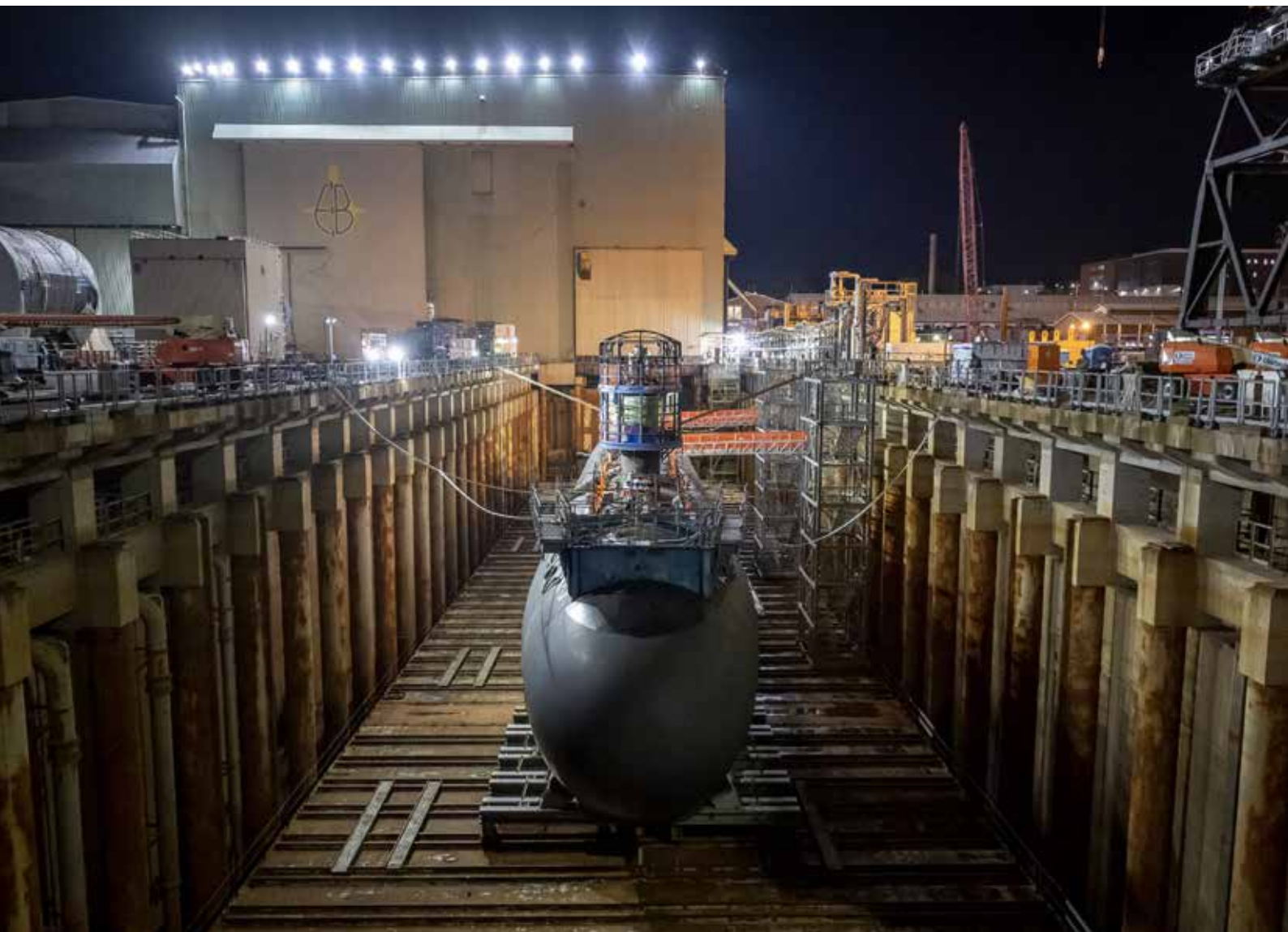




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# Federation is deterrence: The US defence industrial and technology integration agenda in the Indo-Pacific

7 Tom Corben and Sophie Mayo | March 2025





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Cover photo: The Virginia-class submarine Iowa sits in a graving dock at the Electric Boat shipyard in Groton, Connecticut, August 2023. (General Dynamics Electric Boat)

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# Executive summary

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- Over the past four years, defence industrial and technology cooperation have become the focus for America's efforts to modernise key alliances and strategic partnerships in the Indo-Pacific, particularly those with Australia, India, Japan, South Korea, and Taiwan.
- Though Washington has previously pursued greater defence industrial integration with these countries in the past, this agenda has assumed a new urgency in the wake of a number of sudden shocks and longer-standing challenges to the US defence industrial base.
  - Near-term challenges emanating from the COVID-19 pandemic, Russia's February 2022 invasion of Ukraine, and renewed operational commitments in the Red Sea and Mediterranean since October 2023 have called into question Washington's ability to meet both its own and its allies' material defence needs.
  - These shocks are compounded by legacy maintenance and production shortfalls and China's growing ability to contest US military logistics in Asia, posing serious challenges to America's strategic position in the Indo-Pacific.
- To address these challenges, Washington and its regional allies and partners seek to progress cooperation along three primary vectors: maintenance, repair and overhaul; co-production and defence supply chains; and defence technology development. Importantly, this has occurred not only at the bilateral alliance and partnership level but also at the multilateral level through initiatives like AUKUS, the Australia-Japan-US trilateral, and new mechanisms like the Regional Sustainment Framework and Partnership for Indo-Pacific Industrial Resilience.
- However, the United States and its allies and partners have also encountered a number of common obstacles to advancing this defence integration agenda, both within and between their respective systems. These include lingering barriers to defence trade and technology sharing; sluggish acquisition processes and insufficient innovation incentives; the over-classification of information and shallow supply chain visibility; the weaknesses and burdens of industrial security standards; and political tensions between onshoring and friend-shoring defence production.
- Notwithstanding these challenges, the election of the second Donald Trump administration and its willingness to pursue ambitious reforms to defence industrial policy and regulation provides an opportunity to capitalise on the strong foundation for defence industrial and technology integration with Indo-Pacific allies and partners laid to date. Broadly speaking, these efforts ought to focus on: institutionalising new information-sharing practices; deepening industry engagement; exploring collective industrial mapping and crisis simulation activities; harmonising defence industrial security measures; and reforming defence acquisition and trade practices to quickly deliver disruptive capabilities. a strong foundation for a defence industrial integration agenda with Indo-Pacific allies and partners to succeed.

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The election of the second Trump administration and its willingness to pursue ambitious reforms to defence industrial policy and regulation provides an opportunity to capitalise on the strong foundation for defence industrial and technology integration with Indo-Pacific allies and partners laid to date.

# Introduction

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In December 2024, then-United States National Security Advisor Jake Sullivan delivered an address to the Center for Strategic and International Studies, entitled “Fortifying the U.S. Defense Industrial Base.”<sup>1</sup> That Sullivan chose to give such a high-profile address on such a technical topic with approximately a month remaining in office, and after a highly eventful four years, was no coincidence. Indeed, it was reflective of America’s growing preoccupation with revitalising the US national defence industrial base (DIB), a pursuit which Sullivan cast as “a deeply strategic topic... for the future of American statecraft.”<sup>2</sup>

In large part, Sullivan used his address to reflect on the administration’s efforts to “modernize, invigorate and expand” the DIB through three “big pushes” — boosting munitions and shipbuilding production capacity, bringing more commercial technologies into the defence realm, and building “an integrated defense industrial base” with global allies and partners.<sup>3</sup> That alliances and partnerships warranted their own discussion was unsurprising. Indeed, the 2022 National Defense Strategy (NDS) identified a rejuvenated US defence industrial base, access to high technology, and America’s network of capable allies and partners as “enduring advantages,”<sup>4</sup> essential to meeting US objectives across the full spectrum of statecraft. Importantly, the Biden team saw these advantages not as mutually exclusive but as interdependent factors essential to American strategic success.

## The Biden administration’s successes and challenges

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The administration’s efforts to modernise and network America’s Indo-Pacific alliances and partnerships — particularly those with Australia, India, Japan and the Republic of Korea (ROK) — epitomised that view.<sup>5</sup> This included expanded bilateral collaboration with all four countries on federated maintenance, production and sustainment initiatives for aircraft, munitions, warships and unmanned systems; the creation of several signature industrial capacity-building and technology sharing initiatives, most notably the Australia-United Kingdom-United States (AUKUS) partnership and the India-US Defense Acceleration Ecosystem (INDUS-X); and the creation of new defence industrial-focussed minilateral forums like the Region-

al Sustainment Framework and Partnership for Indo-Pacific Industrial Resilience. For the most part, these initiatives have been intended to address China’s growing regional military power, identified by the 2022 NDS as the outright “pacing challenge” for the US Department of Defense and, by extension, defence industrial integration and technology collaboration with allies and partners.<sup>6</sup>

