first three F-35 warplanes, marking a historic milestone for the Japan Air Self-Defense Force. JAPAN AIR SELF-DEFENSE FORCE

Additionally, U.S. extended deterrence, with nuclear deterrence at its core, is essential. Furthermore, it is important to ensure that these capabilities of the two countries are closely coordinated. In this way, I believe that Japan's deterrence is enhanced through a combination of Japan's own efforts and U.S. extended deterrence.

**SENTRY: What are the main challenges and opportunities for Japan's deterrence in the Indo-Pacific region?**

**NOBUTAKA:** The strong alliance between Japan and the U.S. is a major advantage. Continuing to convey the message at all opportunities and levels that the Japan-U.S. partnership is strong will further ensure deterrence. One of the challenges for the future will be to ensure that our standoff defense capabilities ... continue to develop and operate as planned. As strategic attacks are not limited to nuclear weapons in recent days, I believe that the importance of initiatives in the field of conventional weapons is increasing.

**SENTRY: How does Japan cooperate with the U.S. as its Ally and other nations to enhance strategic deterrence in the region?**

**NOBUTAKA:** In dealing with the threat of nuclear weapons, U.S. extended deterrence, with nuclear deterrence, is essential. In addition, by utilizing our fundamentally reinforced defense capabilities, we can expect to contribute to a more effective demonstration of U.S. capabilities, and further reinforce the deterrence and response capabilities of the Japan-U.S. alliance. I also believe that it is extremely important to reinforce cooperation — not only with our Ally, the U.S. — but also with like-minded countries to enhance our nation's defense capabilities.

**SENTRY: How does Japan's role in maintaining a Free and Open Indo-Pacific extend to the global stage?**

**NOBUTAKA:** The security environments of the Indo-Pacific region and the Euro-Atlantic region [are] now inseparable. I believe that reinforcing Japan's deterrence capabilities in the Indo-Pacific and strengthening its cooperation with the U.S., like-minded countries and partners, including Australia and NATO member states, will contribute to global peace and stability.

**SENTRY: What is Japan doing to expand its relationship with the U.S.?**

**NOBUTAKA:** The U.S. is Japan's only Ally. [The] Japan-U.S. alliance is the cornerstone for Japan's security policy, and we are further strengthening deterrence and response capabilities of the alliance through various fields of cooperation.

**SENTRY:** What countries would you like to work with more, or what countries are you currently working with to increase your deterrence capabilities?

**NOBUTAKA:** I believe it is important to reinforce cooperation not only with our Ally the U.S. but with like-minded countries to enhance deterrence. Japan is reinforcing cooperation with countries in the Indo-Pacific region as well as with European countries.

**SENTRY:** How does Japan address the challenges posed by emerging technologies in the context of strategic deterrence?

**NOBUTAKA:** Rapidly advancing technologies, including artificial intelligence and next-generation information and communications technologies, could change the characteristics of future warfare. In such a case, the deterrent capabilities of conventional defense forces could decline. Under these circumstances, we will actively and constructively participate in relevant discussions and international rulemaking, and [we] must maintain and enhance our deterrence capabilities by making equipment incorporating the latest technologies available for practical use as soon as possible to fundamentally reinforce defense capabilities, and by enhancing our resilience in various domains, such as the cyber domain.

“ THE SECURITY ENVIRONMENTS OF THE INDO-PACIFIC REGION AND THE EURO-ATLANTIC REGION [ARE] NOW INSEPARABLE. I BELIEVE THAT REINFORCING JAPAN’S DETERRENCE CAPABILITIES IN THE INDO-PACIFIC AND STRENGTHENING ITS COOPERATION WITH THE U.S., LIKE-MINDED COUNTRIES AND PARTNERS, INCLUDING AUSTRALIA AND NATO MEMBER STATES, WILL CONTRIBUTE TO GLOBAL PEACE AND STABILITY.”



Japan Ground Self-Defense Force helicopters transport personnel, vehicles and artillery during a combined exercise with Allies at Camp Narashino, east of Tokyo. AFP/GETTY IMAGES

**SENTRY: How does Japan balance its defense capabilities with its commitment to peace and disarmament?**

**NOBUTAKA:** Under the Japanese Constitution, Japan has built a highly effective joint defense force in line with the basic principles of maintaining an exclusively defense-oriented policy and not becoming a military power that poses a threat to other countries. We firmly maintain the Japan-U.S. Security Arrangements, adhering to the principle of civilian control of the military and observing the Three Non-Nuclear Principles: not possessing, not producing and not permitting the introduction of nuclear weapons. In this effort, we are paying attention to our transparency. Furthermore, I believe that Japan's effective defense capabilities will contribute to deterrence, which in turn will contribute to regional peace and stability.

**SENTRY: How does Japan's strategic deterrence posture address the threat of cyberattacks?**

**NOBUTAKA:** In order to deter malicious cyber activities and protect the people's safety and rights, Japan will continue to have close coordination with our Ally and like-minded countries

from peacetime and will take resolute responses against cyber threats, including those possibly sponsored by states, utilizing political, economic, technological, legal, diplomatic and all other viable and effective means and capabilities. In this regard, it was confirmed in the Japan-U.S. "2+2" [meeting] in April 2019 that a cyberattack could, in certain circumstances, constitute an armed attack under Article V of the Japan-U.S. Security Treaty. Since cyberattacks have the risk of rapidly developing into a graver situation, Japan will quickly respond to incidents by seamlessly transitioning throughout the process of escalation — from peacetime to large-scale cyberattacks and then to armed attacks. In addition, Japan will continue to maintain and strengthen the deterrence of the Japan-U.S. alliance.

**SENTRY: How does Japan's defense policy address the issue of arms control and nonproliferation?**

**NOBUTAKA:** The proliferation of weapons of mass destruction and missiles that could be used to deliver them — as well as the proliferation of weapons and dual-use goods and sensitive technologies that can be diverted to military use — is an imminent issue for the peace and stability of the international

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**A Japan Ground Self-Defense Force paratrooper listens to a briefing before boarding a plane at Yokota Air Base, Japan.**

NATALIE DOAN/U.S. AIR FORCE





**A Japan Ground Self-Defense Force aircraft transports troops, vehicles and artillery during a combined exercise with Allies at Camp Narashino, east of Tokyo.** AFP/GETTY IMAGES

community. Japan's National Security Strategy identifies arms control, disarmament and nonproliferation, including weapons of mass destruction, as one of the important measures among efforts to reinforce a free and open international order. The National Defense Strategy reflects Japan's readiness to contribute to the improvement of the effectiveness of international organizations and multilateral export-control regimes. It also states that Japan will play an active role in international initiatives for arms control, disarmament and nonproliferation.

**SENTRY:** How do we make advances in integration in a world that is seemingly so fractured at the moment?

**NOBUTAKA:** Japan shares with other countries the values of maintaining international order based on the rule of law, and from the perspective of proactive contribution bound to international cooperation, Japan must actively participate in efforts to resolve conflicts and confrontations around the world, provide humanitarian assistance and disaster relief in the event of large-scale international disaster caused by climate change and other factors and address international challenges such as the nonproliferation of weapons of mass destruction. Japan and the U.S. must work together as Allies with shared values based on democracy to meet these challenges.

**SENTRY:** What strategic deterrence or defense capabilities are you extremely proud of, and what areas are you working on to improve?

**NOBUTAKA:** As I mentioned earlier, in terms of deterrence, I believe that Japan's fundamental reinforcement of defense

capabilities, extended deterrence by the U.S., and close coordination between Japan and the U.S. will become important. In terms of fundamentally reinforced defense capabilities, Japan has been working to reinforce the following areas: 1) standoff defense capabilities, 2) integrated air and missile defense capabilities, 3) unmanned defense capabilities, 4) cross-domain operations capabilities, 5) command and control and intelligence-related functions, 6) mobile deployment capabilities and civil protection, and 7) sustainability and resiliency.

**SENTRY:** What role does soft power play in the development of strategic defense planning and what does it look like when applied?

**NOBUTAKA:** Deterrence plays an important role in the formulation of strategic defense plans. Deterrence is achieved by having our target recognize our desirable end states and make them realize that preventing the end states does not contribute to the target's interest. We believe that the use of soft power is effective in maintaining deterrence. Specifically, we believe that we can make our deterrence better by informing the international [community] of various activities by the Ministry of Defense and the Self-Defense Forces, their purposes and the international confidence in us, coordinating with [our Ally] and like-minded countries.

# ARSENALS OF DEMOCRACY

*Allies and partners look to build up  
maritime industry*

SENTRY

**U**nited States President Franklin D. Roosevelt told a national radio audience on December 29, 1940, that the U.S. must come to the aid of a Great Britain under siege from Adolf Hitler's bombers and become the "great arsenal of democracy." A little less than a year later, the U.S. would be at war, and its industry — mobilized from commercial to military production — would become that arsenal.

Now, the U.S. is again taking decisive action to expand its defense industrial base (DIB), develop advanced weapons systems and confront global challenges that threaten a stable and open international system, including Russia's ongoing war in Ukraine and an increasingly confrontational Chinese Communist Party (CCP) in the Indo-Pacific.

With executive orders issued in April 2025, U.S. President Donald Trump directed the government to accelerate the pace of military procurement and boost the DIB, as well as make it a priority to restore the nation's maritime dominance and streamline foreign defense sales. The orders came in the wake of a March 2025 speech in which President Trump announced the creation of an Office of Shipbuilding within the White House. His remarks made clear that maritime production is crucial to the revitalization of the DIB. "We are ... going to resurrect the American shipbuilding industry," he said, "including commercial shipbuilding and military shipbuilding."

The U.S. government also has proposed a \$1 trillion defense budget for fiscal year 2026. Its priorities include the funding of the proposed Golden Dome for America

air defense system, nuclear enterprise modernization and building more ships and nuclear submarines.

U.S. Air Force Gen. Anthony Cotton, Commander of U.S. Strategic Command (USSTRATCOM), said a robust DIB is essential to modernizing and maintaining the U.S. nuclear triad of land-based intercontinental ballistic missiles, strategic bombers and nuclear-armed submarines. The Columbia-class ballistic missile submarine (SSBN) program is a modernization priority for USSTRATCOM and the U.S. Navy. The Navy plans to replace the current Ohio-class submarines with 12 Columbia-class boats. The SSBN fleet is the most survivable leg of the triad.

Gen. Cotton has advocated for raising the base production of the B-21 Raider strategic bomber, upgrading the existing B-52 fleet and maintaining availability of existing Ohio-class submarines while production of its Columbia-class replacements gets up to speed.

"A healthy industrial base that can provide advanced technology, capability and capacity on time is fundamental to our ability to compete strategically," he told the U.S. Senate Armed Services Committee in March 2025.

One example of the administration's focus on a healthy DIB came in July 2025 when Aerojet Rocketdyne opened a new and expansive rocket propulsion plant in the U.S. state of Alabama. "When you hear senior leaders across the nation talking about increasing capacity, increasing throughput, increasing missile and munition inventory levels; when you hear people talking about getting on a war footing, understanding the threats and the



adversaries that we face on a daily basis; when we talk about all of these things, this is the manifestation of that outcome,” U.S. Army Maj. Gen. Frank Lozano, the U.S. Army’s program executive officer for missiles and space, said at an opening ceremony for the facility, according to DefenseNews.

Experts say the U.S. also can address the DIB through steps such as those outlined in President Trump’s executive orders, as well as through manufacturing and technology collaborations with Allies such as Japan and South Korea.

### BEIJING’S EXPANSION

China’s current defense industrial production indicates that the CCP is on a “wartime footing,” according to Seth Jones of the Center for Strategic and International Studies and co-author of the 2024 report *Rebuilding the Arsenal of Democracy*.

“That doesn’t mean war is imminent, per se, but what it means is they are building the capabilities to conduct a war, and a war in particular with the United States,” Jones said on a March 2024 episode of “The Truth of the Matter” podcast.

The U.S. Navy, according to a January 2025 report by the Congressional Budget Office (CBO), has 295 battle-force ships but seeks to increase its fleet to 390 by

2054. However, the CBO notes that the fleet will shrink first because of planned ship retirements that will drop its size to 283 in 2027. The Defense One news website reported in March 2025 that the U.S. has a “significant backlog” in the production of warships and nuclear submarines. Only four public shipyards in the country maintain Navy ships, according to a February 2024 story by the U.S. Naval Institute. (The Navy had 11 public shipyards at the end of World War II.)

A May 2025 commentary by analysts Miyeon Oh and Michael Cecire at the Rand Corp. think tank offered further context for the U.S. executive orders: China accounts for about 50% of the world’s output of commercial vessels, with South Korea second (30%) and Japan third (10%). “The United States, meanwhile, accounts for less than 1% of the global shipbuilding market,” the analysts said. U.S. Navy Secretary John Phelan, during his Senate confirmation hearings, said of that imbalance: “The

president has been very consistent when he spoke with me: shipbuilding, shipbuilding, shipbuilding.”

To address that challenge, the Restoring America’s Maritime Dominance executive order includes:

- A whole-of-government strategy to rebuild U.S. shipbuilding and maritime infrastructure.

**“THE PRESIDENT HAS BEEN VERY CONSISTENT WHEN HE SPOKE WITH ME: SHIPBUILDING, SHIPBUILDING, SHIPBUILDING.”**

— John Phelan, U.S. Navy Secretary



The Ohio-class ballistic missile submarine USS Maine transits Puget Sound, Washington, in March 2025. RYAN RILEY/U.S. NAVY

- Financial incentives to boost private investment in U.S. shipyards.
- Expansion of shipbuilding capabilities and parts supply chains.
- Greater investment in workforce training to recruit and retain skilled maritime professionals.

Defense analysts say a pragmatic approach will help accomplish such goals. A May 2025 report from the Atlantic Council cautioned against the tendency to “exaggerate or overstate” the Chinese maritime threat. The report noted that the U.S. Navy still holds the advantage in several areas — such as vertical missile launchers, destroyers, nuclear aircraft carriers and nuclear attack submarines. “Within range of its land-based missile systems, China is a dangerous opponent. In blue water, the United States and its Allies are far more capable,” wrote Richard Hooker Jr., author of the report. Smaller coastal patrol ships make up much of the People’s Liberation Army Navy (PLAN) fleet, according to the report. The World Directory of Modern Warships and Submarines, while noting PLAN’s numerical edge, ranked the U.S. first in its “TrueValueRating,” which uses metrics such as “modernization, logistical support, and attack and defense capabilities.”

Still, as Phelan told a U.S. House defense subcommittee in May 2025: “We need to get hulls in the water.”

## ALLIES AND PARTNERS

If the U.S. is to launch those hulls, then Allies and partners will play integral roles, whether through shipbuilding expertise, shared research and development (R&D), or tech collaborations. Analysts say that working with Japan and South Korea on shipbuilding makes sense because the U.S. needs to be able to produce ships more quickly — for both military and commercial purposes.

The Rand think tank, in a May 2025 commentary, said that South Korean shipyards, including Hyundai Heavy Industries (HHI) and Hanwha Ocean, possess “efficient mass production techniques that allow for the rapid delivery of high-quality warships, with expertise in modular construction and advanced ship design. In 2024, for example, HHI delivered the Aegis destroyer Jeongjo the Great to the Republic of Korea (ROK) Navy. The Wall Street Journal newspaper, in a video report on HHI’s shipyard in Ulsan, put the cost of building the warship at \$600 million, which it said is a billion dollars less than what the vessel would cost if built in the U.S. The ROK destroyer was built in 18 months at Ulsan, which is the world’s largest shipyard, according to the Journal. In the U.S., it would have taken 28 months to build the vessel, the report said. U.S. law, however, prevents the Navy from buying ships or building “major component[s] of the hull or superstructure” for them from a “foreign shipyard.”

Phelan visited Japan and South Korea, toured their shipyards, and met with defense officials and maritime industry leaders on an Indo-Pacific trip in late April 2025. He told the news magazine *Nikkei Asia* ahead of his trip that cooperation with Allies is essential. “We aim to revive the U.S. shipbuilding industry by joining forces

with [South] Korea, ranked second globally [in ship production], and Japan, ranked third,” Phelan told *Nikkei Asia*. During his trip, Phelan also called for deeper cooperation with South Korea in naval ship maintenance, repair and overhaul (MRO), encouraging their shipyards to bid on more overhauls of U.S. Navy ships. “South Korean shipyards are conducting [MRO] of U.S. Navy



ships in South Korea, and have invested in American shipyards,” he told the Yonhap News Agency. “I am extremely impressed with South Korea’s shipbuilding capabilities, and my visits to HD Hyundai Heavy Industries and Hanwha Ocean shipyards have only served to reinforce this.”

Huntington Ingalls Industries, the largest U.S. naval shipbuilder, reached an agreement in April 2025 to partner with HHI on accelerating ship production in support of defense and commercial projects. Hanwha Ocean, which already has a portfolio of U.S. Navy-related projects, acquired Philly Shipyard in Philadelphia in 2024. “In order to remain the world’s dominant maritime power, we must increase capacity to both build new ships and conduct maintenance,” Phelan said. “It is my hope that shipyards in South Korea will play a crucial role in helping revitalize America’s maritime industrial base through foreign direct investment and sharing best practices.”

The Japanese shipyards, such as Mitsubishi Heavy Industries, also have “world-class expertise in naval engineering and systems integration, which allow them to build some of the most advanced destroyers and submarines in the world,” according to Rand. In the first stop on his trip, Phelan toured Japan Marine United’s Isogo Works shipyard and met with then-Defense Minister Gen Nakatani, according to the *Stars and Stripes* newspaper. Phelan encouraged Japanese officials to consider investing in U.S.-based joint ventures, pointing to Hanwha Ocean’s acquisition of the Philadelphia shipyard as an example, *Stars and Stripes* reported.

**U.S. Navy Secretary John Phelan greets crew members of the fast attack submarine USS Iowa during a commissioning ceremony in Groton, Connecticut, in April 2025.**

JOSHUA KARSTEN/U.S. NAVY

## A FEW OF THE OTHER 2025 DEFENSE EXECUTIVE ORDERS:

**Modernizing Defense Acquisitions and Spurring Innovation in the Defense Industrial Base** states that the U.S. “must deliver state-of-the-art capabilities at speed and scale through a comprehensive overhaul of this system.” It prioritizes “speed, flexibility and innovation” in acquisitions while seeking to “incentivize and reward risk-taking and innovation” from the defense acquisition workforce.

**Reforming Foreign Defense Sales to Improve Speed and Accountability** seeks to reduce regulatory burdens and foster collaboration between government and industry. The order says that reforming the system will strengthen U.S. Allies’ capabilities and “allied burden-sharing” while boosting U.S. supply chains, production and technology development. It also calls for the granting of “simultaneous certifications and approvals” to speed sales.

Shipbuilding collaborations could also extend to uncrewed vessels. Joshua Tallis, a principal research scientist at the Center for Naval Analyses, wrote in an April 2025 commentary for DefenseNews that pairing U.S. startups in defense tech with Allies could enable the mass production of autonomous vehicles across all domains. “Much like an iPhone says on the back, ‘Designed by Apple in California, Assembled in China,’ it is possible to envision a[n] ... unmanned surface vessel with the stamp: ‘Designed in Texas, Assembled in Yokohama,’” Tallis wrote.

### AUKUS

Australia, the United Kingdom and the U.S. created a security partnership in 2021 known as AUKUS, which seeks to boost the submarine industrial base (SIB) of the three nations as well as commit to a “peaceful, secure and stable” Indo-Pacific region. The U.S. Department of War (DOW) is currently reviewing the agreement.

Pete Hegseth, the U.S. Secretary of War, said during talks with Australian Defense Minister Richard Marles at the Pentagon in February 2025 that AUKUS “has to be [supported by] robust Allies and partners. Technology sharing and subs are a huge part of it,” according to the DOW. Still, in a July 2025 social media post, the DOW announced a Hegseth-directed review of the initiative. “As part of this process, the [DOW] looks forward to continuing regular engagements on

this important matter with other parts of the U.S. government, the U.S. Congress, our Allies Australia and the United Kingdom, and other key stakeholders. The department anticipates completing the review in [late 2025]. Its purpose will be to provide [President Trump] and his senior leadership team with a fact-based rigorous assessment of the initiative.”

The initial AUKUS goals, according to the DOW, included fostering “deeper integration of security and defense-related science, technology, industrial bases and supply chains.” The first AUKUS initiative, Pillar 1, is a commitment to support Australia in acquiring nuclear-powered submarines. In 2023, a deal was reached for Australia to buy at least three U.S.-built Virginia-class attack submarines within 10 to 15 years. The plan also calls for a new generation of subs, SSN-AUKUS, to eventually be built in Australia with British and U.S. help.

In May 2025, Hegseth and Marles met during a security forum in Singapore, where they discussed the need to significantly lift U.S. submarine production rates to meet AUKUS targets, Reuters reported. In July 2025, Australia made a second payment (\$525 million) to the U.S. under an AUKUS deal in which Canberra pays \$3 billion to boost the capacity of the shipyards that build U.S. submarines, according to Reuters. The investment also includes funds for U.S. workers to help Australia establish its own SIB and for Australians to work in U.S. shipyards.

Marles, in a statement after Australia made its initial payment of \$500 million in February 2025, said the investment is about his country “paying its way when it comes to AUKUS by helping to uplift the U.S. SIB so that Virginia-class submarines are available to be [built and] transferred to Australia.” The submarine deal could cost Australia up to \$368 billion over the next three decades, according to the Australian Broadcasting Corp.

Meganne Atkins, executive director of the U.S. Navy AUKUS Integration and Acquisition (I&A) program office, discussed the partnership’s strategy at the Naval Submarine League’s Annual Symposium and Industry Update in November 2024. It’s a “rising tides lift all boats mentality on our industrial base, so that we have multiple organizations that are able to support multiple classes of submarines across the entire AUKUS, from our U.S. Virginia class to our Australian Virginia class to our SSN-AUKUS in the future,” she said, according to National Defense magazine.

In March 2025, U.S. multinational corporation Honeywell announced that it had won a contract awarded by the nonprofit BlueForge Alliance on behalf of AUKUS I&A to set up a pilot program through which Australian companies can support the production, sustainment and operational readiness of Virginia-class submarines, according to Australian Defence Magazine. BlueForge Alliance is one of the DOW’s “unconventional efforts to





use third parties to kick the nation's submarine-building industry into a higher gear," according to a September 2024 report by Defense News.

Analysts say that AUKUS partners can ease U.S. submarine production pressures through shared R&D, training and supply chain investment.

U.S. Navy Adm. Bill Houston, who directs the U.S. Navy's Nuclear Propulsion Program, said AUKUS will help the submarine building of the U.S. as well as those of Australia and the U.K. "Those Allies and partners, they are bringing capabilities to us," he said at the symposium, according to National Defense magazine. Houston said that commonality is key to AUKUS, because developments born in isolation among the three Allies are hugely expensive and time-consuming, according to National Defense magazine. (Commonality also extends to personnel. In April 2025, the first enlisted Sailors from the Royal Australian Navy graduated from the U.S. Navy's Nuclear Power Training Unit.) "The United States has done low-rate production in the past, Houston said, according to the magazine, "but we need to now capitalize on international, large, broad capabilities, which are common on all platforms."

Eric Lies, writing in online journal The National Interest, said that "integrating the three AUKUS countries' military-industrial complexes and collaborating on research and development will improve the economic opportunities available to the United States." Lies said

demand for U.S. expertise in submarine construction will last for decades under Pillar 1, but that the wide-ranging research and development shared under Pillar 2 will include, for example, artificial intelligence, autonomous vehicles and hypersonic missiles. In addition, both Japan and South Korea have been consulted on areas of collaboration under Pillar 2, according to The National Interest.

### BUILD ON ADVANTAGES

The revitalization of the U.S. defense industrial base — especially its maritime industry — will require action across the government, military and private sector. "Rebuilding our hollowed-out maritime industrial base is a national security imperative," Phelan, the Navy secretary, told U.S. lawmakers in May 2025. As Phelan and the executive orders make clear, the cooperation and partnerships with Allies must be factored into any solution. Tallis, of the Center for Naval Analyses, said the U.S. — much as the maritime executive order lays out — needs to build on its competitive advantages as well as the power of its alliances. "What we lack in an industrial maritime footprint," he wrote in DefenseNews, "we make up for in innovation, capital markets and financial services." ★

**The USS Minnesota, a fast attack submarine, docks at HMAS Stirling in Australia in February 2025. The base will host four of the U.S. Virginia-class submarines starting in 2027.** REUTERS



**MANAGING**

**NC3**

# MILITARY LEADERS BALANCE AI'S EMERGING CAPABILITIES WITH HUMAN CONTROL

SENTRY

**ATTEND** any conference or meeting of military leaders and one topic likely will materialize: discussion about the incorporation of artificial intelligence in warfighting. For nuclear command, control and communications (NC3), the implications are significant, presenting opportunities for enhanced analysis for decisions while raising concerns about human control.

“If we don’t think about AI, and we don’t consider AI, then we’re going to lose, and I’m not interested in losing,” United States Air Force Maj. Gen. Ty Neuman, director of Strategic Plans, Programs and Requirements at Air Force Global Strike Command (AFGSC), said during a March 2025 panel on NC3 architecture at the Air & Space Forces Association’s 2025 Warfare Symposium, according to The War Zone (TWZ) website. “So, we absolutely have to figure this out.”

Defense leaders see AI as a critical tool in modernizing systems, including NC3, and maintaining an edge over strategic competitors.

“AI has to be part of what the next-generation NC3 [architecture] is going to look like. We have to be smart about how we use that technology,” Neuman said. “Certainly, the speed is probably the most critical thing. There’s going to be so much data out there, and with digital architectures, resilient architectures and things like that, we have to take advantage of the speed at which we can process data.”

AI refers to modern machine learning (ML) programs with the potential to “learn” from massive amounts of data and act independently of human intervention by solving problems or performing functions that traditionally required human cognition.

Modernizing the nuclear deterrent, including the NC3 systems that stitch together the weapons systems that make up the nuclear triad, is a high priority for the U.S. Department of War (DOW) and many of its Allies and partners, including NATO.