These efforts to prioritise China and the Indo-Pacific were both driven and tested by a range of domestic and global challenges, which, collectively, called into question America’s industrial capacity to meet both its own national priorities and its global security commitments. The lingering impacts of the COVID-19 pandemic on the American economy and workforce extended to the national DIB. Sustained material support for Ukraine in the face of Russia’s February 2022 invasion exposed shortcomings in America’s capacity to backfill depleted stockpiles and to produce even basic defence items at scale. A concurrent surge in military aid for Israel and a surge in protracted air and naval operations in the Mediterranean and the Red Sea — only years after the end of the US mission in Afghanistan — not only depleted already low stocks of strike weapons and air defences, but compounded with long-standing maintenance and sustainment shortfalls which had already degraded US military readiness in Asia. On top of industrial issues, the Indo-Pacific’s vast air and maritime geography and China’s rapid military modernisation have made for an increasingly contested military logistics environment, calling into question America’s capacity to credibly supply and sustain its own forces, let alone those of its allies, in a range of plausible pre-crisis or conflict scenarios.<sup>7</sup>

## The 2024 National Defense Industrial Strategy

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It was these compounding headaches that prompted the publication of the first-ever US National Defense Industrial Strategy (NDIS) in January 2024, a document intended to provide a roadmap towards “a more robust, resilient, and dynamic modernized defense industrial ecosystem.”<sup>8</sup> Though much of the document focusses on domestic reform and revitalisation, it also retains a distinct focus on the Indo-Pacific as America’s primary theatre of interest and on allies and partners as essential

inputs to American strategy, noting that realising “a modernized defense industrial ecosystem that is fully aligned with the NDS” would be contingent on deeper integration with those countries.<sup>9</sup> Indeed, the NDIS frames such cooperation as central to three of the four long-term strategic priorities — building resilient supply chains, developing more flexible acquisition systems, and bolstering economic deterrence — while it is closely related to achieving the fourth — enhancing workforce readiness (see Table 1). Encouragingly, progress has been made on all six of the specific implementation initiatives outlined in the June 2024 NDIS Implementation Plan — including shoring up the US submarine industrial base, expanding missile production for “Indo-Pacific Deterrence,” and correcting long-standing maintenance and sustainment imbalances — hinges on allied and partner contributions.<sup>10</sup>

Yet much work remains to be done if the United States, under a second Donald Trump administration, is to fully capitalise on the comparative advantages that US Indo-Pacific allies and partners can bring to bear in support of shared regional objectives. For America and its allies and partners alike, realising the promise of greater defence industrial integration in the Indo-Pacific will require addressing several cross-cutting challenges. These include: (but not limited to): reforming outdated defence trade controls; revising information classification standards across different military services and departments; removing barriers to private sector participation in US and allied defence markets; reforming and harmonising acquisition procedures, including equipment specification standards and tender processes; right-sizing cybersecurity requirements; enhancing collective defence supply chain domain awareness; and insulating critical defence industrial and technology collaboration from excessive protectionism.

## Over to you, Trump 2.0

As Sullivan himself noted at CSIS, while the Biden administration had “made progress over the last four years... frankly, we need progress over the next 40.”<sup>11</sup> In the first instance, it will fall to the second Donald Trump administration to carry this agenda forward. At the time of writing, the precise contours of American defence strategy under Trump 2.0 remain unclear, with robust debates underway with-

in and between the new administration, Congress and the broader policy community over how best to right-size US global strategy and to radically reform the American defence establishment that has proven slow to adapt to a new era.<sup>12</sup> At the same time, the various camps within these debates all agree on the need to better position America for military competition with China and, by extension, on the need to continue to revitalise the US defence industrial base in the pursuit of what President Trump and his national security team have broadly referred to as “peace through strength.”<sup>13</sup> Whichever way it chooses to implement that concept in practice, and to what extent the maxim “production is deterrence” informs that concept, the new administration will ultimately need to consider how best to leverage defence industrial integration and technology collaboration with Indo-Pacific allies and partners to meet those objectives.

In that spirit, this report seeks to assess the recent history of US-allied defence industrial integration in Asia to offer lessons for the near future. It begins with a discussion of the main drivers of that agenda, unpacking the challenges posed to America’s strategic position in Asia by the effects of COVID-19, major conflicts in Europe and the Middle East, legacy maintenance and sustainment challenges, and the contested logistics environment in the Indo-Pacific. It then examines how the United States has sought to advance bilateral and minilateral defence industrial and technology collaboration with Australia, India, Japan, South Korea and others over the last four years as part of wider efforts to modernise its own national defence industrial case, focussing on developments relating to: maintenance, repair and overhaul (MRO); co-production and supply chains; and defence technology collaboration. The report identifies several common challenges that have presented themselves across these various partnerships, before concluding with a series of recommendations for policymakers in all five capitals to consider as the Trump administration embarks upon its own efforts to reinvigorate the US DIB, bolster deterrence in the Indo-Pacific, and advance defence industrial and technology cooperation with allies and partners.

**Table 1.**

**Role of allies and partners in the four long-term priorities of the United States’ 2023 National Defense Industrial Strategy**

<b>2023 NDIS priority</b>	<b>Role of allies and partners</b>
Resilient supply chains	“Proactively developing, growing, and sustaining multiple, redundant, production lines across a consortium of like-minded nations is imperative for the U.S. to ensure adequate production capability and capacity while mitigating exposure to supply disruptions or changing production requirements. The DoD must develop a networked cooperative framework that enhances defense industrial output by working with allies and partners to de-risk supply chains and advance our ability to engage in cosustainment, maintenance, repair, and overhaul.”
Workforce readiness	“Labor continues to be a major challenge for industry as baby boomers retire and younger generations generally show less interest in pursuing manufacturing careers or lack the science, technology, engineering, and math (STEM) skills needed for industrial work. The labor market lacks sufficient workers with the right skills to meet domestic production and sustainment demand. This directly affects military readiness.” “The characteristics of navy shipbuilding and sustainment impose unique workforce requirements on the industry, with its most acute defense-related workforce challenges tied to nuclear submarine production... the domestic shipbuilding industry is struggling to maintain an adequately sized and skilled workforce.”
Flexible acquisition	“Standards, modularity, and interoperability are crucial elements that enable mutual support and collaboration within the global defense industrial ecosystem. These benefits include resource sharing, research, manufacturing, expertise exchange, technology transfer, and the development of common platforms. By working together effectively, we and our allies and partners can address capacity and capability gaps, enhance production capacity and capabilities, boost economic advantages, and reinforce alliances.”
Economic deterrence	“The DoD should focus on leveraging existing bilateral and multilateral relationships, such as NATO, AUKUS, and the NTIB, and focus on sourcing from countries that are geopolitical allies (“friend-shoring”) to reduce reliance on potentially adversarial or unstable nations for critical defense and strategic materials.” “The DoD will work with other federal agencies, including the Departments of State and Commerce, to enhance existing alliances and generate new and emphasize existing mechanisms for sharing technologies and applications of scientific knowledge with other partners and allies.”

Source: United States Department of Defense.

# 1. Drivers of the industrial integration agenda

To be sure, many of the challenges afflicting the US DIB are not necessarily new, predating both the Biden and Trump administrations, respectively, by many years. Since the end of the Cold War, scholars and US Government departments alike have long warned of a steady atrophy of US national defence industrial capacity, including the consolidation of defence production capacity in the 1990s and subsequent creation of bottlenecks for key components, the steady deterioration of force readiness, procedural and regulatory impediments to innovation and procurement, political ceilings and legal constraints of defence spending, and so on. Even as defence policy experts took greater interest in these challenges amid China's own growing industrial capacity, military power and technological sophistication, a relatively benign global strategic environment (notwithstanding protracted US and coalition military campaigns in Iraq and Afghanistan) meant that many of these issues were left unaddressed or unexposed while those that did receive attention experienced only incremental changes or improvements.

However, beginning in early 2020, a series of major shocks brought these challenges to the forefront of American — and allied — defence policy debates, exaggerating preexisting vulnerabilities and/or uncovering new weaknesses or challenges. The need to respond to these challenges that has driven Washington's recent efforts to advance defence industrial and technology cooperation with key allies in the Indo-Pacific. These shocks included the impacts of the COVID-19 pandemic on US supply chains and workforce, and the industrial pressures of unplanned and protracted military support for partners confronting aggression in Europe and the Middle East. These challenges compounded with longer-standing issues relating to legacy air and naval readiness and sustainment backlogs, and the increasingly contested nature of the military logistics environment in the Indo-Pacific theatre as China's air, naval and strike capabilities have grown in size and sophistication, pressuring America's ability to sustain its forces and those of its partners in the event of hostilities.