“We need to direct research efforts to understand the risks of cascading effects of AI models, emergent and unexpected barriers, and indirect integration of AI

into nuclear decision-making processes,” U.S. Air Force Gen. Anthony Cotton, Commander of U.S. Strategic Command, said at the 2024 Department of Defense Intelligence Information Systems conference in Omaha, Nebraska. “Advanced AI and robust data analytics provide decision advantage and improve our deterrence posture. [Information technology] and AI superiority allows for more effective integration of conventional and nuclear capabilities, strengthening deterrence.”



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~ U.S. Air Force Maj. Gen. Ty Neuman  
director of Strategic Plans, Programs and Requirements  
at Air Force Global Strike Command

## **'Exponentially faster' than a human**

The integration of AI systems into NC3 could mitigate human error or bias in nuclear decision-making, preventing egregious errors during a crisis when nuclear risk is greatest, Peter Rautenbach, a researcher at the University of Leicester in the United Kingdom, said in a September 2022 report in Arms Control Today, a publication of the Arms Control Association. Rautenbach’s report noted that the potential for AI systems to assess large amounts of data is a benefit, being “exponentially faster than a human



United States Air Force crew members conduct in-flight duties aboard a U.S. Navy E-6B Mercury at Vandenberg Space Force Base, California.

JOSHUA M. CARROLL/U.S. AIR FORCE

analyst,” ensuring accurate, timely information for decision-makers to recognize early attacks. “In doing so, these systems would be providing decision-makers with the best possible information for use in a crisis,” he said. “The ability to find correlations by continuously sorting through large amounts of data with an unbiased eye is of particular relevance to early warning systems and to prelaunch detection activities within the nuclear security field.”

“As a human operator on a [communications] system in today’s world, I will not have the ability to determine what is the most secure and safest pathway, because there’s going to be signals going in 100 different directions,” Neuman told the Warfare Symposium audience. “Some may be compromised. Some may not be compromised. I will not be able to determine that, so AI has to be part of that.”

AI can give leaders more “decision space” to ensure that the entire nuclear enterprise remains secure, Gen. Cotton said. “Our adversaries must know that our nuclear command and control and other capabilities that provide decision advantage are at the ready 24/7, 365 [days a year] and cannot be compromised or defeated.”

“We can analyze historical data and identify trends, and those AI tools could be used in a predictive manner. We could use it on our systems to proactively manage just



German Defence Force and U.S. Air Force teams participate in the Transformational Modeling for Battle Management experiment using an artificial intelligence-enabled technology known as Match Effectors at Nellis Air Force Base, Nevada.

KEITH KEEL/U.S. AIR FORCE

like our system maintenance, be able to plan the upgrades to the system, and reducing the risks to unexpected interruptions or disruptions,” U.S. Space Force Col. Ryan Rose, deputy director for Military Communications and Positioning, Navigation and Timing at Space Systems Command, said during the Warfare Symposium panel, according to TWZ. “Additionally, the data or trends related to cybersecurity, or being able to see what our adversaries

are up to, could also be useful for decision-makers.”

As emerging technology, AI systems are not without risks. Potential problems Rautenbach identifies include:

- **Alignment.** The machine may act as instructed but not as programmers wanted. An unaligned AI system could have disastrous consequences. “In the face of complex operating environments, machine learning systems are often faced with the problem of their own brittleness, the tendency for powerfully intelligent programs to be brought low by slight tweaks or deviations in their data input they have not been trained to understand.”
- **Inadequate data sets.** Insufficient data in newer systems or language models may result in a system being unreliable, particularly if it is using simulated training data. “Although there are extensive records associated with the launch of older ballistic missiles, newer, less-tested models may require the use of simulation,” Rautenbach said. “The lack of data in terms of real-world offensive nuclear use is undoubtedly fortunate for the world, but it nevertheless means that much of the data involved in training machine learning programs for NC3 systems will be artificially simulated.” The result can be an AI system that looks capable but fails when used in real-world conditions, he said.
- **Human bias.** Machine learning systems may contain the biases of the humans who created them, Rautenbach said. Just as some ML systems have displayed gender or racial bias, similar problems could occur in AI systems trained to observe the actions of adversarial nations. “Human bias could sneak into the system and the data relating to certain actors or variables would cease to accurately reflect what is occur-

ring in the real world,” he said. If a resulting warning is assumed by a nation’s leadership and military to be balanced and fair when it is perpetuating bias, the result could be “catastrophic miscalculation,” furthering the risk of responding to false positives.



HUMAN BIAS COULD SNEAK INTO THE SYSTEM AND THE DATA RELATING TO CERTAIN ACTORS OR VARIABLES WOULD CEASE TO ACCURATELY REFLECT WHAT IS OCCURRING IN THE REAL WORLD.”

~ Peter Rautenbach

Researcher at the University of Leicester, United Kingdom

Officials break ground on the 21,000-square-meter Nuclear Command, Control and Communications Campus at Offutt Air Force Base, Nebraska.

DECLAN BARNES/U.S. ARMY CORPS OF ENGINEERS

### Humans in the loop

Defense leaders say they are cautiously moving forward to incorporate AI into military systems. Current uses typically fall in the realm of data collection and analytics for functions considered to be routine. In January 2025, the U.S. Navy destroyer USS Fitzgerald became the first warship to deploy AI, incorporating a remote monitoring system to predict maintenance issues and improve fleet readiness. The National Geospatial-Intelligence Agency (NGA) is using AI to analyze satellite and other data to find potential targets via its Maven program launched in 2017. Maven’s next iteration will include AI technology with “reasoning”





ADVANCED SYSTEMS CAN INFORM US  
FASTER AND MORE EFFICIENTLY. BUT WE  
MUST ALWAYS MAINTAIN A HUMAN DECISION  
IN THE LOOP TO MAXIMIZE THE ADOPTION  
OF THESE CAPABILITIES AND MAINTAIN OUR  
EDGE OVER OUR ADVERSARIES."

~ U.S. Air Force Gen. Anthony Cotton, Commander of U.S. Strategic Command



A U.S. Air Force E-4B plane, which has nuclear command, control and communications capabilities, prepares to receive fuel from a KC-135R Stratotanker.

CODIE TRIMBLE/U.S. AIR FORCE

capabilities to detect anomalies that are potential threats, Vice Adm. Frank Whitworth, head of NGA, told Defense One magazine. This capability could detect anomalies such as an adversary truck in an unexpected location or a weapons facility that shows a sudden change in activity, Whitworth said.

In addition to the U.S., Allies and partners are also looking at ways to incorporate AI to enhance security. NATO's revised strategy released in July 2024 aims to:

- Provide a foundation for NATO Allies to lead by example and encourage responsible AI development and use for defense and security.
- Accelerate and mainstream AI adoption in capability development and delivery, enhancing interoperability as a key element within the Alliance, including through the delivery of AI use cases.
- Protect and monitor the Alliance's AI technologies, manage related risks and protect NATO's ability to innovate, addressing security policy considerations.
- Identify and safeguard against the threats from adversarial use of AI.



WE MUST CRAFT  
FRAMEWORKS THAT  
MAXIMIZE INNOVATION  
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SECURE AND ETHICAL  
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OF EFFECTIVE AI  
GOVERNANCE."

~ Shigeo Yamada  
Ambassador of Japan to the United States

Globally, leaders also are addressing guidelines to ensure AI systems are safe and dependable. In February 2023, the U.S. State Department published the Political Declaration on Responsible Military Use of Artificial Intelligence and Autonomy. As of June 2025, nearly 60 nations had endorsed the declaration.



Gen. Anthony Cotton speaks at the 2024 Deterrence Symposium in Omaha, Nebraska. U.S. STRATEGIC COMMAND

"We must craft frameworks that maximize innovation while ensuring the trustworthy, secure and ethical use of AI. This balance is the cornerstone of effective AI governance," Shigeo Yamada, Japan's ambassador to the U.S., said at a December 2024 conference on AI hosted by the Center for Strategic and International Studies in Washington, D.C. "How we will ensure AI is trustworthy and beneficial for everyone remains an open question."

It is imperative, Rautenbach said, that integration of AI with NC3 takes into consideration current technical limitations to reduce risk. U.S. defense leaders agree, emphasizing that while AI will be a key feature in future weapons systems, including NC3, humans will always be in the decision-making loop.

"Advanced systems can inform us faster and more efficiently," Gen. Cotton said. "But we must always maintain a human decision in the loop to maximize the adoption of these capabilities and maintain our edge over our adversaries."

Safeguards will be crucial, leaders said. The U.S. and its Allies and partners do not want to fall behind competitors, and the pressure to rapidly develop these systems increases the risk of imperfections.

"As good as AI is, as good as computer process and things like that could be, it's really only as good as the data that is fed into it," Neuman said. "Therefore, if the data is corrupted, then we have no way of actually determining whether the data or the output is actually there. So, therefore, we absolutely have to have the human in the loop there."

"I think it's important to push the boundaries of AI, and deliver innovative solutions that are reliable and trustworthy, but I also recognize that the integration of AI, specifically in NC3 systems, presents some challenges and risks," Rose said. "With robust testing, validation and implementing oversight mechanisms, I think we can find a way to mitigate some of those risks and challenges, and ultimately deliver AI systems that operate as they're intended." ★

# AXIS OF OPPORTUNISM



The Chinese People's Liberation Army Navy guided-missile destroyer PLANS Baotou sails the Gulf of Oman during combined drills with Iran and Russia in March 2025. AFP/GETTY IMAGES



## Cooperation Between China and Russia Is More a Matter of Convenience Than Ideology

SENTRY

**W**hen Chinese Communist Party (CCP) General Secretary Xi Jinping met with Russian President Vladimir Putin in Moscow in May 2025, he called the bond between the two countries “unbreakable.”

China and Russia, Xi said, should be “friends of steel.”

Xi was in Moscow to help Putin celebrate the 80th anniversary of the end of World War II in Europe, an appearance that experts said was heavy on projecting a unified relationship between Beijing and Moscow, with the pomp and circumstance of a huge military parade in Red Square as a backdrop. The two leaders signed what CCP state media called a “joint statement on further deepening China-Russia comprehensive strategic partnership of coordination for a new era,” according to CNN, which noted that Putin and Xi typically release such “wide-ranging joint statements” after their meetings. The visit was Xi’s 11th to Russia since becoming CCP leader in 2013, and the two have met on more than 40 occasions, according to a

Chinese Communist Party General Secretary Xi Jinping and Russian President Vladimir Putin attend a wreath-laying ceremony in May 2025 at the Tomb of the Unknown Soldier in Moscow, one of several ceremonies in Russia marking the 80th anniversary of victory in Europe over Nazi Germany during World War II. GETTY IMAGES

May 2025 BBC story.

The CCP’s support of Putin’s war on Ukraine — as well as the backing of Russia by Iran and North Korea — have led some to conclude that those nations now form an “axis of upheaval.” Some view their cooperation — whether in military aid, commerce or policy — as an effort to weaken the global standing of the United States. Other experts say that view overstates the relationship between China, Iran, North Korea and Russia, which is not a formal alliance. The countries may share anti-Western sentiments, the experts say, but their interests often diverge, and their assistance remains transactional. Unlike those autocracies, the relationships forged between the U.S. and its Allies are crucial to protecting a stable and open international system.

“The strength of our alliances and partnerships gives us the asymmetric advantage that our competitors do not enjoy,” U.S. Air Force Gen. Anthony Cotton, Commander of U.S. Strategic Command, said in a February 2024 interview with the U.S. military journal *Joint Force*.

The Council on Foreign Relations (CFR), in a 2024 analysis, noted that even though China and Russia have deepened their strategic partnership over the past decade, they are not formal allies. “[T]he countries’ alignment is driven more by their common rivalry with the United States than by any nat-

Italian special operations Soldiers and a U.S. Army Green Beret secure a vehicle while conducting a simulated ambush during the multinational exercise Swift Response in Pabradė, Lithuania, in May 2025.

ANTHONY ACKAH-MENSAH/U.S. ARMY



NATO Secretary-General Mark Rutte, center, shares a laugh with U.S. War Secretary Pete Hegseth, right, and then-U.S. Army Gen. Christopher Cavoli, who was Commander of U.S. European Command and NATO's Supreme Allied Commander Europe, during a meeting of NATO defense ministers at the Alliance's headquarters in Brussels in February 2025. REUTERS

ural affinity,” the CFR said. If Xi’s characterization of the friendship between Beijing and Moscow is one of steel, then many say a more accurate description is to a malleable alloy such as tin — especially when viewed in comparison to those of the U.S. and its Allies.

“We see a lot of exchanges between the two men and patriotic displays of togetherness,” Mathieu Boulègue, of the Center for European Policy Analysis, said of Xi and Putin in the BBC report. “They can be friends on one end or cooperating on one end and then ripping each other apart on others, and actually be competitors in certain aspects of their relationship. We get wowed by the symbolism. There’s a lot of performance around this relationship. But it is interesting to look at the real

substance.”

The substance includes Moscow’s mistrust of China. In June 2025, The New York Times newspaper reported that a secretive unit within the FSB, Russia’s domestic security agency, refers to the Chinese Communist Party as “the enemy” and a security threat. The analysis is in an internal planning document obtained by the Times that addresses China’s increasing espionage and efforts to acquire sensitive Russian military technology. It warns that China spies on Russian operations in Ukraine to learn about warfare and Western weapons. The analysts worry that Chinese academics are laying groundwork for claims on Russian territory, and that China is conducting espionage in the Arctic. The document, which may be a draft, dates from 2023 or 2024, according to the Times, which said the cybercrime group Ares Leaks obtained it. The Times said it shared the document with six Western intelligence agencies and all deemed it authentic.

### A New Axis?

Andrea Kendall-Taylor and Richard Fontaine, of the Center for a New American Security, are credited with coining “axis of upheaval” to not only describe the growing alignment between China and Russia but also their increasing cooperation with Iran and North Korea. They chronicled one example in the May-June 2024 issue of the journal *Foreign Affairs*: “In the early morning of January 2, [2024], Russian forces launched a mas-

“THE STRENGTH OF OUR ALLIANCES AND PARTNERSHIPS  
GIVES US THE ASYMMETRIC ADVANTAGE THAT  
OUR COMPETITORS DO NOT ENJOY.”

~ U.S. Air Force Gen. Anthony Cotton, Commander of U.S. Strategic Command

U.S. Marines fire an M2A1 machine gun as part of the exercise Swift Response 25 in Setermoen, Norway, in May 2025, providing support to the U.S. Army 82nd Airborne Division as part of multidomain operations in the High North.

FRANCO LEWIS/U.S. MARINES



sive missile attack on the Ukrainian cities of Kyiv and Kharkiv. ... The incident was notable not just for the harm it caused but also because it showed that Russia was not alone in its fight. The Russian attack that day was carried out with weapons fitted with technology from China, missiles from North Korea and drones from Iran. Over the past two years, all three countries have become critical enablers of Moscow's war machine in Ukraine." Those countries continue to enable that machine. Examples of the aid and Russian reciprocity:

- **China:** "As Russia faced isolation from the West, China increased its engagement with Moscow, keeping the Russian economy afloat through purchases of oil and other natural resources and supplying Russia with critical dual-use technology and components to sustain the war effort," The New York Times said in a May 2025 analysis. Ukraine said that Beijing is supplying a range of critical products to Russia. Oleh Ivashchenko, the chief of Ukrainian foreign intelligence, told the Ukrinform state news agency: "There is information that China supplies tooling machines, special chemical products, gunpowder and components specifically to defense manufacturing industries," Reuters reported in May 2025.

come from China. Chinese companies also provide ... navigation equipment, jamming devices, aircraft parts, drones, rifles, ammunition and trucks."

- **North Korea:** In May 2025, the Multilateral Sanctions Monitoring Team — a group of 11 nations that includes the U.S. and key Allies — released a report that said Pyongyang had supplied at least 100 ballistic missiles, some 9 million rounds of artillery and rocket ammunition, and more than 11,000 troops for use against Ukraine, according to The Wall Street Journal newspaper. The report called those transfers "flagrant violations" of United Nations resolutions. In return, Russian aid to North Korea has included military funding, air defenses and much more refined petroleum than it is allowed to produce under U.N. sanctions, according to the report.
- **Iran:** Tehran has supplied attack drones and missiles used against Ukraine. In return, Russia has sent weapons experts to Iranian missile production facilities to consult on their efforts, Reuters reported. In May 2025, Iran's parliament approved a 20-year strategic partnership between the two countries. The agreement included closer defense cooperation.



North Korean Public Security Minister Pang Tu Sop meets with Russian Vice Interior Minister Vitaly Shulika in Pyongyang, North Korea, in May 2025.

THE ASSOCIATED PRESS

Kendall-Taylor, also in testimony to the USCC, spoke on the historical use of the term axis, which grew partly out of the expansionist ambitions of Germany, Italy and Japan in the mid-1930s as well as those nations' authoritarian ideologies. The term was first used by Italian dictator Benito Mussolini in a 1936 speech. Mussolini described Italy's relationship with Nazi Germany as an "axis around which all European States animated by a desire for peace may collaborate on troubles." Kendall-Taylor told the USCC that the term best describes "what China, Russia, Iran and North Korea are doing — they are collaborating on their troubles. Their shared aim of weakening the United States and its power and influence provides such strong motivation for their actions. This new axis of upheaval, then, is best thought of as a collection of dissatisfied states converging on a shared purpose of overturning U.S. leadership, along with the principles, rules and institutions that underlie the prevailing international system."

### A Different Axis

Alexander Gabuev, writing in the April 2024 issue of Foreign Affairs, described the relationship between Beijing and Moscow as the sole axis among those dissatisfied states. "The Kremlin now assesses every relationship with a foreign power through a lens of three essential considerations: whether this relationship can help Russia directly on the battlefield in Ukraine, whether it

Elizabeth Wishnick, a senior research scientist for the Center for Naval Analyses, told the U.S.-China Economic and Security Review Commission (USCC) in February 2025 testimony: "The Chinese government claims it does not send lethal aid to Russia for its war effort in Ukraine, but 78% of Russian imports of semiconductors and 96% of smart cards — important components for a wide range of military technologies —



**U.S. Army Maj. Gen. Winston Brooks, center, then commander of the Fires Center of Excellence at Fort Sill, poses with German and Netherlands generals after giving the U.S. Allies a tour of the Oklahoma base in May 2025.**

JAOTOREY JOHNSON/U.S. ARMY

can help sustain the Russian economy and circumvent sanctions, and whether it can help Moscow push back against the West and punish the United States and its Allies for supporting Kyiv. Russia's relationship with China emphatically checks all three boxes."

While Gabuev noted three considerations in the Sino-Russian relationship, Kimberly Donovan, director of the Economic Statecraft Initiative for the Atlantic Council think tank, said her research showed only one issue uniting all four countries mentioned as the axis. "Being sanctioned by the West is one of the few things these rogue states have in common," she told the USCC. "Sanctions severely restrict these countries' access to the U.S.-led global financial system, limit their ability to trade in commodities, generate revenue and import sophisticated technology. Donovan said her team's work at the Atlantic Council concluded that "China is enabling Russia as well as Iran to circumvent and evade Western sanctions." In all, she said, those countries and North Korea have devised elaborate systems — including the use of third-country proxies and maritime "shadow fleets" of tankers to circumvent sanctions on commodities such as oil. Donovan uses a different description for the countries' joint efforts: "We have coined this network the axis of evasion."

### Advantages and Disadvantages

Wishnick, who also testified before the USCC, acknowledged the deepening military ties among the nations — especially those of China and Russia. She noted that development of their partnership began in the mid-1990s and "facilitated China's aim to become a maritime great power and focus military resources in the Indo-Pacific." Today, military exercises between China and Russia help the People's Liberation Army and the People's Liberation Army Navy gain modern battlefield insights that both services lack. "Chinese military analysts ... are mining the [Ukraine] conflict for information about the role of new technologies in warfare, the performance of particular systems, the role of ground forces ... and the challenges of combined operations," Wishnick said.

Despite the countries' combined efforts, as well as naval exercises held with Iran, Wishnick points out some important distinctions. "China and Russia have participated in more than 100 bilateral and multilateral exercises since 2005, with half taking place since 2017. The increased frequency needs to be kept in perspective — NATO conducts approximately 100 exercises in an average year," she told the USCC. "For both China and Russia, signaling is an important part of the joint exercises, which often precede or follow

exercises by the U.S. and its Allies.” While China and Russia have expanded the range and complexity of their efforts, it has not led to a more unified fighting force: The U.S. Department of War finds that the Sino-Russian exercises have “only modestly improved their capabilities and interoperability,” Wishnick said.

“Unlike the NATO Alliance, where the diverse membership trains for combined operations, China and Russia largely train together to improve confidence-building and develop familiarity with their different technologies and approaches to combat,” Wishnick said.

## The Allied Difference

In January 2024, U.S. forces deployed across the Atlantic Ocean and joined NATO Allies in Steadfast Defender, the Alliance’s largest exercise since the Cold War. Then-U.S. Army Gen. Christopher Cavoli, the former Supreme Allied Commander Europe, said in a news release that it “demonstrated the incredible strength of the trans-Atlantic bond between NATO Allies in Europe and those in North America.” The exercise involved 90,000 troops from all 32 NATO nations as well as ships and aircraft in what NATO called an “impressive display of unity and interoperability.” In contrast to China and Russia, NATO Allies have worked to improve their bonds and collaboration since the Alliance’s founding in



**Polish military helicopters fly over the Vistula River and a U.S. combat engineer vehicle during the NATO Dragon 24 exercise in March 2024 near Gniew, Poland. The exercise was a key element of Steadfast Defender 24, NATO’s largest military exercise in decades.**

GETTY IMAGES

**A U.S. Army AH-64D Apache helicopter engages simulated enemy targets during a combined live-fire exercise at Poland’s Drawsko Combat Training Center in August 2025. The Apache provided precision fire support for Polish ground forces. The demonstration showcased the Apache’s role in integrated air-ground operations and underscored U.S.-Polish interoperability within NATO’s defense framework.** CHARLIE DUKE, U.S. ARMY





**Russian President Vladimir Putin, left, walks with President Xi Jinping, center, of China and North Korea's leader, Kim Jong Un, before a September 2025 military parade in Beijing's Tiananmen Square. Western analysts said that despite the photo ops, the leaders remain wary of one another.** GETTY IMAGES

1949. In operating together, the U.S. and its Allies share common doctrine, procedures and bases. China enters into partnerships; it does not build alliances.

In the Indo-Pacific, there also is strong defense cooperation among the U.S., NATO members and regional Allies. The U.S.-led Rim of the Pacific (RIMPAC) is the world's largest international maritime exercise and includes Australia, India, Japan and South Korea. Another exercise, Talisman Sabre, had more than 40,000 military personnel from 19 participating nations in its 2025 iteration, which included the Philippines, Singapore and Thailand, and first-time participant Papua New Guinea. Those are just two examples of several large-scale exercises that enhance interoperability and readiness among the U.S. and Allies and partners in the region. There are also organizations such as the 10-nation Association of Southeast Asian Nations (ASEAN) that work to promote stability and cooperation. In 2023, ASEAN held its first joint military exercise that focused on noncombat missions such as disaster response and maritime security.

Combined exercises between China and Russia, meanwhile, lead to the assumption that they “coordinate their foreign policies, which they do not,” Wishnick told the USCC. Writing in March 2025 for the Foreign Policy Research Institute, Wishnick said: “Although authoritarian

states share an overriding interest in regime security and political survival, this does not necessarily mean that we should expect solidarity among similarly disposed regimes or believe that they would inevitably form an anti-Western axis. Despite the deepening Sino-Russian partnership, there are multiple areas of divergence. At this juncture Chinese and Russian officials have made a political decision to emphasize their areas of agreement — all of their joint statements do this, omitting any areas of discord.”

“The ... partnership between Beijing and Moscow appears to be a pragmatic, transactional relationship with strategic consequences for both sides, but one that is motivated by complementary rather than identical interests,” Eugene Rumer, director of the Russia and Eurasia program at the Carnegie Endowment for International Peace, wrote in November 2024. “By any measure, it falls well short of the ... World War II ‘axis.’ Moreover, close observers of Chinese policy maintain that Beijing is ‘uneasy’ with Moscow’s undisguised war of aggression. In private conversations, Chinese scholars do not criticize Russian policy overtly but do not endorse it either.”

Foster Klug, an Associated Press news director whose reporting focuses on the Indo-Pacific, echoed those who see cooperation between U.S. competitors as mostly transactional.

Klug called a September 2025 military parade in Beijing, where Kim and Putin stood with host Xi, as “simply more of the self-interested, diplomatic jockeying” that has long marked the region’s power dynamics. “Each of these leaders, in other words, is out for himself,” Klug wrote. ★



**CONNECTING**  
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# NATO strives for interoperability across functions, domains

SENTRY

**In** January 2024, Canadian and United States forces deployed across the Atlantic Ocean and joined NATO Allies to secure the continent's western flank, extending to the Arctic. The move was the first phase of Steadfast Defender, the Alliance's largest exercise since the Cold War, sending more than 90,000 troops from all 32 NATO nations to conduct combined exercises for four months. Steadfast Defender involved more than 50 ships, 80 aircraft and 1,100 combat vehicles, and tested enablement and deployment of Allied forces across all domains in the European theater.

NATO officials called Allies' performance in Steadfast Defender "an impressive display of unity and interoperability" resulting in greater security and deterrence in the region. The Alliance defines interoperability as the ability of Allies to act together coherently, effectively and efficiently to achieve tactical, operational and strategic objectives. Interoperability enables forces, units and systems to share common

doctrine, procedures and bases, and to operate together and communicate across systems. It reduces duplication and facilitates pooling of resources among Allies and partners. Interoperability also enables forces to adapt to shifting dynamics in the security environment.

"Exercise Steadfast Defender demonstrated the incredible strength of the trans-Atlantic bond between NATO Allies in Europe and those in North America," retired U.S. Army Gen. Christopher Cavoli, then Supreme Allied Commander Europe, said in a news release after the exercise. "The highly complex military activities conducted over the course of this exercise have demonstrated that this Alliance is capable and ready to conduct our core mission of collective defense."