Source: US Army



## a. COVID-19

Firstly, the COVID-19 global pandemic underscored the brittleness of important defence supply chains and exacerbated existing readiness challenges, including maintenance, repair and overhaul (MRO), driven in large part by the resultant strain on America's workforce.<sup>14</sup>

### Supply chains

Most glaringly, the pandemic laid bare the fragility of global supply chains, uncovering key gaps in the US industrial base and an overdependence on foreign manufacturing for key inputs.<sup>15</sup> An official action plan released in February 2022 in response to President Biden's Executive Order 14017, entitled "Securing Defense-Critical Supply Chains," sought to identify gaps in supply chains relevant to microelectronics, castings and forgings, missiles and munitions, energy storage and batteries, and strategic and critical materials. The document outlined plans to secure these supply chains, including through actions like "build(ing) domestic production capacity."<sup>16</sup> For US defence companies, these pandemic-driven vulnerabilities have serious consequences on the availability of materials, subcomponents and other goods.<sup>17</sup> Lockheed Martin, for example, experienced a reduced capacity to build and sell F-35 fighter jets to customers, including the US Department of Defense.<sup>18</sup>

Following the pandemic, the administration and Congress enacted numerous initiatives designed to improve supply chain transparency and resilience; strengthen workforce development and lift support for small businesses in the defence industrial base.<sup>19</sup> This included the pursuit of legislative reforms such as the Bipartisan Infrastructure Law, which enabled domestic investments in supply chains for critical dual-use technologies of importance to national security.<sup>20</sup> Meanwhile, the House Armed Services Committee established a critical supply chain task force to review defence industrial supply chains and "identify and analyse threats and vulnerabilities."<sup>21</sup> Among other recommendations, the task force ultimately suggested the DoD "treat supply chain security as a defence strategic priority."<sup>22</sup> This call was heeded with the release of the Biden administration's National Defense Industrial Strategy,

which identified "supply chain resilience" as the first of four long-term priorities for the US defence industrial base.<sup>23</sup>

### Workforce

The pandemic had equally devastating effects on America's defence industrial workforce, forcing changes to the way people work and in doing so prompting many to consider new career paths with different working conditions or early retirement.<sup>24</sup> These challenges were compounded by a pre-existing "aging" out of much of the DIB workforce, with a 2023 McKinsey and Company study noting one-third of US defence industry employees are age 55 or older.<sup>25</sup> The net effect of these shifts was that naval shipyards and other critical defence industrial workplaces could not operate at capacity during and after the pandemic, producing new or extended delays to important capability production and modernisation initiatives.<sup>26</sup> Delays to the construction of Virginia-class submarines is one notable example. Company spokespeople from Newport News Shipbuilding have publicly stated that COVID-related workforce challenges and subsequent staff shortages up and down the Virginia-class supply chain prompted the Navy and its two major manufacturers for the boats to redraw the schedule for production of Block V.<sup>27</sup> After the pandemic, Navy officials have attributed ongoing workforce shortages in the defence industrial base to the declining wage gap between blue-collar jobs in hospitality and companies such as Amazon.<sup>28</sup>

COVID-related workforce shortfalls also had flow-on effects for US allies and partners. For example, workforce shortages produced notable delays in the production, maintenance and sustainment of US Virginia Class submarines — the model that Australia plans to purchase from the United States under Phase II of AUKUS Pillar I.<sup>29</sup> Indeed, a June 2023 US Government Accountability Office report said that workforce shortages amplified by the pandemic had produced an additional two years of delay to the Block V Virginia class.<sup>30</sup> To address these challenges, the Biden administration introduced a range of talent retention and recruitment measures, including introducing a US Navy Talent Pipeline Program and supporting increases in remuneration and benefits for shipyard workers,<sup>31</sup> though these initiatives will take time to realise their full effects.

## b. Global security commitments

On top of the pandemic, simultaneous conflicts in Europe and the Middle East put additional pressure on an already strained DIB. As these conflicts have dragged on, they have stretched America's capacity to simultaneously resource allies and partners on the frontlines of conflict in secondary theatres while simultaneously maintaining the readiness levels and weapons stockpiles required to underwrite US deterrence strategy in its primary theatre of interest, the Indo-Pacific.

### Ukraine and Europe

Whichever way one looks at it, Washington's consistent material support for Ukraine in the face of Russia's invasion exposed acute supply bottlenecks for key military systems and the inadequacy of "just in time" delivery models to meet wartime demands, particularly with respect to munitions. Between February 2022 and January 2025, Washington provided over US\$66.5 billion in military aid, including thousands of rounds for air defences, High Mobility Artillery Rocket Systems (HIMARS), Javelin anti-armour systems, and Stinger anti-air systems; over three million rounds of 155mm artillery ammunition and over one million 105mm artillery rounds; and large numbers of other in-demand systems.<sup>32</sup> In order to meet the urgency of these requirements and to buy time for industry to surge its capacity to meet sudden requirements, the Biden administration primarily utilised Presidential Drawdown Authorities to supply Ukraine with materials directly from US war stocks. Though industry was able to improve

its production capacity for certain capabilities, over time these efforts reduced US inventories for key munitions to close to minimum war planning and training requirements.<sup>33</sup> This generated considerable debate over whether protracted support for Ukraine would undermine US or allied warfighting potential in the Indo-Pacific, including amongst figures likely to join the second Trump administration.

As the range and sophistication of US weapons transfers to Ukraine has expanded, so too has the number of defence industrial challenges increased. This has been especially evident with respect to munitions. In January 2023, experts projected that it would take more than five years to upgrade production capacity for 155mm artillery shells, Javelin anti-tank weapons and Stinger anti-air missiles — all essential to Ukraine's defensive efforts — at levels required to replenish US reserves based on prevailing consumption rates.<sup>34</sup> While the US had previously maintained a more robust production capacity for these capabilities, this had atrophied following the end of the Cold War and amid in US operations in the Middle East. For example, US Javelin production had contracted by two-thirds between 2009 in 2013 in response to a pause in US military campaigns in Iraq and Afghanistan, while HIMARS production had been paused altogether between 2013 and 2017,<sup>35</sup> with neither capability enjoying a significant expansion of manufacturing capacity to meet new demands. While the production of HIMARS launchers was on track increase from 60 to 96 per year by the end of 2024,<sup>36</sup> demand for these systems globally — not just in Ukraine — has increased significantly in recent years (see Table 2), raising questions over America's capacity to supply its allies with the weapons they require to contribute to upholding deterrence.

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This generated considerable debate over whether protracted support for Ukraine would undermine US or allied warfighting potential in the Indo-Pacific, including amongst figures likely to join the second Trump administration.

**Table 2.**

**Publicly announced HIMARS sales/transfers approved since February 2022**

Country	Number of launchers
Australia	22
Estonia	6
Germany	3
Italy	21
Latvia	6
Lithuania	8
Morocco	18
Netherlands	20
Norway	16
Poland	18
Ukraine*	40

Source: United States Department of State.

\* Includes transfers made from US reserves under Presidential Drawdown Authority; figures approximate based on Pentagon reporting.

The Ukraine conflict also highlights the perils of industrial base consolidation and the creation of acute supply bottlenecks for critical components. This rings true across both the organic industrial base — the portion of US industrial capacity owned and operated by the government — and private industry, and particularly for precision-guided munitions. More so than complete capabilities themselves, it is shortages of such components that have had a direct bearing on US resources and planning in other global theatres. Manufacturing and supply shortages for rocket motors are a case in point, with only two certified suppliers able to meet production demands for a wide range of defensive and offensive missile systems beyond those employed in Ukraine,<sup>37</sup> placing demand for legacy system componentry for capabilities like the Javelin in direct competition with those needed for air and maritime precision guided munitions production.<sup>38</sup> This effected not only delivery timelines for completed capabilities but the rate at which other elements of the US DIB could reconstitute. For example, though

annual guided multiple launch rocket (GMLR) production increased from 6,000 to 10,000 within the first 12 months of the war year,<sup>39</sup> industry predicted that it would take another two years to further double production to 20,000 given intense competition for “machine tools, skilled labor, and parts” between multiple classes of precision-guided munitions.<sup>40</sup>

In response, Congress and the White House took considerable steps to address these supply crunches. In February 2023, a Pentagon memo indicated that the department was undertaking “munitions industrial base deep dives” targeted specifically at enhancing production capacity for “integrated air defense systems” and “long-range fires.”<sup>41</sup> Meanwhile, Congress extended multi-year purchasing authorities, traditionally reserved for major weapons platforms like warships, to precision munitions in the FY23 *National Defense Authorization Act*, and subsequently granted six of eight multi-year munitions contracting requests in the Pentagon’s FY24 budget,<sup>42</sup> including for several with clear application to the air and maritime domain in the Indo-Pacific.<sup>43</sup> The US Army has also awarded billions in contracts for 155mm and GMLR production since 2023 to meet Ukrainian and US inventory demands,<sup>44</sup> including through outsourcing to allied countries.<sup>45</sup>

Despite this progress, however, the United States has encountered difficulties in ramping up production to meet Ukraine’s battlefield needs, let alone its own inventory requirements. The Pentagon has enjoyed some notable success in surging production capacity for 155mm artillery shells,<sup>46</sup> and is on track to up production from a pre-war level of 25,000 units a month to 100,000 units a month by October 2024.<sup>47</sup> Yet even in coalition with other Western producers, this would still fall short of even more conservative estimates of Ukraine’s battlefield requirements, and would constitute only 40% of Russia’s estimated monthly 155mm output.<sup>48</sup> Undersecretary of Defense for Acquisition and Sustainment William LaPlante noted in congressional testimony in February 2024 that “the tyranny of lead time” remained a considerable challenge for precision weapons like the Javelin, Stinger, and GMLR, with production timelines remaining at “two to three years” given the complexity of these systems.<sup>49</sup> This was a particularly sobering assessment, given that unclassified wargaming had shown that US stockpiles of precision munitions relevant to high-end contingencies in Asia would likely be exhausted in less than a week of fighting.<sup>50</sup>



Under Secretary of Defense for Acquisition and Sustainment Bill LaPlante at a press briefing at the Pentagon, September 2022. Source: US Department of Defense