NATO has worked to improve collaboration since the Alliance's founding in 1949. Allies recognized that if they

**Soldiers from Greece, Romania and the United Kingdom participate in close quarters combat drills during exercise Steadfast Dart 25 in Romania.** NATO





intend to fight side by side, they need to be able to share ammunition, fuel, spare parts, intelligence, battlefield tactics, standard operating procedures and radio frequencies, according to a March 2025 report from the U.S. Army War College. The benefits and necessity of being able to operate in tandem have been evident for decades, and the Alliance has established bureaucratic structures, policies and guidelines designed to achieve interoperability. Today, interoperability remains crucial, as military personnel rely on proven systems working together “to allow them to focus on planning and executing operations across all war-fighting functions, domains and echelons,” according to the paper.

NATO identifies four main dimensions where interoperability supports the Alliance’s initiatives: technical (hardware, equipment, armaments and systems); procedural (doctrines and processes); human (terminology and training); and information (data). As NATO addresses

multiple threats across all domains, achieving and maintaining the necessary level of interoperability is increasingly important but often challenging, as Allies and partners work to combine their capabilities while addressing concerns related to data security, technology integration, and language and cultural barriers. This “360-degree” threat perspective, adopted by NATO in its 2022 Strategic Concept, aims to ensure the Alliance is prepared for transnational security threats in today’s geopolitical environment.

“Russia’s full-scale invasion of Ukraine in 2022 and China’s rapidly growing military capabilities have highlighted how threats in one region can quickly impact security elsewhere,” Simon Hutagalung, retired diplomat from the Indonesian Foreign Ministry, said in a May 2025 Eurasia Review report. “NATO’s evolution into a global security organization addresses 21st-century challenges such as



**ABOVE: U.S. Marines participate in cold weather training during exercise Joint Viking 25 in Setermoen, Norway.**

ALEXANDER PETERSON/U.S. MARINE CORPS

**LEFT: U.S. Army paratroopers head to the Hohenfels Training Area, Germany, for Allied Spirit, a multinational exercise that supports NATO deterrence initiatives.**

MARKUS RAUCHENBERGER/U.S. ARMY

strategic competition, hybrid warfare and terrorism. Its long-term effectiveness depends on creating consensus regarding geographic partnerships and defining burden-sharing among member states.”

Interoperability is key to NATO achieving this goal, Hutagalung said, by ensuring the Alliance’s readiness as it faces multiple strategic competitors and technological upheaval. “NATO needs to enhance its partnership toolkit by shifting towards flexible, mission-oriented coalitions that can swiftly mobilize against emerging threats while ensuring interoperability.”

### **Reembracing collective deterrence**

Collective defense has long been NATO’s cornerstone. After the Cold War, however, the Alliance turned its focus away from strategic competition to interstate threats such as terrorism and natural disaster response. That changed with Russia’s

invasions of Georgia in 2008, Ukraine’s Crimean Peninsula in 2014 and the full-scale invasion of Ukraine in 2022. The Chinese Communist Party’s increasingly aggressive actions and weapons development also have raised concerns over security and preserving a stable and open international system.

As NATO reembraces collective defense, leaders are addressing the need to ensure Allies’ systems and practices will operate together effectively to face emerging threats. Achieving full interoperability brings a range of challenges. Each member nation has its own history, culture and military capabilities. Adding to the challenge is the changing nature of battle, including the incorporation of automation, artificial intelligence and gray-zone activities such as information warfare and lawfare.

Despite pursuing interoperability for decades, NATO Allies struggle to measure it, assess it, and build upon it fully and accurately, according to the authors of “Measuring

Interoperability Within NATO: Adapted off-the-Shelf Tool or Bespoke Solution?” a March 2025 report published by the U.S. Army War College. One obstacle to achieving interoperability is the lack of a standard format for data collection, measurement and analysis, according to the report.

“Without a standard, interpreting that data across time, nations and domains is a challenge that impairs NATO’s ability to leverage the information fully,” the authors said. “When conducting interoperability analyses, bespoke data collection and analysis takes away from time and resources that could be spent identifying lessons and acting upon them.”

Other hurdles to interoperability include identification and agreement on technical requirements and application functionality of working groups, communication and procurement issues among nations, Frank Gubbels, NATO Command and Control (C2) Center of Excellence (COE) section head, said in a 2023 paper. This can have a profound impact on C2, he said.

“At the operational level where our COE mainly assesses during major exercises, the gaps and issues regarding operating together in NATO become apparent,” Gubbels said.

Technology is the most challenging area in which to attain interoperability, according to an Army War College Carlisle Scholars report, because teams and countries have different weapons systems and vehicles. Data may not be recognizable or usable by another country. Maintaining secure voice and data communications can be a challenge, as well as sustainment and logistics.

Procedural interoperability is crucial to clearly understand authority, processes and terminology that teams need to work together. “If different Allies have different expectations of who can authorize or disallow a military strike, an Allied operation could be either inappropriately blocked or improperly authorized,” the authors of the Army War College report said. “Similarly, if Dutch forces based in Rotterdam follow different procedures for loading, securing and transporting military equipment headed east by rail to reinforce Allied defenses, Polish forces off-loading the equipment could experience inefficiencies, confusion or injury.”

NATO has identified three levels of interoperability, ranging from 0 (not at all interoperable) to 3 (fully integrated).

- Level 3 — forces operate together effectively without technical, procedural or human barriers. This level is characterized by common networks, capabilities, procedures and language.
- Level 2 — exists when forces are compatible and operate together without prohibitive technical, procedural or human barriers. It is characterized by similar or complementary processes and procedures.
- Level 1 — forces are “deconflicted” and operate in the same operational area in pursuit of a common goal but with limited interaction due to prohibitive technical, procedural or human barriers.
- At Level 0 — forces have no demonstrated interoperability and must operate independently from each other.



Two Croatian Rafale fighter jets conduct a simulated intercept with a U.S. Air Force B-52H Stratofortress during exercise Onyx Cross over Europe in March 2025.

KRISTEN HELLER/U.S. AIR FORCE



A Romanian Air Force F-16 fighter jet descends after refueling by a U.S. Air Force KC-135 Stratotanker over the North Sea during NATO's Ramstein Flag exercise.

CHRISTOPHER CAMPBELL/U.S. AIR FORCE

### Closing interoperability gaps

To address interoperability challenges, NATO in 2012 launched the Connected Forces Initiative (CFI) to increase Alliance interoperability through three lines of effort: training and education, exercises, and use of technology. A key component of CFI is Federated Mission Networking (FMN), which aims to support command and control and decision-making during operations through improved information sharing with the standards and capabilities that exist at the time of need. The all-inclusive structure of FMN's framework is governed and managed. It provides a permanent ongoing foundation with processes, plans, templates, enterprise architectures, capability components and tools needed to prepare, develop, deploy, operate, evolve and terminate mission networks.

In May 2025, NATO released a new data strategy, setting a 2030 target date to “facilitate the exploitation of curated, quality data between Allies, the NATO enterprise and their respective communities of interest.”

“The Data Strategy for the Alliance aims to accelerate NATO's transition into a datacentric organization, leveraging quality data for seamless interoperability and integration across all domains by providing guidance for managing NATO data and operationalizing its use for joint and multidomain operations,” NATO said in a news release.

The Alliance also regularly engages in full-scale, multidomain exercises to enhance procedural and human

interoperability. In addition to Steadfast Defender, NATO conducts multidomain exercises throughout Europe and in the Arctic each year.

“As the warfighting of tomorrow becomes more complex in a multidomain environment, we need to ensure that we are in every aspect faster and better than our competitors,” German Air Force Gen. Chris Badia, then Deputy Supreme Allied Commander Transformation, said during a January 2024 NATO news conference. “This goes with nations' transformation and this is a perpetual journey and not a one-time event. Our war transformation journey pushes boundaries, forging a collective edge in order to become better every day.”

As NATO works to sustain its long history of successful deterrence, Allies working together to embrace emerging technologies will ensure its strength continues, said Lt. Col. Jahara Matisek and James Micciche, then a U.S. Army strategist, in a February 2025 Small Wars Journal report. Strengthening interoperability in the human dimension, they added, is critical. Despite technological advancements, warfare remains at its core a human endeavor. Building trust and relationships is crucial and is achieved with sustained engagement.

“In practice, this means investing in personnel exchanges, joint training exercises and collaborative research and development initiatives,” Matisek and Micciche said. It also involves “cultivating cultural awareness and linguistic skills among military personnel to facilitate deeper understanding and more effective communication with diverse partners.” ★



EDGE OF  
**CONFLICT**

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# UNITING TO COUNTER WEAPONS OF MASS DESTRUCTION IN THE INDO-PACIFIC

CMDR. DANIEL POST/U.S. NAVAL WAR COLLEGE AND MYA MACNEIL/UNIVERSITY OF RHODE ISLAND

**T**he Indo-Pacific is a hub of geostrategic importance, especially in economic and security terms, intensifying competition in the region among major powers. Additionally, most of the nine nuclear-armed countries, including China, France, India, North Korea, Russia, the United Kingdom and the United States, play major roles in the region. Understanding how these states might come to use weapons of mass destruction (WMD), particularly nuclear weapons, is essential for preventing catastrophe. Due to the highly competitive environment, the Indo-Pacific is prone to interactions associated with the classic security dilemma: Actions to improve a country's security, even defensive ones, create insecurity in others and a corresponding arms buildup. A shifting regional power balance exacerbates such circumstances.

The dynamics are particularly worrisome because high-stakes objectives intersect with strategies backed by military and nuclear capabilities, heightening the risk of escalation.

The Chinese Communist Party (CCP) and North Korea pose the most acute challenges to the U.S. and its Allies and partners, with Beijing as the greatest pacing challenge to U.S. interests in the region,



A Republic of Korea Sailor trains in countering weapons of mass destruction in March 2025. REUTERS

◀ ROK Navy personnel conduct a counter-WMD exercise in March 2025. REUTERS

V-22 Osprey tilt-rotor aircraft participate in the Japan-ROK-U.S. exercise Freedom Edge in November 2024 in Japan. REUTERS





analysts contend. The primary objectives of Japan, South Korea and the U.S. contrast with those of the CCP. For example, Japan's Foreign Affairs Ministry states in its Free and Open Indo-Pacific strategy that Tokyo desires to "ensure peace and prosperity in the Indo-Pacific region and beyond, through establishing a free and open order based on the shared values and principles such as the rule of law."

Similarly, the South Korean strategy envisions a "free, peaceful and prosperous Indo-Pacific." The U.S. objectives in the region include advancing a Free and Open Indo-Pacific; building connections within and beyond the region; driving regional prosperity; bolstering security; and building resilience to transnational threats. All are challenged by the CCP in some way. Beijing's response to U.S. arms sales to self-governed Taiwan, which the CCP threatens to annex by force, illustrates the point. In September 2024, Beijing imposed sanctions against nine U.S. military-linked companies in response to such sales, Reuters reported. Beijing froze the firms' assets in China and banned China-based entities from conducting transactions with them, intending to pressure the U.S. to halt arms support.

China also employs aggressive maritime tactics. For example, in October 2024, the CCP's People's Liberation Army Navy (PLAN) conducted dual aircraft carrier exercises in the South China Sea to create a force-multiplier effect. The PLAN also conducted live

**Republic of Korea Soldiers conduct an anti-terror drill during exercise Ulchi Freedom Shield with the United States in Seoul in August 2024.** THE ASSOCIATED PRESS

combat drills, including air defense, anti-submarine and anti-ship operations, the South China Morning Post newspaper reported. Other tactics employed by CCP forces include ramming and firing water cannons at vessels operating lawfully within their respective nation's internationally recognized maritime zones. China also uses so-called soft power, such as planning to expand its infrastructure investment in Laos to transform it into a hub for trade across Southeast Asia, the Morning Post reported. Projects — which often saddle other nations with large debts and threaten national sovereignty — include railways, airports and seaports that aim to boost trade access for China to key Southeast Asian markets.

In the Indo-Pacific, China provides economic assistance to foster relationships with nations whose primary focus is on domestic socioeconomic development, Kei Koga, an assistant professor at Nanyang Technological University in Singapore, wrote in the March 2023 edition of a Pacific Forum publication. China encourages these nations to follow practices that diverge from international and U.S. standards, he explained.

Taiwan, with its proximity to China's mainland and major shipping lanes in the East China and South



China seas, is seen by the CCP leadership as a critical geostrategic possession. Control of Taiwan is a major near-term objective for Beijing. China is pursuing aggressive actions such as ramping up its military presence in and around the Taiwan Strait and conducting live-fire exercises. China is testing the limits of U.S. support to Taiwan and increasing the chance of crisis. Beijing has increasingly staged military drills encircling Taiwan. In April 2025, for example, the CCP launched war games with live-fire strikes in the East China Sea and blockade operations near crucial shipping lanes off Taiwan.

The U.S., however, opposes unilateral attempts to change the status quo in the Taiwan Strait by force or coercion and promotes freedom of navigation in the Indo-Pacific, viewing Chinese policy as expansionist, dangerous and a direct threat to U.S. interests.

North Korea also poses a serious threat. The authoritarian regime's primary objective is to retain control of North Korean society and maintain power. Its leaders portray the outside world as hostile and the resulting policies are rooted in fear, U.S. Defense Intelligence Agency (DIA) analysts reported.

Pyongyang's strategy is built upon deterrence and coercion, illustrated by its positioning of the military as the primary means to solve social, economic and political problems. Provocations such as frequent missile tests over the Sea of Japan, public displays of WMD capabilities and blatant threats of escalation clearly demonstrate the regime's willingness to aggressively pursue its top objective of survival.

### **WMD Risk in the Region**

The Indo-Pacific faces some of the highest risks of WMD use globally, according to analysts. Any clash between states threatens the stability of all others, creating a situation where a minor conflict could escalate

**V-22 Osprey tilt-rotor aircraft stage at Fukuoka Airport, Japan, during the Freedom Edge exercise among Japan, the Republic of Korea and the U.S. in November 2024.** REUTERS

and entangle actors whose survival may appear threatened. The risk of miscommunication or desperation in any high-stakes conflict could make nuclear use a possibility. William Leben, an analyst formerly at the Australian Strategic Policy Institute (ASPI), highlighted key factors that could contribute to a potential conflict with China.

First, nations place a high value on securing access and control over essential water routes, he wrote in a February 2024 ASPI publication. However, the doctrines and concepts behind naval platforms that control such domains have a propensity for escalation. Combined with the fact that striking first in a naval conflict has a significant tactical advantage, the incentive for escalation rises when critical interests such as maritime access are involved. Second, ambiguity surrounding China's nuclear doctrine and capabilities creates an avenue for misinterpretation. In September 2024, the Chinese defense ministry announced it had launched an intercontinental ballistic missile into the Pacific Ocean. Analysts suggest the test was a warning to the U.S. and its regional Allies amid escalating tensions. Beijing's demonstration of nonconventional capabilities underscores its increasing focus on nuclear deterrence. The integration of dual-use systems such as power technologies that overlap nuclear and conventional operations further heightens this risk.

In a high-intensity conflict, a nation could target another's conventional missile forces but might unknowingly strike its nuclear assets instead. The recipient could interpret this as a deliberate attack on nuclear forces, or potentially as a prelude to a nuclear strike, Leben wrote. This "escalation through entanglement" is



A drone drops fire-extinguishing powder during counterterrorism training in Goyang, South Korea.  
THE ASSOCIATED PRESS

a dangerous potentiality, James Acton, co-director of the Nuclear Policy Program at the Carnegie Endowment for International Peace, wrote in an article for the *International Security* journal.

The potential for escalation from North Korea's provocations also threatens peace and security. North Korea fired at least seven short-range ballistic missiles that flew about 400 kilometers before landing in waters near Japan's exclusive economic zone, *The Japan Times* newspaper reported. South Korea's military also confirmed Pyongyang launched several short-range missiles toward the Sea of Japan. Such moves can be interpreted as a deliberate and aggressive signal, and demonstrate a blatant disregard for other nations' borders, exacerbating tensions.

Furthermore, North Korea's limited diplomatic and economic leverage contributes to the risk of the leaders resorting to WMD use in conflict. North Korea's regional strategy relies on deterrence and coercion, according to DIA analysts. They estimated that spending ranges from \$7 billion to \$11 billion and that 20% to 30% of the North's gross domestic product is allocated to the military. Pyongyang also is presumed to have chemical, biological, radiological and nuclear programs, including the capability to engineer biological military products, according to the U.S. State Department. North Korea may possess several thousand metric tons of chemical warfare agents, including the capability to produce nerve, blister, blood and choking agents, DIA analysts reported. Its unsustainable strategy of allocating most of its resources to advancing WMD capabilities may lead North Korea to quickly run out of conventional options in a major regional conflict. In this scenario, desperation could prompt dictator Kim Jong Un to use catastrophic measures if he believes his regime is collapsing.

### Policy Recommendations

The U.S. continues to advance democracy and freedom in the Indo-Pacific by building and maintaining strong alliances, promoting regional stability and encouraging dialogue. For example, in 2023, Japan, South Korea and the U.S. implemented a multiyear trilateral exercise plan and activated real-time information sharing about missile warnings. By engaging in diplomatic and military domains, the U.S. has positioned itself as a stabilizing influence. Moving forward, it should continue to build on these successes by prioritizing clear communication channels and transparency in nuclear postures and by investing in conflict prevention mechanisms to reduce the risk of escalation. Recommendations include strengthening crisis communication mechanisms and bolstering diplomatic and military cooperation with Allies. By continuing to demonstrate its commitments to defending Allies and partners and preserving a Free and Open Indo-Pacific, the U.S. can support regional security and efforts to minimize the risk of inadvertent or accidental escalation. This will lead to the best potential for long-term strategic gains. ★



# DIGITAL TRANSFORMATION

*NATO adopts a strategy to advance technologies for future threats*

SENTRY

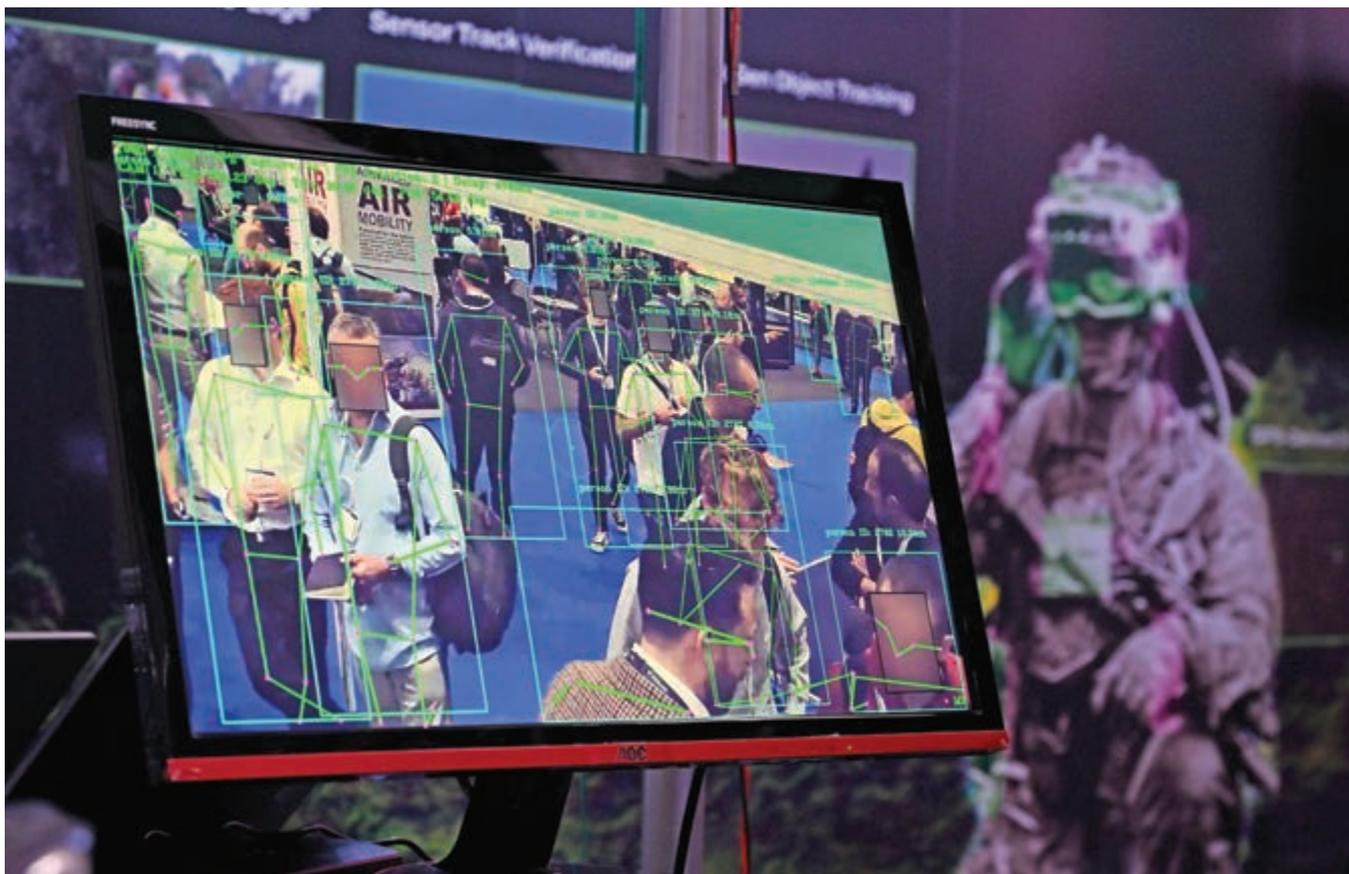
**IN A RAPIDLY CHANGING WORLD** where emerging technologies reshape the landscape of global security, NATO has embarked on a journey to digitalize defense mechanisms and ensure its readiness for future threats. This endeavor is encapsulated in the NATO Digital Transformation Implementation Strategy, an initiative aimed at revolutionizing the Alliance's operational capabilities. The road map — designed to complement the NATO 2030 vision for a ready, strong and unified Alliance in an era of increased competition — outlines a path for development in four key areas: people, process, technology and data.

“Technologies such as artificial intelligence (AI), autonomous systems and quantum technologies are changing the world and the way NATO operates.

These and other emerging and disruptive technologies (EDTs) present both risks and opportunities for NATO and Allies,” according to NATO's Strategic Warfare Development Command (SWDC). “That's why the Alliance is working with public and private sector partners, academia and civil society to develop and adopt new technologies, establish international principles of responsible use and maintain NATO's technological edge through innovation.”

**A Polish Soldier tests the Battlefield Management System during the Coalition Warrior Interoperability Exploration, Experimentation, Examination exercise, which enhances command and control capabilities for a modern and forward-looking military force.** GARRETT GILLESPIE/U.S. MARINE CORPS





### The Vision Behind NATO's Digital Transformation

NATO's commitment to digital transformation is not just a necessity but also a proactive step to address emerging challenges. As technology evolves, so do the methods of warfare and defense. The strategy aims to integrate advanced digital tools and systems within NATO's framework, enhancing interoperability, data management and cyber defense.

"The digital transformation initiatives in NATO and the EU [European Union] are having a positive impact as European governments pursue a path of incremental optimization of digital capabilities up to the 2030s," according to "Digitalisation of Defence in NATO and the EU: Making European Defence Fit for the Digital Age," a report published by the International Institute for Strategic Studies (IISS). "European security will benefit from the exchange of best practices around digital transformation, the establishment of common technical standards and data-sharing policies, and the coordination of digital capability requirements and goals in defense planning."

In 2022, the Alliance confirmed the need to enhance NATO's technological edge to strengthen deterrence and bolster its commitment to collective defense. The success of the strategy is predicated on a paradigm shift for cooperation, which extends to academia, civil society and industry.

"To embrace these opportunities and at the same time counter threats enabled by EDTs, NATO is working with Allies to develop responsible, innovative and

An AI surveillance program scans a crowd at an expo in England to detect potential threats or hazards by analyzing basic human physical behaviors such as walking, running, climbing, crouching or crawling. GETTY IMAGES

agile EDT policies that can be implemented through real, meaningful activities," the SWDC said. "By working more closely with relevant partners in academia and the private sector, NATO aims to maintain its technological edge and military superiority, helping deter aggression and defend Allied countries."

In the backdrop of the digitalization efforts is the NATO 2030 agenda, endorsed by Alliance leaders in June 2021. The initiative materialized as NATO adapts to growing global competition, more unpredictable threats, disruptive technologies and challenges to a stable and open international system from China, North Korea and Russia. "Standing strong together to face a more unpredictable and competitive world is what the NATO 2030 initiative is about," according to a fact sheet that outlined the following proposals:

- **Deepen political consultation and coordination.** Allied leaders pledged to consult more often on issues affecting security and committed to continuing to consult on issues like arms control, emerging and disruptive technologies, and to take steps to reestablish consultations on economic matters related to security.

- **Strengthen deterrence and defense.** Leaders agreed to bolster deterrence and defense and reaffirmed their commitment to maintain an appropriate mix of nuclear, conventional and missile defense capabilities.
- **Improve resilience.** Allies plan to take a more coordinated approach to resilience and agreed to develop policies that guide nationally tailored resilience goals and implementation plans based on clearer and more measurable Alliance-wide objectives. This will allow NATO to better assess efforts that support collective defense and better link resilience with the Alliance’s broader posture and plans.
- **Boost training and capacity building.** Allies agreed to increase NATO efforts to build capacity of Alliance members in areas like counterterrorism, stabilization, countering hybrid attacks, crisis management, peacekeeping and defense reform.
- **Preserve NATO’s technological edge.** Allies agreed to a civil-military Defence Innovation Accelerator for the North Atlantic (DIANA) to boost trans-Atlantic cooperation on critical technology, promote interoperability and harness civilian innovation.
- **Uphold a stable and open international system.** Allies agreed to strengthen relationships with like-minded partners and international organizations and forge new engagements with Africa, the Indo-Pacific and Latin America.

## The Role of Artificial Intelligence

AI is set to play a significant role in NATO’s digital transformation. AI can enhance decision-making processes, improve data analysis and bolster cybersecurity measures. The Alliance is investing in AI research and development to integrate these capabilities into its operations.