Though the Ukraine war has exposed weaknesses within the US defence industrial base, for the Biden and now Trump administration — as well as US allies and partners in Asia — Ukraine has provided sober, albeit useful, lessons about the utility of asymmetric unmanned aerial vehicles (UAVs) in modern warfare, commonly referred to as drones. Over the course of the conflict, UAVs have become ubiquitous, largely because of their cost-effectiveness and ability to elevate “dumb artillery rounds” into more effective weapons.<sup>51</sup> In fact, there is evidence to suggest the fielding of drones en masse supports enhances air defence against Russian missile strikes.<sup>52</sup> This dynamic may bear some wisdom for Taiwan and those with an interest in deterring a Chinese attack over the Taiwan Strait. Though it is highly unlikely UAVs would be sufficient on their own to deter a Chinese attack, officials such as Admiral Pap-

aro, Commander of US Indo-Pacific Command, have implied deploying swarms of unmanned systems over the strait would “buy time” for the deployment of traditional assets in the event of a Chinese invasion.<sup>53</sup> Other former senior US officials, including Michèle Flournoy, who served as Under Secretary of Defense for Policy, have added that augmenting traditional assets with a mass of “relatively cheap unmanned systems” could compensate for China’s geographic advantage in the Indo-Pacific.<sup>54</sup> The promotion of attritable, unmanned systems will likely fall on open ears with the Trump administration and, in particular, Elon Musk, who presides over the new Department of Government Efficiency (DOGE). Musk previously voiced his disdain for traditional systems like the F-35, arguing they have become obsolete with the rise of unmanned systems.<sup>55</sup>

## Israel, the Red Sea and the Middle East

Unanticipated and increasingly protracted military operations in the Middle East have worsened industrial pressures associated with Ukraine. Arguably more so than conflict in Europe, renewed and protracted air and maritime operations in the Middle East have underscored how US global security commitments are putting pressure on its industrial capacity vis-à-vis requirements in Asia. To its credit, the Biden administration had made considerable efforts throughout its first three years in office to minimise America's military presence across the region, ending so-called "forever wars" to focus on challenges posed by China and Russia.<sup>56</sup> Beyond withdrawing all US forces from Afghanistan by August 2021, the Biden team also relocated or withdrew many high-end ballistic missile defence systems, naval, air force and surveillance assets away from the Persian Gulf to "answer military needs elsewhere around the globe,"<sup>57</sup> including many of those deployed to the Middle East in the final year of the Trump administration to manage escalation dynamics with Iran. The absence of a major regional conflict before Hamas's attack on Israel in October 2023 led Jake Sullivan to opine for *Foreign Affairs* that the administration's "disciplined approach" and risk reduction measures in the Middle East had strengthened America's hand to respond to more pressing global priorities.<sup>58</sup>

Since then, however, renewed defence commitments in the Middle East have sapped US defence industrial strength and military readiness in three main ways. Firstly, the surge in material assistance for Israel forced the administration to draw on the Pentagon's own stockpiles of munitions, including those of other regional combatant commands. Indeed, to meet Tel Aviv's initial requirements for 155mm ammunition, Washington was forced to tap stockpiles nominally reserved for US European Command (albeit based in Israel), known as War Reserve Stocks for Allies-Israel (WRSA-I).<sup>59</sup> This meant that tens of thousands of stockpiled shells originally earmarked for delivery to Ukraine were subsequently redirected to Israel ahead of anticipated ground operations in the Gaza Strip.<sup>60</sup> The decision to reallocate these munitions came at a time when Ukrainian forces were experiencing acute 155mm shortages in the face of multiple Russian assault vectors, and when 155mm supplies across NATO and other aligned countries were reaching "the bottom of the barrel."<sup>61</sup>

Secondly, US forces have expended hundreds of high-end strike and air defence missiles in the defence of Israel and in prosecuting two concurrent air and maritime operations in the Red Sea (Prosperity Guardian, a multinational effort to protect commercial shipping; and Poseidon Archer, a combined US-UK strike mission targeting threats inside Yemen). Between November 2023 and July 2024, for example, the US Navy estimates that the warships in the Dwight D. Eisenhower Carrier Strike Group launched over 800 missiles: 155 standard missiles (US\$2-4 million per missile) and 135 Tomahawk land attack missiles (US\$2 million per missile), while its aircraft launched at least 60 air-to-air missiles and 420 air-to-surface weapons.<sup>62</sup> Many of these weapons have been launched against comparatively low-cost man-portable and unmanned systems, making for a highly unfavourable cost curve as these operations have continued. What's more, their high expenditure rates also raised concerns among senior US defence figures, including Indo-Pacific Commander Admiral Samuel Paparo and former Assistant Secretary of Defense for Strategy, Plans, and Capabilities Mara Karlin, as to whether the United States could simultaneously meet Israeli and Ukrainian requirements as well as US operational needs in the Indo-Pacific if conflicts in both regions dragged on indefinitely.<sup>63</sup>

Indeed, expenditure rates for certain munitions, including those relevant to prospective contingencies in Asia, have far exceeded both past and forecast procurement rates.<sup>64</sup> For instance, the US Navy expended over 80 Tomahawk land attack missiles in the opening days of its Red Sea Operations alone, amounting to 145% of Tomahawks procured the previous financial.<sup>65</sup> This mismatch between procurement and expenditure is not new. For example, the Pentagon procured only 80% of the 125 Tomahawks used in its 2017-2018 strike campaigns against Syrian Government targets in its 2018 and 2019 budgets.<sup>66</sup> These high consumption rates come at a time when a growing number of frontline allies in Asia, including Australia and Japan, are seeking to purchase hundreds of Tomahawks of their own,<sup>67</sup> raising questions about US capacity to meet both its own and its allies' needs. Indeed, previous shortages of Hellfire missiles, Joint Direct Attack Munition kits and Small Diameter Bombs during US Air Force campaigns against the Islamic State group in Iraq and Syria in 2016 caused US authorities to turn down allies' requests to purchase these same capabilities.<sup>68</sup>

**Table 3.****United States Standard Missile-3 Interceptor procurement since FY15**

Year	FY15	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	FY25
Requested	30	40	35	34	43	37	40	48	57	39	12
Procured	52	46	35	64	44	39	49	56	71	39	TBC

Source: United States Department of State.

**Table 4.****United States Tomahawk Land Attack Missile procurements over the last decade**

Year	FY15	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	FY25
Requested	100	100	100	100	0	90	203	60	53	34	22
Procured	243	149	196	100	0	90	122	70	68	34	TBC

Source: United States Department of State.

**Table 5.****United States Patriot interceptor procurement over the last decade**

Year	FY15	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	FY25
Requested	70	80	85	93	240	147	168	180	252	230	230
Procured	108	112	169	368	240	156	146	328	252	230	TBC

Source: United States Department of State.

Thirdly, US operations in the Mediterranean and Red Seas have produced additional sustainment costs on top of the Pentagon's already strained operations and maintenance accounts. In resourcing its initial regional surge in October 2023, and in the absence of a final defence budget for 2024, the Pentagon had no choice but to reprogram money from other operations and maintenance accounts, with the Pentagon estimating in January 2024 that an additional US\$1.6-\$2.2 billion would be required over the coming budget cycle to cover those unforeseen costs.<sup>69</sup> That estimate came before the deployment of additional major surface combatants, including two carriers, ballistic missile submarines, multiple destroyers, and fighter squadrons to the region in mid-2024 in response to Houthi attacks on commercial shipping and several large-scale drone and missile attacks on Israel by Iran and Hezbollah.<sup>70</sup>

Though seemingly manageable in isolation, in reality these deployments compound with preexisting trends in two key areas. Firstly, these unforeseen deployments put additional pressure on already

strained maintenance and sustainment programs. Several assets deployed on short notice to the Middle East were required to stay on station longer than intended, disrupting future deployment schedules and increasing their downstream maintenance costs.<sup>71</sup> Secondly, these deployments fit into a much longer timeline of US efforts to right-size its regional military footprint, with efforts to downscale force commitments since the 2018 National Defense Strategy persistently disrupted by fresh crises. Indeed, the pattern of deployment, withdrawal and redeployment of high-end US missile defence, fighter aircraft and naval assets to and from Central Command since 2018 is instructive of the enduring drain of Middle East operations on US combat resources and, by extension, on its military industrial capacity (see Table 6). This pattern has occurred despite the evident consensus between the Trump and Biden administrations regarding the need to prioritise near-peer competition with China and Russia over operations in the Middle East.