“The capabilities of AI technologies have continued to evolve at an ever more rapid pace. There has been unprecedented development and widespread availability of powerful emerging AI technologies, such as generative AI,” according to a July 2024 announcement on NATO’s revised AI strategy. “These technologies can generate complex text, computer code, and realistic images and audio, at near-limitless volume, that are increasingly indistinguishable from human-produced content. It is vital for NATO to use these technologies, where applicable, as soon as possible.”

A revised AI strategy seeks to accelerate and mainstream AI adoption in capability development and delivery, enhancing interoperability as a key element within the Alliance. “As Allied defense stakeholders, militaries and armed forces develop capabilities and responses to benefit from data and AI, NATO can act as a platform between Allies to facilitate information exchange and sharing of good practice, recognizing similar initiatives pursued by other organizations,” the Alliance said.



United States Army Soldiers with the Artificial Intelligence Integration Center update drone software during Allied Spirit, an exercise with NATO Allies and partners to develop and enhance interoperability and readiness.  
MICAH WILSON/U.S. ARMY

## The Path Forward

As NATO progresses with its digital transformation, it remains committed to transparency and accountability. Regular assessments and updates will ensure that the strategy remains aligned with the evolving technological landscape and security environment.

The implementation strategy outlines a phased approach, with short-, medium- and long-term goals. This structured plan allows for flexibility while ensuring steady progress.

NATO’s Digital Transformation Implementation Strategy highlights the Alliance’s foresight and commitment to adapt to the modern age. By embracing digitalization, NATO not only is enhancing its defense capabilities but also setting a precedent for global security organizations.

“Supremacy on the battlefield requires dominating all domains, combined with the orchestration of military activities, synchronization of nonmilitary activities and the delivery of converging effects at the speed of relevance,” according to the strategy.

As the world moves toward a more digitized future, NATO’s efforts will play a crucial role in shaping the security dynamics of tomorrow. The strategy reflects a blend of innovation, collaboration and resilience, ensuring that NATO remains at the forefront of global defense.

“To succeed, digital transformation must be technologically relevant, have geographical and organizational scalability, be human-centric (people first) and, importantly, win the race against time,” the IISS report said. “A well-functioning and secure digital enterprise and force will be key enablers of the planned technological transformation of European armed forces. Both are prerequisites to embracing multidomain integration and achieving decision superiority in today’s strategic environment.” ★

# PURSUING THE HIGHEST STANDARDS

COLLABORATION, BALANCE OF POWER  
AMONG ALLIES KEY TO GLOBAL STABILITY

AUSTRALIAN DEPUTY PRIME MINISTER AND MINISTER FOR DEFENCE RICHARD MARLES

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*This speech was delivered during the International Institute for Strategic Studies (IISS) Shangri-La Dialogue in Singapore in May 2025. It has been edited to fit Sentry's format.*

I am delighted to be back at the Shangri-La Dialogue, my fourth as Australia's deputy prime minister and the minister for defence. It is a credit to the government of Singapore and the IISS [International Institute for Strategic Studies] that the dialogue has become the indispensable forum to talk about Indo-Pacific security.

Our region has become the world's most consequential strategic arena. And while war and disorder rages in European and Middle Eastern theatres, we cannot be complacent here. Resurgent geopolitical tensions mean the Indo-Pacific is not only the venue for the world's largest conventional military and nuclear rearmament, it has also become ground zero in the race for technological supremacy.

Today's session on arms control and proliferation, a set of issues that sit at the intersection of military capability and technology, is particularly apt. We owe the arms control regime we know today – this architecture of restraint – to the Cold War, when the fateful emergence of nuclear weapons and ballistic missile technologies drove an urgent global consensus on the need to derisk U.S.-Soviet competition. It created the platform for one of the great achievements of multilateralism: the landmark Treaty on the Non-Proliferation of Nuclear Weapons, the NPT. This treaty not only became the indispensable framework to limit the spread of nuclear weapons; it and subsequent agreements formed the cornerstone of global nonproliferation efforts: first nuclear, then biological and then chemical.

The NPT has made the world safer. It remains as relevant today and is as important as ever. And it is essential that all of us remain committed to it. For our part, Australia conforming to the NPT is a fundamental tenet of our strategic and foreign policy. Australia acquiring a nuclear-powered submarine capability under the banner of AUKUS [a security collaboration among Australia, the United Kingdom and the United States] is essential to our national security and will play a part in

providing geostrategic balance in the Indo-Pacific.

In moving down this path at all times, Australia will comply with the NPT, which is why we are pursuing the highest safeguard standards through an arrangement with the IAEA [International Atomic Energy Agency] under Article 14 of Australia's Comprehensive Safeguards Agreement.

Also emerging from the Cold War era: the Strategic Arms Limitation Talks (SALT), the Intermediate-Range Nuclear Forces (INF) Treaty and the Missile Technology



**Australian and U.S. Navy personnel hold a multilateral operations exercise with the United Kingdom in the South China Sea in February 2025.** MONICA WALKER/U.S. NAVY

Control Regime (MTCR). These were not acts of altruism but pragmatic responses to the existential dangers of unbridled proliferation. These agreements, while imperfect, provided crucial stability in an era where the risk of miscalculation could have been catastrophic.

When the Cold War ended 35 years ago, many assumed the need for strategic arms control ended too. It is a measure of our times that this assumption has proved so spectacularly inaccurate. The world now faces new and increasingly complex strategic challenges – ever more uncertain and unpredictable. The global architecture that provided a foundation for strategic deterrence and assurance has fallen into dangerous decline.

The INF collapsed in 2019, leaving nonstrategic nuclear

**Richard Marles told the audience in Singapore: The Indo-Pacific has "become ground zero in the race for technological supremacy."** GETTY IMAGES



weapons unchecked by a formal agreement. Russia suspended its participation in the last remaining binding bilateral arms-control treaty between the United States and Russia – New START – in 2023, with the treaty itself set to expire in February [2026]. This leaves no legally binding limits on the strategic nuclear arsenals of the two largest nuclear powers for the first time since 1972.

In a more interconnected world, bilateral controls are insufficient. More countries are invested in shaping the geostrategic environment. China's decision to pursue

**Royal Australian Navy divers prepare for a familiarization dive with a Pearl Harbor Naval Shipyard and Intermediate Maintenance Facility diver as part of AUKUS training to work on nuclear-powered submarines.** UNITED STATES INDO-PACIFIC COMMAND

systems. New technologies like cyber, the weaponization of space, and the ability to integrate nuclear weapons with autonomous systems means traditional arms control frameworks are being surpassed without any established method of control to supplement them.

We also have to counter the grim, potentially imminent, possibility of another wave of global nuclear proliferation as states seek security in a new age of imperial ambition. In a profound abrogation of its responsibilities as a permanent member of the U.N. Security Council, Russia has threatened to use nuclear weapons in its war of conquest in Eastern Europe. Not only does this work against states disarming their own nuclear arsenals, as Ukraine responsibly did in 1994, the war is prompting some frontier states most exposed to Russian aggression to consider their options.

And this has dire consequences for our region too.

Russia has agreed [to] a strategic partnership with North Korea to access the munitions and troops Moscow

## **WHEN THE COLD WAR ENDED 35 YEARS AGO, MANY ASSUMED THE NEED FOR STRATEGIC ARMS CONTROL ENDED TOO. IT IS A MEASURE OF OUR TIMES THAT THIS ASSUMPTION HAS PROVED SO SPECTACULARLY INACCURATE.**

rapid nuclear modernization and expansion, which aims in part to reach parity with or surpass the United States, is another reason the future of strategic arms control must be revitalized. And that is a difficult and daunting project.

Today's world demands we move beyond the simple focus on numbers and types of warheads and delivery

**ARMS CONTROL MUST BE SEEN AS A NECESSARY BUT NOT SUFFICIENT FEATURE OF A BROADER STRATEGIC ORDER THAT WE MUST BUILD ANEW, AN ORDER DEFINED AS MUCH BY RULES AND NORMS AS IT IS BY POWER.**



The USS Hawaii departs HMAS Stirling in September 2024, marking the conclusion of a historic submarine maintenance period in Western Australia as part of AUKUS Pillar 1. RORY O'CONNOR/U.S. NAVY

needs to continue its war. The probability that Russia is transferring nuclear weapons technology in payment for Pyongyang's support places intolerable pressure on both South Korea and Japan. At the same time, Iran's nuclear program and its belligerence to its neighbors is also destabilizing. All these actions risk sparking new proliferation cycles in both Europe and Asia, jeopardizing U.S. extended nuclear deterrence arrangements: a critical if under-sung asset in the fight against nuclear proliferation.

In short, arms control today is vastly more complicated, and the risks are growing. The landmark treaties that defined that era of arms control, including the NPT, are just as relevant today as they were decades ago. As imperfect as they are, strengthening transparency, compliance and risk reduction is key to making them work today.

As Australia's National Defence Strategy argued [in 2024], we must also invest in the arduous task of building a new architecture of restraint that addresses the realities of today's geopolitical environment and the unique characteristics of new technologies before they are fully integrated into military arsenals. The arms control regime that we knew was a foundational component of an oft-maligned concept – the international rules-based order.

Arms control must be seen as a necessary but not sufficient feature of a broader strategic order that we must build anew, an order defined as much by rules and norms as it is by power. Any such durable Indo-Pacific order must be characterized by a balance of power that helps manage

strategic competition.

In geopolitics, imbalance is provocative. It alters the calculus around the risks of military force and invites the kind of deterrence failure we saw in Europe three years ago.

China is embarked on the largest conventional military buildup since WWII. It is doing so without providing any strategic transparency or reassurance. And this remains a defining feature of the strategic complexity that the Indo-Pacific and the world faces today.

The commitment underscored by U.S. Secretary of Defense [Pete] Hegseth today that the Indo-Pacific is the United States' strategic priority is deeply welcome. The reality is that there is no effective balance of power in this region absent the United States. But we cannot leave this to the U.S. alone. Other countries must contribute to this balance as well, including Australia.

Through the largest peacetime increase in defense spending since the end of the Second World War, Australia is investing in a generational transformation of the [Australian Defence Force] to ensure we are not only in a position to deter force projection against us but also – and perhaps even more importantly – to contribute to an effective regional balance where no state concludes that force is a viable way to achieve strategic goals. Our government is making a generational investment into defense, and we will

**Marles, right, puts a souvenir hat on Indonesia's Defence Minister Sjafrie Sjamsoeddin after the two met in June 2025.** REUTERS





**Royal Australian Navy Sailors complete a visual inspection of a Mark IV remotely operated vehicle during an AUKUS Pillar 2 technology demonstration in December 2024.**

JUSTIN E. YARBOROUGH/U.S. NAVY

continue to make further funding decisions based on the assets and capabilities we need to play our part and to meet the strategic moment.

A durable order in the Indo-Pacific must also maintain incentives to keep the peace. While a balance of power seeks to ensure that states accept the risks of territorial conquest are too great, they must also be convinced that the peace is too valuable. In practice, this means both preserving and building the interdependencies among states in trade, investment, ideas and people.

Derisking supply chains is an unfortunate but necessary response to intensifying strategic competition. But letting this tip over into wholesale decoupling would be a grave mistake. Dividing the Indo-Pacific into geostrategic and geoeconomic blocs would not only make us all poorer, it would make us more vulnerable to conflict. If opportunities are removed to become more prosperous through trade and investment between states, key incentives are also removed to keep the peace.

Interdependence is no panacea, but nor is securitization, which imposes only binary options and counterintuitively undermines deterrence. Liberal trade matters. Trade has been the lifeblood of the Asian region. And the shock and

disruption to trade from high tariffs has been costly and destabilizing.