**Table 6.****Select US deployments and withdrawals from the Middle East since 2018**

Month/Year	In/Out	Description
October 2018	Out	Four Patriot batteries removed from Jordan, Kuwait and Bahrain. <sup>72</sup>
May 2019	In	One Patriot battery, one bomber squadron, and additional fighter and reconnaissance aircraft deployed to the Persian Gulf. <sup>73</sup>
September 2019	In	One Patriot battery deployed to Saudi Arabia. <sup>74</sup>
	In	The US leads the formation of the International Maritime Security Construct to combat Iran-backed attacks on energy shipping.
October 2019	In	Two Patriot batteries, one THAAD battery, and two squadrons of fighter aircraft deployed to the Gulf region. <sup>75</sup>
January 2020	In	6 B-52 bomber aircraft deployed to Diego Garcia for Middle East operations. <sup>76</sup>
May 2020	Out	Four Patriot batteries removed from the Persian Gulf. <sup>77</sup>
April 2021	Out	Three Patriot batteries withdrawn from across the region, including one from Saudi Arabia. <sup>78</sup>
June 2021	Out	Eight Patriot batteries withdrawn from Iraq, Kuwait, Jordan and Saudi Arabia, as well as one THAAD battery from Saudi Arabia. <sup>79</sup>
July 2023	In	The Pentagon orders the deployment of F-35 squadrons to counter Iranian and Russian activity. <sup>80</sup>
September 2023	Out	The Pentagon orders the withdrawal of F-35 squadrons deployed to counter Iranian and Russian activity in July 2023. <sup>81</sup>
October 2023	In	The Pentagon announces the deployment of a THAAD system and six additional Patriot batteries “to locations throughout the region,” bringing the total Patriots deployed in the region to 12 — two thirds of the US Army’s total Patriot capability. <sup>82</sup> The Dwight D. Eisenhower Carrier Strike Group is also reassigned from a scheduled deployment to the Eastern Mediterranean for dual-carrier operations. <sup>83</sup>
November 2023	In	Dwight D. Eisenhower (IKE) Carrier Strike Group (CSG) and a ballistic missile submarine deploy to the Middle East. <sup>84</sup>
January 2024	Out	USS Gerald Ford departs the Middle East after three deployment extensions since October 2023. <sup>85</sup>
June 2024	In	The USS Theodore Roosevelt Carrier Strike Group deployed to the Middle East.
July 2024	In	USS Wasp Amphibious Ready Group / Marine Expeditionary Unit (ARG/MEU) deploys to the Eastern Mediterranean, diverting it from a scheduled deployment to EUCOM. <sup>86</sup>
August 2024	In	12 F-22 fighter aircraft, a ballistic missile submarine, and USS Abraham Lincoln Carrier Strike Group (carrier and two destroyers) deployed to the Middle East. The Lincoln was reassigned from its deployment in Asia. <sup>87</sup>
September 2024	Out	One of two remaining carrier strike groups deployed to the Middle East is withdrawn. <sup>88</sup>
November 2024	In	To compensate for the end of dual-carrier operations, the Pentagon announces the deployment of additional B-52 bombers, fighter jets, refuelling aircraft and Navy destroyers to the Middle East. <sup>89</sup>
December 2024	Out	F-22s deployed in September withdrawn from deployment. <sup>90</sup>

Source: United States Department of Defense.

## c. Legacy readiness issues

### **Air Force and Navy maintenance backlogs**

Many of the challenges afflicting the US defence industrial base predated the shocks of COVID, the war in Ukraine or renewed large-scale operations in the Middle East. Crucially for America's position in Asia, its Air Force and Navy continue to grapple with acute maintenance, production and sustainment challenges. A May 2023 Government Accountability Office report on overall US military readiness showed that while the Army and the Marine Corps had improved their maintenance rates over the preceding decade, the Navy and the Air Force continued to struggle. For example, 47 of 49 aircraft classes surveyed failed to meet mission capability goals between 2011 and 2021 due largely to supply chain shortages and unplanned or delayed maintenance requirements, with aerial refuelling, cargo and fighter classes faring the worst.<sup>91</sup> The F-35 Joint Strike Fighter has suffered in particular, with sustainment costs having increased by nearly 50% since 2018 even with reductions in flight hour estimates and other cost- and readiness-saving measures, while overall fleet readiness has struggled to exceed 60%.<sup>92</sup>

For the Navy, the increasing costs of maintaining primary surface combatants — destroyers and cruisers — have been compounded by major parts shortages and delays associated with both scheduled and unscheduled maintenance.<sup>93</sup> For instance, a separate GAO report in January 2023 noted that maintenance costs for a range of primary surface vessel classes increased by 25% between 2011 and 2020, even as the number of operational days for these same vessels decreased and instances of cannibalisation — borrowing parts from other assets rather than using new ones — had increased.<sup>94</sup> While some improvements have been made — 59% of vessels completed their maintenance on time in FY21, compared to 29% in FY19<sup>95</sup> — maintenance backlogs still figure as a major check on credible US naval power projection in Asia, putting a new premium on defence industrial collaboration with allies and partners to sustain a persistent and credible presence.<sup>96</sup>

### **The submarine maintenance and construction crunch**

Of particular interest to Australia is the construction and sustainment crunch afflicting the US Navy's nuclear-powered attack submarine (SSN) fleet. Though these challenges predated the September 2021 AUKUS agreement, they have received a high degree of scrutiny as the pathway for delivering Australia's SSN capability through Pillar I has taken shape. On maintenance, in 2023 the Congressional Research Service highlighted the steady increase in the number of US SSNs in depot maintenance or sitting idle as a percentage of the Navy's total inventory between 2012 and 2022, with a third of the total submarine fleet out of action at any given time.<sup>97</sup> Even as the overall force size remained relatively consistent across the decade, maintenance-related delays produced a corresponding decrease in the number of submarines available for deployment, due to workforce shortages and facility limitations.

Importantly, the same challenges that have produced SSN maintenance backlogs have compounded with efforts to increase submarine production to the level required to meet both Australian and US fleet requirements. The Navy's own "comprehensive shipbuilding review" released in April 2024 uncovered significant delays to both SSN and SSBN programs,<sup>98</sup> with supply issues for key components producing 12-16 month delays to the Columbia program

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**There is evident disagreement across the US system regarding the capacity of the submarine industrial base to take on additional work, let alone deliver on its current assignments.**





Staff Sergeant Michael Sanders of the 58th Aircraft Maintenance Squadron checks out an F-35A Joint Strike Fighter at Eglin Air Force Base, Florida. Source: US Air Force

this year and 2-3 year delays for the most up-to-date models of Virginia-class submarines.<sup>99</sup> While the Pentagon is proceeding with both programs under a '2+1' production schedule — 2 SSN and 1 SSBN per year — senior Navy officials have repeatedly stressed that the Columbia-class remains the Navy's singular top acquisition program, meaning that it would receive priority when it comes to allocating industrial or workforce resources relative to the Virginia-class program.<sup>100</sup> Indeed, a GAO January 2023 report noted that the priority status afforded to the Columbia-class program, and the tight window for seamlessly replacing the US Navy's existing SSBN fleet, had already resulted in shipbuilding staff originally assigned to Virginia-class construction being re-tasked, contributing to delays for that program. It also noted that long-term planning for both programs did not account for these sorts of shared risks "that are likely to present production challenges and could result in additional costs."<sup>101</sup>

The Biden administration moved to shore-up the submarine industrial base, with help from Australia. Yet there is evident disagreement across the US system regarding the capacity of the submarine industrial base to take on additional work, let alone deliver on its current assignments. On top of the US\$3.3 billion for the submarine industrial base passed in the long-delayed National Security Supplemental in April 2024 and a one-off US\$3 billion investment by Australia in that same year, the administration's FY25 budget request proposed US\$3.9 billion for next financial year and a further US\$11.1 billion across the coming five years to retool the US submarine industrial base to meet its new requirements.<sup>102</sup> However, Congress insisted on adding a second submarine to the final FY25 *National Defense Authorization Act*, an acquisition that the Biden team had omitted from its request citing current industrial capacity limitations.<sup>103</sup> This was met by a warning from Secretary of Defense Lloyd Austin in October 2024 that funding

an additional submarine in FY25 would quickly run-up against the realities of the production limitations of the submarine industrial base and make some of the Navy's other capability modernisation priorities, including its next-generation fighter jet, "unexecutable."<sup>104</sup> Following an additional supplemental funding request in November 2024 for USD7.3 billion in submarine construction costs — nearly 80% of which would go towards Virginia-class cost overages — Congress expressed concerns about the Navy's "lack of transparency" with the Hill and with the Office of Management and Budget about significant cost growths associated with SSN production, alleging that Congress was left "with few options to address this situation and likely none that will rectify it going forward."<sup>105</sup>

#### d. Contested logistics

Crucially, it has also become increasingly apparent that simply enhancing America's own defence industrial and technological outputs will be insufficient to counteract China's growing military capabilities in the Indo-Pacific. Given the well-established challenges facing US air and naval maintenance and sustainment and a growing appetite for munitions of all kinds amongst frontline allies and partners worldwide, American defence officials are increasingly cognisant of the value that US allies and partners' defence industrial capabilities — not just their access locations — can bring to bear in support of a resilient collective deterrence strategy and, potentially, in a range of imaginable high-end conflict scenarios.