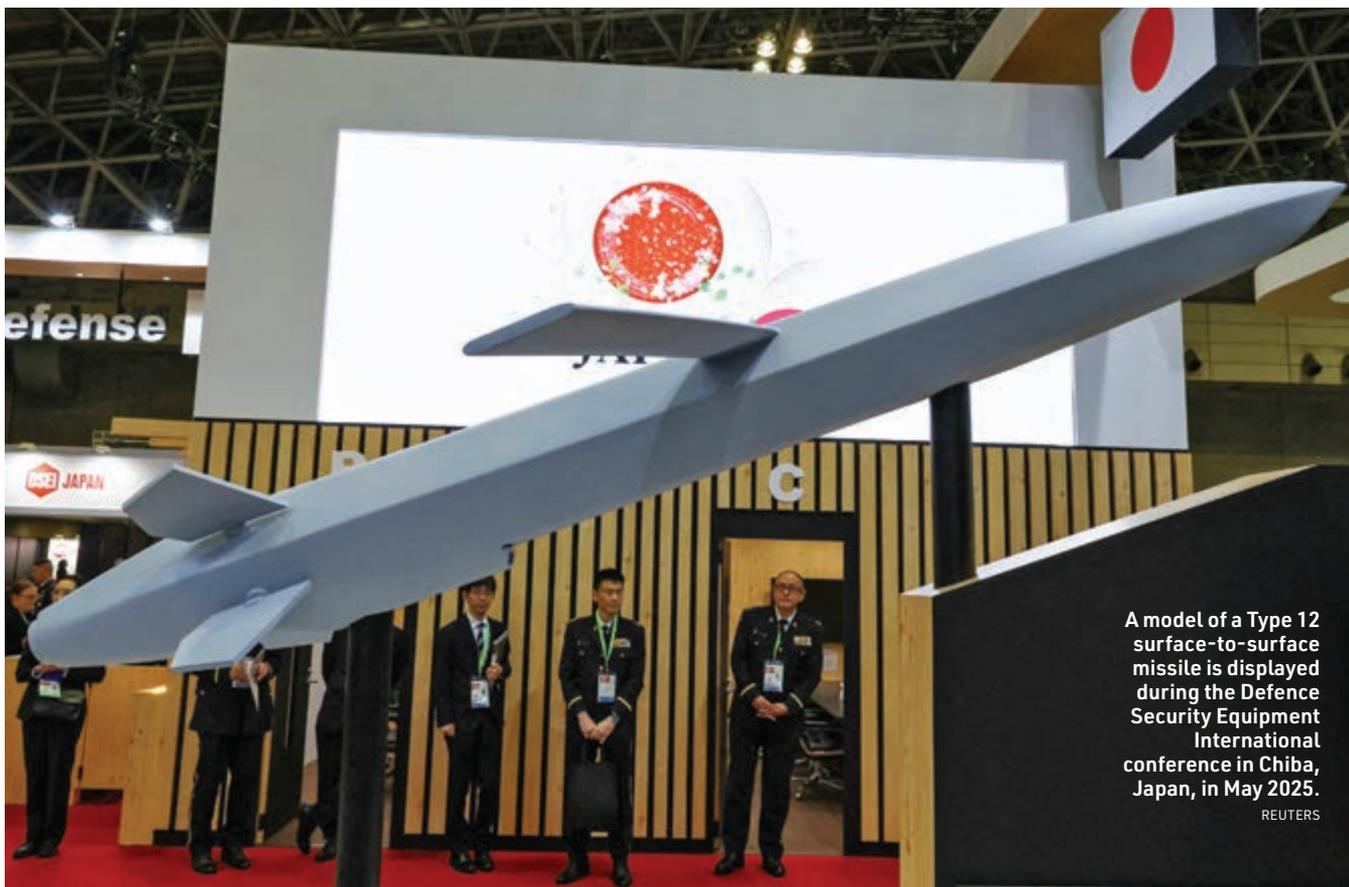
Australia will always ensure due attention is paid to the requirements of security. And likewise, we will continue to advocate for closer regional trade and investment integration, for the free flow of people and ideas, and for investing in the region's unique multilateral structures that support all this – above all, ASEAN [Association of Southeast Asian Nations] and the Pacific Islands Forum.

When I attended the dialogue last year, I was struck by [Indonesian] President [Prabowo Subianto's] speech in which he said the nations of the world both depended on and demanded the wisdom and statesmanship of great powers. No fact illustrates President [Subianto's] point more acutely than the reemergence of strategic nuclear competition and the technological tools that makes this competition even more dangerous.

A stable and durable regional order, inclusive of urgent arms control requirements, won't be possible unless all countries pursue their strategic aims in a manner that respects the sovereign rights of others, the obligations imposed by international law and the global rules-based order. The effectiveness of such arms restraints will ultimately be the test of our times.

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Access the full speech as delivered at <https://www.minister.defence.gov.au/speeches/2025-05-31/address-2025-shangri-la-dialogue-plenary-session-3-managing-proliferation-risks-asia-pacific>



A model of a Type 12 surface-to-surface missile is displayed during the Defence Security Equipment International conference in Chiba, Japan, in May 2025.

REUTERS

# JAPAN Looks to Deepen International Defense Cooperation

REUTERS

Japan opened one of its largest-ever arms shows in May 2025 in a display that then-Defense Minister Gen Nakatani said marked the nation's deepening push for overseas defense cooperation and weapons exports.

The Defense and Security Equipment International (DSEI) Japan exhibition near Tokyo showcased Japanese missiles, warships and research into lasers and electromagnetic railguns. The event, double the size of the 2023 show, drew 471 firms from 33 countries, including 169 from Japan – twice as many as two years ago, according to organizer Clarion Defence & Security.

"I sincerely hope that this exhibition will provide a new opportunity for cooperation

and exchange between national delegations and companies, help sustain defense industry development, drive innovation and promote peace and stability," Nakatani said during a speech at the event.

Japan lifted a military export ban in 2014 and is taking its first steps into global defense cooperation encouraged by the United States and European partners eager to share development costs and tap Japan's industrial base.

"Strength comes from expanding and elevating the alliance's capabilities and capacity, which means leveraging our respective skills and our specialties in co-development, co-production and co-sustainment," U.S. Ambassador to Japan George Glass said

as he opened the DSEI U.S. pavilion.

Amid threats from China, North Korea and Russia, Japanese firms have become more willing to seek out military business.

"Our foundation goes back over 70 years with industry here. That's with the big and large heavy industry players, which makes sense, but we're seeing that now at multiple tier levels, Tier 1, Tier 2 companies, even startups," said William Blair, the regional chief in Asia and India for Lockheed Martin, which supplies F-35 stealth fighters, air defense radars and other equipment to Japan.

Japan's partnerships in Europe include the Global Combat Air Programme (GCAP) jet fighter project with Britain and Italy.

"With today's increasingly uncertain security environment, I believe we must respond not just domestically but with a broader international perspective," said Katsuyuki Nabeta, a general manager at the defense and space unit of Mitsubishi Heavy Industries, which is leading the Japanese portion of that advanced fighter project.

"We are pleased to have the opportunity to showcase our technologies and reach a wider audience," he said.

# BRITAIN PIVOTS TO NEW DEFENSE TECHNOLOGIES

REUTERS

The United Kingdom said in May 2025 that it would radically change its approach to defense to address threats from Russia, nuclear risks and cyberattacks by investing in drones and digital warfare rather than relying on a much larger Army to engage in modern combat.

Defence Secretary John Healey said the U.K.'s adversaries were working more in alliance, and technology was changing how war is fought.

"Drones now kill more people than traditional artillery in the war in Ukraine, and whoever gets new technology into the hands of their armed forces the quickest will win," he said.

British Prime Minister Keir Starmer commissioned a strategic defense review shortly after his election in July 2024, tasking experts with formulating a plan for the next 10 years.

The U.K. ranks alongside France as one of Europe's leading military powers. Its Army

helps protect NATO's eastern flank, and its Navy maintains a presence in the Indo-Pacific.

The Army, with 70,860 full-time trained Soldiers, remains the smallest since the Napoleonic era, and the government has said it needs to be reformed given growing strategic threats.

Under the plan accepted by the government, the U.K. will expand its fleet of attack submarines, which are nuclear-powered but carry conventional weapons, and will spend \$20.3 billion by 2029 to replace the nuclear warheads for its main nuclear fleet.

The country will build at least six new munitions plants, procure up to 7,000 British-made long-range weapons and launch new communications systems for the battlefield.

A Cyber and Electromagnetic Command will lead defensive and offensive cyber capabilities after British military networks faced more than 90,000 "subthreshold"

attacks in the past two years.

The review panel said it would not reduce the size of the armed forces, even as a greater emphasis is put on technology, but would increase the total number of regular personnel when funding allows. Healey said the number of full-time Soldiers would reach 76,000 in the next parliament.

"The moment has arrived to transform how we defend ourselves," Starmer told workers at BAE Systems' Govan shipbuilding site in Scotland, saying he would "end the hollowing out of our armed forces."

"When we are being directly threatened by states with advanced military forces, the most effective way to deter them is to be ready," he said.

The government described its policy as "NATO first," drawing on the strength of the Alliance's members, which means it would never fight alone.



BAE Systems' Govan facility personnel in Glasgow, Scotland, gather during a June 2025 visit from British Prime Minister Keir Starmer. REUTERS



## U.S. Golden Dome Missile Defense System Takes Shape

REUTERS

United States President Donald Trump picked a design for the Golden Dome for America missile defense system and named a leader of the \$175 billion defense program.

The aim is for Golden Dome to leverage a network of hundreds of satellites circling the globe with sophisticated sensors and interceptors to knock out incoming enemy missiles after they lift off from countries like China, Iran, North Korea or Russia.

### United States President Donald Trump speaks inside the Oval Office about his Golden Dome plan. THE ASSOCIATED PRESS

In April 2025, the U.S. Department of War asked military contractors to design and build a network to disrupt intercontinental ballistic missiles during the "boost phase" just after liftoff – the slow and predictable climb of an enemy missile through Earth's atmosphere. Existing defenses target enemy missiles while they travel through space.

Once the missile has been detected, the Golden Dome will either shoot it down with an interceptor or a laser before it enters space, or further along its path of travel in space with an existing missile defense system that uses land-based interceptors stationed in California and Alaska.

Beneath the space intercept layer, the system will have another defensive layer based in or around the U.S.

The idea of strapping rocket launchers, or lasers, to satellites so they can shoot down enemy intercontinental ballistic missiles is not new. It was part of the "Star Wars" initiative devised in the early 1980s by U.S. President Ronald Reagan, but it represents a huge and expensive technological leap from current capabilities.

President Reagan's Strategic Defense Initiative (SDI), as it was called, was announced in 1983 as groundbreaking research into a national defense system that could make nuclear weapons obsolete.

The heart of the SDI program was a plan to develop a space-based missile defense program that could protect the U.S. from a large-scale nuclear attack. The proposal involved many layers of technology that would enable the U.S. to identify and automatically destroy a large number of incoming ballistic missiles as they were launched, as they flew, and as they approached their targets.

## U.S. Champions Development of NEW UNCREWED SYSTEMS

UNITED STATES DEPARTMENT OF WAR

Emerging threats from peer and near-peer uncrewed systems (UxS) have reshaped the character of war, necessitating the development of new solutions at a faster pace. Warfighters require today's UxS to meet urgent operational needs. The United States Department of War's Defense Innovation Unit (DIU) is using a new and agile process to evaluate new technologies, involve warfighters early in development, and advance the prototyping, iterating, and fielding of technologies that can deliver operational advantage at speed.

Project G.I. will more rapidly identify, assess, iterate and integrate "ready now" autonomous solutions at scale for participating units. Platforms of interest include uncrewed aerial systems and supporting items.

"Today, warfighters lack the unmanned systems needed to train for combat and prevail if called upon to use them," said Doug Beck, then director of DIU. "DIU is laser focused on getting best-of-breed technology in the hands of the warfighter today and scaling it for training, adoption and readiness. Our team continues



An uncrewed surface system undergoes testing at Fort Benning, Georgia, in February 2025.

JOEY RHODES/U.S. ARMY

to partner with military operators for hands-on testing, evaluation and feedback. Doing this at speed will in turn help catalyze the necessary scaling and readiness through major acquisition and training efforts across the services that will deliver strategic impact – and will simultaneously support the flywheel of American private sector dynamism in delivering against that strategic need."

Project G.I. improves current programs of record by incorporating end-user feedback and slashing delivery timelines that can stretch years into the future. The effort will tap into high technical readiness level solutions in the small and medium uncrewed system industry, with a focus on less exquisite platforms well suited for rapid adaptation to military needs.

# INDO-PACIFIC NATIONS ACCELERATE DEFENSE PARTNERSHIPS, PRODUCTION

REUTERS

Spending on weapons and research is spiking among some Indo-Pacific countries as they respond to security threats by broadening their outside industrial partnerships and boosting their own defense industries, a study has found.

The annual Asia-Pacific Regional Security Assessment released in May 2025 by the London-based International Institute for Strategic Studies said outside industrial help remains vital even as regional nations ultimately aim for self-reliance.

"Recent conflicts in Ukraine and the Middle East, coupled with worsening U.S.-China strategic competition and deterioration of the Asia-Pacific security landscape, may lead to a rising tide of defense-industrial partnerships," it read. "Competitive security dynamics over simmering flashpoints ... feed into the need to develop military capabilities to address them."

Spending on defense procurement and research and development rose \$2.7 billion between 2022 and 2024, the study showed, to reach \$10.5 billion among Southeast Asia's key nations of Indonesia, Malaysia, the Philippines, Singapore, Thailand and Vietnam.

The spike came even as the nations spent an average of 1.5% of

gross domestic product on defense in 2024, a figure that has stayed relatively constant over the past decade.

The study said that Indo-Pacific nations still rely on imports for most key weapons and equipment.

Such items range from submarines and combat aircraft to drones, missiles and advanced electronics for surveillance and intelligence gathering.

Saudi Arabia and the United Arab Emirates are increasingly active and making inroads, the study said, though European companies have a prominent and expanding regional presence via technology transfer, joint ventures and licensed assembly deals.

Joint development operations are not always easy, the study said, offering lessons from India's two-decade collaboration with Russia to produce the BrahMos supersonic anti-ship missile.

While the missile is fielded by India, exports have been hampered by lack of a clear strategy, with deliveries to its first third-party customer, the Philippines, starting only in 2024, the study added.

Closer China-Russia ties could further complicate the weapon's development, particularly if Moscow chooses to prioritize ties with Beijing to develop a hypersonic version of the missile.

A model of the Upgraded Mogami-class frigate sits displayed during the Defence Security Equipment International conference in Chiba, Japan, in May 2025.

REUTERS



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