The problem is both one of capacity and geography. American logistics and resupply capabilities need to traverse great distances of open water or air space between the continental US to reach major operating locations on US Pacific territories or allied nations, leaving them highly vulnerable to disruption by adversaries' anti-access and area denial systems, particularly subsurface and long-range strike capabilities. Though not an entirely novel challenge in the Indo-Pacific — General Douglas MacArthur observed during the Pacific campaign in the Second World War that "[v]ictory is dependent upon the solution of the logistics problem" — it is one which looms as a key determinant of the credibility of US

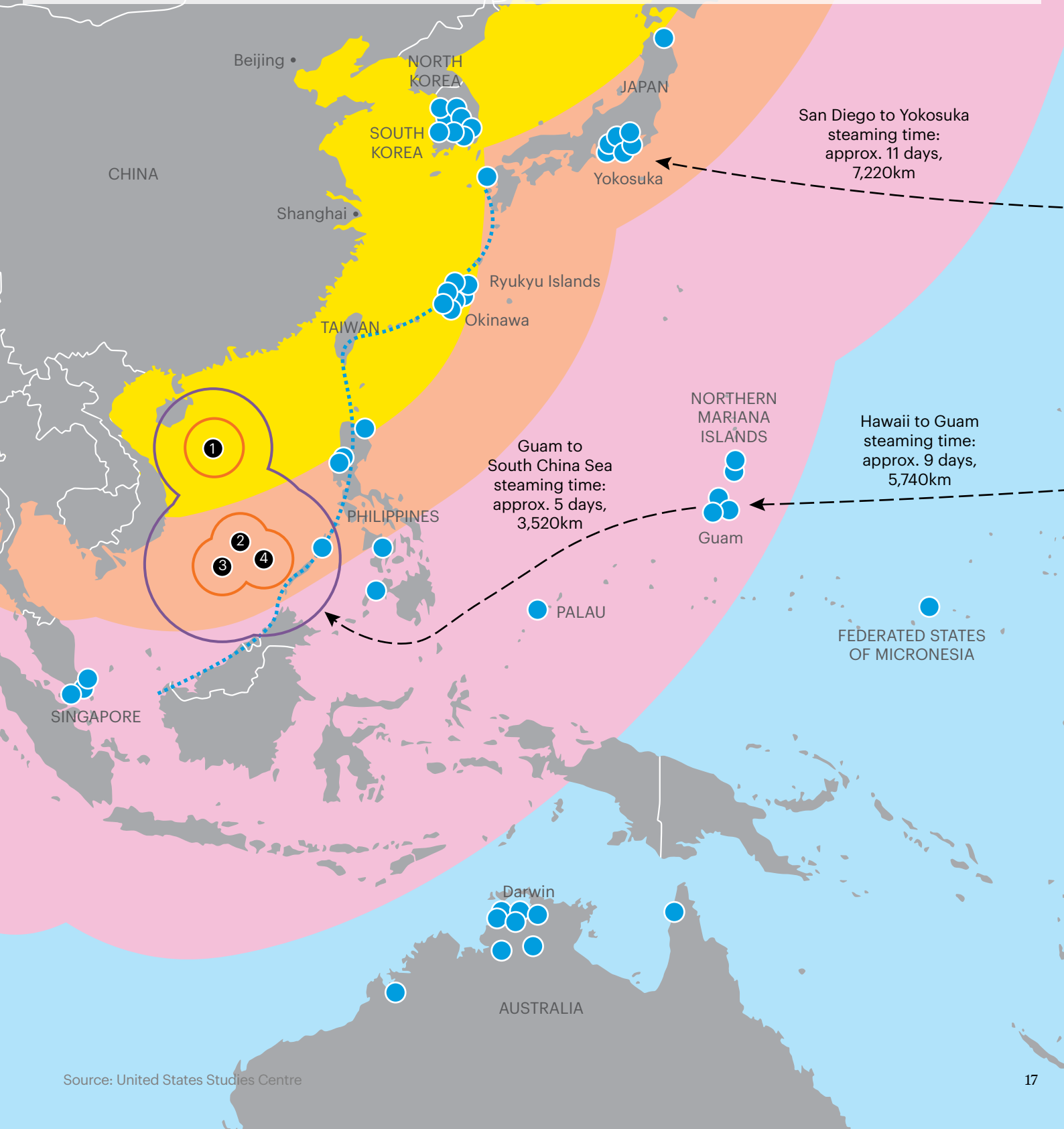
regional military strategy. Unlike bygone decades, the United States can no longer assume that it will have the freedom to "resupply forces carrying out high-tempo operations without fear of disruption,"<sup>106</sup> particularly when top US military officials have characterised the regional balance of power as one increasingly unfavourable to American interests.<sup>107</sup> These trends have placed a heightened premium not only on improving the survivability and distribution of US regional force posture but also on ensuring that dispersed units can continue to receive sufficient logistics and material support.

Perhaps unsurprisingly, top US military leaders have identified credible military logistics capabilities as "the key element of integrated deterrence" in Asia,<sup>108</sup> and the challenge of maintaining and sustaining US forces in this increasingly contested strategic space is one which has been identified as a "gigantic problem" by US military logisticians.<sup>109</sup> Indeed, while Chinese military capabilities necessitate the dispersal of operating locations away from large concentrated bases in Japan and South Korea, analysts have noted that such a distributed network of smaller bases may not prove to be any more resilient than present arrangements without means of adequate sustainment.<sup>110</sup> Furthermore, recent unclassified wargames have spotlighted "a lack of practical clarity" over how the US Joint Force would execute its logistics concepts across the region, even as these capabilities become an increasingly attractive target for would-be adversaries.<sup>111</sup> It is in that context that US officials and military planners have increasingly looked to regional allies and partners to sustain US combat power in new ways, including through shouldering maintenance and production requirements. In theory, access to robust allied defence industrial bases could allow Washington to "shorten the tail" between US combat units and their logistics and sustainment providers, thus increasing their resiliency and persistence.<sup>112</sup>

**Figure 1.**

**China's growing missile threat to US bases and regional access locations**

- Short-range ballistic missiles (SRBM) [DF-11A, DF15B]
- Medium-range ballistic missiles (MRBM) [DF-21A through E]
- Intermediate-range ballistic missiles (IRBM) [DF-26]
- Range of surface-to-air missiles
- Range of anti-ship cruise missiles
- US military base or access arrangement
- First Island Chain
- Steaming days
- 1** Woody Island
- 2** Subi Reef
- 3** Fiery Cross Reef
- 4** Mischief Reef



## 2. Advancing integration with allies and major partners in Asia

To offset these myriad challenges, the United States has increasingly turned to major allies and defence partners in the Indo-Pacific. Importantly, these efforts have gone beyond prevailing concepts of dispersing and diversifying the number of operating locations available to US forces across the region or improving the interoperability of combined forces. Rather, recent years witnessed Washington and its allies take notable strides towards integrating maintenance, repair, overhaul and co-production into their respective alliance or partnership defence arrangements.

To that end, among the hallmarks of the Biden administration's approach to alliances and partnerships in the Indo-Pacific were its efforts to advance discrete defence industrial and technology projects with its primary regional treaty allies and major defence partners: namely, Australia, India, Japan and South Korea. In doing so, the Biden administration proved relatively receptive to the proposals and requirements of its allies and partners, both in terms of 'stepping out' of the way of these countries' attempts to self-strengthen in the interests of collective security, as well as 'stepping in' to new and existing mechanisms intended to advance defence cooperation, including on industrial and technology issues.<sup>113</sup> Those developments can be broadly divided into three primary categories: developing greater in-theatre maintenance, repair and overhaul (MRO) capacity through facilities and workforce development; pursuing co-production arrangements for in-demand defence items, particularly munitions; and advancing new and existing defence technology co-development arrangements.

### a. Australia

It is arguable that Australia has become the poster child for US-allied defence industrial and technology integration. While AUKUS has dominated much analysis since its inception in September 2021, a broader suite of defence industrial and technology activities has redefined the art of the possible within a modern alliance framework.

#### **Maintenance, repair and overhaul**

Over the last four years, logistics and maintenance collaboration have assumed a greater place in the growing Australia-US defence cooperation agenda.

The Biden administration's first Australia — United States Ministerial Consultations (AUSMIN) in 2021 saw the announcement of the Combined Logistics Sustainment and Maintenance Enterprise (CoLSME),<sup>114</sup> intended to enhance responses to regional crises, bolster the interoperability of capabilities, support logistical challenges and opportunities in-theatre, promote defence infrastructure and improve the maintenance of fit-for-purpose capability.<sup>115</sup> The 2021 announcement was followed by logistical preparation "to support tactical operations," which notably included support for Marine Force Rotations in Darwin (MRF-D) and the prepositioning of US Army equipment to support joint training and exercises in Bandiana, Australia.<sup>116</sup> At AUSMIN 2023, Australian and American leaders announced plans to establish a permanent Logistics Support Area in Queensland.<sup>117</sup> Analysts posited these developments as essential for improving combined defence industrial preparation by enabling faster, more coordinated and more resilient response options to potential regional contingencies.<sup>118</sup>

Washington and Canberra have also taken steps to deepen naval MRO cooperation, with a particular focus on naval aviation and subsurface combatants. This has included certifying local Australian businesses to conduct deeper levels of maintenance and sustainment on common platforms, such as the P-8A Poseidon and MH-60R Seahawk 'Romeo' helicopter. In 2022, modification works were carried out at the Royal Australian Air Force's Base Edinburgh near Adeline to enable Boeing Defence Australia to complete in-country maintenance on its own — and potentially US — P-8A fleet.<sup>119</sup> The completion of these works provided an instant uplift to allied maintenance capabilities in-theatre, with the entire fleet of aircraft able to be maintained to a greater quality and at a greater cadence in-country, rather than having to transport the fleet to the United States to do so. From 2023, for instance, Sikorsky Australia was certified to complete "periodic maintenance inspection[s]" of US Navy MH-60R,<sup>120</sup> effectively providing a new option for in-theatre maintenance on a key capability.<sup>121</sup> These developments were framed by Australian military officers as spotlighting underutilised avenues for MRO collaboration across the region for key US decision-makers.<sup>122</sup>

Importantly, 2024 saw maintenance conducted on a US Navy nuclear-powered submarine USS *Hawaii* at HMAS Stirling in Western Australia, performed by

US and Australian Navy crew from the USS *Emory S. Land* and personnel from Royal Australian Navy (RAN) Fleet Support Units.<sup>123</sup> The Submarine Tendered Maintenance Period (STMP) was completed over multiple weeks, with US crew members largely providing support and supervision for their Australian counterparts, marking the first time since the Second World War that US submarine maintenance had been conducted in Australia, and was the first time a combined American-Australian team had performed maintenance on a nuclear-powered attack class submarine (SSN).<sup>124</sup> It also represented a significant improvement in Australia's ability to maintain and sustain SSNs ahead of receiving its own SSN fleet through AUKUS beginning in the 2030s.<sup>125</sup>

### Co-production and supply chains

Washington and Canberra also sought to advance or introduce a number of co-production and defence industrial supply chain initiatives, particularly in relation to the Guided Weapons and Explosive Ordnance (GWEO) enterprise. Originally announced in Australia in 2020, under the Biden administration, the partners sought to “institutionalise US cooperation” within GWEO,<sup>126</sup> to the extent that the enterprise now figures as a discrete alliance initiative.<sup>127</sup> Institutionally, this has involved the creation of a “multi-service roadmap” to guide ambitious development plans, and the planned establishment of a Joint Programs Office in 2025.<sup>128</sup> In practical terms, this has focussed largely on co-producing GMLRs in Australia by 2025 based on the achievement of various co-assembly and co-production milestones, including an agreement from Washington to transfer essential technical data to Australia to support those objectives.<sup>129</sup> Though criticised for their limited relevance to the Indo-Pacific theatre, officials on both sides have framed the GMLRs project as a “pipe cleaner” to streamline cooperation on more relevant models of missile. Indeed, to that end officials have already announced an additional GWEO project focussed on producing PRsM short-range ballistic missile training rounds.<sup>130</sup> Notwithstanding these positive developments, there remain challenges associated with scale and speed. For example, consternation remains about just how robust the business case is for producing GMLRS in Australia,<sup>131</sup> including challenges associated with building local economies of scale at price points attractive to Aus-

tralian and US customers alike.<sup>132</sup> While this issue could be alleviated by more significant US investment in Australian production, there is an ongoing question about how politically feasible this is for US interlocutors given protectionist pressures and (likely cheaper) domestic alternatives.<sup>133</sup>

### Defence technologies

Perhaps among the Biden administration's most notable alliance modernisation initiatives was the AUKUS (Australia-UK-US) technology sharing agreement. Announced in September 2021, AUKUS comprises two key lines of effort: the delivery of Virginia-class and, later, AUKUS-class nuclear-powered submarines to Australia in the 2030s and 2040s under Pillar I; and the rapid development of advanced asymmetric capabilities under Pillar II.<sup>134</sup> Most notably, March 2023 saw the release of the ‘Optimal Pathway’ for Pillar I, the roadmap for the development and delivery of AUKUS submarines.<sup>135</sup> Insofar as technology co-development is concerned, the optimal pathway outlines three distinct phases leading up to Australia and the UK's SSN-AUKUS acquisition, to be based on UK design and incorporating technology from all three nations, and inclusive of a bespoke technology-sharing memorandum between the all three countries authorising the sharing of sensitive nuclear propulsion technology with Australia.<sup>136</sup>

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Recent years witnessed Washington and its allies take notable strides towards integrating maintenance, repair, overhaul and co-production into their respective alliance or partnership defence arrangements.



The Albanese Government has agreed to build solid rocket motors in Australia, as part of its commitment to rapidly establish domestic manufacturing of Guided Weapons and Explosive Ordnance (GWEO). Source: Australian Department of Defence

Technology sharing and co-development efforts have also progressed through Pillar II. These activities have focussed largely on improving the interoperability and interchangeability of existing advanced capabilities operated by all three countries, many of which have had distinct maritime domain applications.<sup>137</sup> In 2024, for instance, the AUKUS partners deployed common advanced artificial intelligence (AI) algorithms on their respective P-8A Maritime Patrol Aircraft, enabling more rapid data processing, information-sharing and target identification in “congested acoustic environments.”<sup>138</sup> Relatedly, the three countries have sought to “scale up” the integration of torpedo-launched unmanned system capabilities onto current UK and US (and future Australian) submarines, integrating UK Sting Ray lightweight torpedoes onto P-8A alongside standard US Mk 54 variants to enhance interchangeability, and testing quantum clocks for maritime position, navigation and timing purposes.<sup>139</sup> Elsewhere, the AUKUS partners conducted several artificial intelligence (AI) and autonomy demonstrations, with the intention of supporting better decision-making

and improving combined military effects such as enhanced target location for unmanned land and air systems.<sup>140</sup> In November 2024, the three countries announced the Hypersonic Flight Test and Experimentation (HyFLiTE) Project Arrangement to facilitate the use of one another’s hypersonic testing facilities and the greater sharing of technical information to “develop, test, and evaluate hypersonic systems,”<sup>141</sup> effectively linking existing national and collaborative hypersonic weapon testing programs.

The AUKUS partners have also sought to establish forums for identifying and soliciting the best defence-relevant technologies on offer in all three countries, and for engaging prospective fourth parties to the overall agreement. Foremost among these was the 2024 Maritime Big Play series — described by officials as the Australian version of the US DoD’s Rapid Defense Experimental Reserve program — an initiative focused on domain-specific rapid technology pull-through and modernisation.<sup>142</sup> This series involved an “integrated experiments and exercises... designed to enhance capability development and improve interoperability,” including the joint oper-

ation of uncrewed maritime systems and the sharing and processing of real-time maritime domain awareness data.<sup>143</sup> For Australian dual-use companies, Maritime Big Play offered the chance to have technology evaluated by operators and officials from all three AUKUS countries, demonstrating Pillar II is concerned with providing opportunities for three-way technology transfer.<sup>144</sup> These opportunities built on the initial successes of AUKUS electronic warfare innovation challenges in all three countries, activities which had the effect of spotlighting world-class capabilities on offer in Australia, in particular, to the surprise of Canberra and Washington alike.<sup>145</sup>

AUKUS has also driven parallel efforts to reform US defence technology sharing regulations and to harmonise allies' own policy settings with Washington's. This included major (though incomplete) exemptions for Australia and the UK from licensing requirements of the International Traffic in Arms Regulations (ITAR) and the Department of Commerce's Export Administration Regulations (EAR),<sup>146</sup> carveouts long sought by Australian governments and industry alike. These reforms were accompanied by changes to Australian regulations to bring them into closer alignment with American standards, encapsulated in the *Defence Trade Controls Amendment Act 2024* and *Defence Trade Legislation Amendment Regulations*.<sup>147</sup> These measures were designed to streamline defence trade between the 3 countries through the removal of requirements for about 900 export permits, or about AU\$5 billion annually from Australia to the United States and the United Kingdom, in the interests of facilitating greater technology sharing through AUKUS Pillar I and II as well as the alliance's wider array of defence industrial initiatives.<sup>148</sup> In that respect, as the authors have summarised elsewhere, AUKUS Pillar II has become as much about procedural and regulatory reform as it has capability development.<sup>149</sup>

Canberra and Washington also sought to advance trilateral defence technology cooperation with Japan. For instance, in May 2024 the three countries concluded a trilateral Research, Development, Test, and Evaluation (RDT&E) Projects Arrangement to facilitate "operationally relevant advanced cooperation" on capabilities of mutual interest, including collaborative combat aircraft, autonomous systems and composite aerospace materials.<sup>150</sup> Meanwhile, Japan also participated as an observer in Exercise AUTONOMOUS WARRIOR within the Maritime

Big Play series, a step towards facilitating Japan's initial engagement with AUKUS through honing unmanned maritime system interoperability.<sup>151</sup>

Beyond AUKUS and the trilateral with Japan, Australia and the United States continue to make progress on hypersonic weapons development through the Southern Cross Integrated Flight Research Experiment (SCIFiRE) which commenced in 2007. This work includes research on hypersonic scramjets, rocket motors, sensors, and advanced manufacturing materials.<sup>152</sup> At AUSMIN 2024, Australian and US officials welcomed progress on the buildout of a hypersonic weapon under the SCIFiRE program and communicated their support for the testing of Hypersonic Attack Cruise Missiles by the US and Australian Air Forces,<sup>153</sup> in anticipation of fielding the capability aboard the Royal Australian Air Force's F/A-18F fleet.<sup>154</sup>

## b. Japan

Though somewhat slow to start compared with other key alliances and partnerships, US-Japan cooperation on defence industrial and technology initiatives has gradually intensified over the last four years.

### **Maintenance, repair and overhaul (MRO)**

Enhancing MRO capabilities for US assets forward deployed to Japan has become a major alliance initiative since early 2023. This push was spearheaded by Washington's then-ambassador, Rahm Emmanuel, who repeatedly pitched Japanese private shipyards already conducting fleet maintenance for Japanese warships as essential means for improving the overall readiness of US forces in the Indo-Pacific and, to a lesser extent, as a source of additional shipbuilding capacity for the US Navy.<sup>155</sup> Emmanuel framed such cooperation as essential both for shortening up deterrence in peacetime and for offsetting contested logistics challenges in prospective future crisis scenarios, citing the extensive repair backlogs afflicting US surface and subsurface fleets alike.<sup>156</sup> Indeed, while US Military Sealift Command vessels have occasionally been repaired at Japanese shipyards, historically, US warships deployed to Japan have only been able to access basic maintenance capabilities at established US bases in Yokosuka and Sasebo, and have had to return to the US mainland for deeper maintenance and overhaul.

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## US officials have also suggested that Washington will encourage Japan to extend access to its shipyards for MRO purposes to “friendly third countries such as the U.K. and Australia” once bilateral initiatives have proven effective.

There have already been notable signs of progress. Most notably, the US-Japan April 2024 Leaders’ Summit formalised the alliance’s new focus on MRO. Firstly, it marked the establishment of the Forum on Defense Industrial Cooperation, Acquisition and Sustainment (DICAS) — jointly administered by the Office of the US Undersecretary of Defense for Acquisition and Sustainment and Japan’s Acquisition, Technology, and Logistics Agency — which included dedicated task groups focussed on MRO and co-sustainment opportunities for forward-deployed US Navy ships and US Air Force fourth-generation aircraft at Japanese commercial facilities. These discussions have already produced an initial agreement reached in May to allow Japanese companies to service US F-15 and F-16 aircraft in Japan beginning in 2025 (on top of F-35 and F-18 aircraft already eligible), removing requirements for the aircraft to be flown to South Korea for routine maintenance.<sup>157</sup> The administration also signalled its intent to work with Congress to smooth the legal and regulatory architecture for greater naval MRO in Japan, seeking the necessary authorisations for Japanese shipyards to conduct maintenance and repairs of 90 days or less on US Navy ships homeported in US homeland facilities deployed to the region, and to “review opportunities to conduct maintenance and repair of forward-deployed U.S. Navy ships at Japanese commercial shipyards.”<sup>158</sup> This built on additional groundwork laid earlier in 2024, including the establishment of the Ship Repair Council Japan

in January 2024 between the US Navy, JMSDF and industrial partners from both countries to identify opportunities for naval MRO work at Japanese commercial shipyards.<sup>159</sup>

Importantly, both Tokyo and Washington have shown an interest in potentially multilateralising MRO collaboration with third parties. In March 2024, a US delegation featuring senior Pentagon, Joint Staff and Defense Logistics Agency officials visited Japan as part of a wider regional tour to identify opportunities for “establishing a network of regionally aligned maintenance, repair, and overhaul capabilities,”<sup>160</sup> while US Secretary of the Navy Carlos Del Toro visited several Japanese shipyards for discussions on “attracting Japanese investment in integrated commercial and naval shipbuilding facilities in the United States.”<sup>161</sup> Indeed, US officials have also suggested that Washington will encourage Japan to extend access to its shipyards for MRO purposes to “friendly third countries such as the U.K. and Australia” once bilateral initiatives have proven effective.<sup>162</sup>

### Co-production and supply chains

Concurrently, Tokyo and Washington have sought to deepen cooperation on critical defence supply chains, particularly air defence munitions. This included establishing new agreements and forums for facilitating cooperation, as well as seeking to remove barriers to exports and transfers of defence capabilities and technologies between the two countries. For example, in December 2023 Japan made the first major revisions to its Three Principles on Transfer of Defense Equipment and Technology since 2014 in order to facilitate the reexport of defence items produced in Japan under foreign license back to their place of origin, with the initial objective of increasing exports of Patriot PAC-2 and PAC-3 interceptors to the United States.<sup>163</sup> Though this decision was framed by the Pentagon as intended “to replenish U.S. inventories,”<sup>164</sup> it also came in the context of Washington’s efforts to ramp up the supply of air defence capabilities and munitions to Israel and Ukraine, and on the back of discussions between President Biden and Prime Minister Kishida Fumio in August 2023,<sup>165</sup> demonstrating a role for regional allies in materially supporting US global security objectives without necessarily deploying forces. Additionally, Japan and the United States entered into a Security of Supply Arrangement



(SoSA) in late 2023, creating a mechanism for both sides to “request expedited handling of industrial resources” to meet national and mutual “national security needs.”<sup>166</sup>

On the back of those developments, Tokyo and Washington have sought to engage further on defence supply chain and production cooperation opportunities through DICAS. Indeed, one of four working groups within this arrangement is explicitly tasked with identifying pathways and opportunities for the “co-development and co-production of missiles,”<sup>167</sup> with the AIM-120 air-to-air missile and PAC-3 missile interceptor identified as pilot projects in late 2024.<sup>168</sup> Indeed, then-Ambassador Emmanuel framed DICAS explicitly in the context of shrinking US industrial capacity and global demand pressures for munitions of all types in Europe and the Middle East,<sup>169</sup> placing a clear premium on the rapid development of extra production capacity and output — and the extent to which long-standing barriers including technology transfer restrictions could be reformed — as the measure of DICAS’s success.<sup>170</sup>

## Defence technologies

Defence technology development occupied a prime position in US-Japan defence industrial and technology cooperation under the Biden administration. Beyond the new trilateral defence technology cooperation initiatives with Australia discussed above, Japan and the United States have also sought to advance new bilateral defence technology co-development projects of their own. This involved updating or establishing the primary legal mechanisms used for such cooperation. At the first US-Japan Security Consultative Committee (or “2+2”) of the Biden team’s first term in May 2021, Tokyo and Washington finalised an Exchange of Notes on enhanced security measures for classified military information related to Advanced Weapon System, as well as an Exchange of Notes on Cooperative Research, Development, Production and Sustainment as well as Cooperation in Testing and Evaluation,<sup>171</sup> a precursor to the January 2023 Memorandum of Understanding for Research, Development, Test and Evaluation Projects (RDT&E),<sup>172</sup> marking a significant upgrade in the alliances defence technology cooperation architecture.

These developments helped to advance tangible cooperation on discrete defence technology initiatives. From May 2021, Tokyo and Washington

steadily established a new initiative to develop counter-hypersonic weapons capabilities, culminating in the finalisation of a formal Glide Phase Interceptor (GPI) Cooperative Development research and development agreement in May 2024.<sup>173</sup> This arrangement was framed explicitly in the context of long-standing US-Japan collaboration on air and missile defence projects,<sup>174</sup> most notably the co-development and production of the Standard Missile-3 Block IIA beginning in 1999,<sup>175</sup> and Japan’s purchase of Aegis Ballistic Missile Defence systems for the Japan Maritime Self-Defense Force and Aegis Ashore variant in 2017 (though scrapped by Tokyo in 2020).<sup>176</sup> Importantly, these developments also came about after Japan made explicit requests to the office of the US undersecretary of defence for research and engineering in October 2021 for greater defence acquisition and technology collaboration, including on hypersonic capabilities, in the interests of upgrading the overall alliance relationship.<sup>177</sup>

## c. India

The Biden administration also made notable strides in advancing a range of defence industrial and technology initiatives with India, with the goal of “strengthening India’s capabilities, enhancing its indigenous defense production, facilitating technology-sharing, and promoting supply chain resilience.”<sup>178</sup> It sought to do so by leveraging both existing mechanisms like the Defence Trade and Technology Initiative (DTTI), as well as through new initiatives like the India-US Defense Acceleration Ecosystem (INDUS-X) and the Defense Innovation and Technology Cooperation branch of the January 2023 Critical and Emerging Technology (iCET) initiative.<sup>179</sup> These efforts have been cohered within the June 2023 US-India Defence Industrial Roadmap, intended as interim guidance pending updates to the *2015 Framework for the US-India Defense Relationship*.<sup>180</sup>

### Maintenance, repair and overhaul (MRO)

Interestingly, US-India cooperation on MRO has outstripped equivalent lines of effort in America’s treaty alliances with Australia, Japan and South Korea. This has been particularly noteworthy with respect to naval MRO, a priority in US efforts to “to make India a [military] logistic hub for the United States and other partners in the Indo-Pacific region.”<sup>181</sup> An

initial principals' agreement in April 2022 to explore utilising the Indian shipyards for mid-voyage repair and maintenance of US Maritime Sealift Command (MSC) vessels was quickly operationalised in August 2022, when the dry cargo ship USS *Charles Drew* docked at Larsen & Toubro's (L&T) Shipyard in to fulfill a one-off ship repair and maintenance contract,<sup>182</sup> followed up with repairs to the USNS *Matthew Perry* in March 2023.<sup>183</sup> These arrangements were cemented over the next year with the signing of the three five-year Master Ship Repair Agreements (MSRA) between the US Navy and L&T, Mazgaon Dock Shipbuilders, and Cochin Shipyard Limited, respectively, between July 2023 and April 2024,<sup>184</sup> with fourth and fifth shipyards at Kolkata Port and Goa Shipyard Ltd reportedly under consideration for similar agreements.<sup>185</sup>

Efforts to expand India's MRO capacity have also extended to naval aviation, capitalising on a long-standing vector for enhancing US-India — and, for that matter, India-Australia and India-Japan — military interoperability through sales of manned and unmanned systems.<sup>186</sup> For example, Indian company Air Works and US company Boeing established the Boeing India Repair Development and Sustainment (BIRDS) hub in February 2021 to greatly enhance India's capacity to conduct depot level inspections, including heavy maintenance and service checks, on Boeing-made P-8I *Poseidon* maritime patrol aircraft operated by the Indian Navy and the VIP transport fleet operated by the Indian Air Force,<sup>187</sup> services which Air Works hopes to extend to the Australian and New Zealand defence forces in coming years.<sup>188</sup> Similar industrial partnerships have been built-out to support India's acquisition of 31 MQ-9B unmanned aerial systems from the United States.<sup>189</sup> In February 2023, Indian state-run enterprise Hindustan Aeronautics Ltd was certified to provide MRO services for engines of American MQ-9B aircraft,<sup>190</sup> while the development of local MRO support in India was included in the final contract between India and General Atomics announced in October 2024.<sup>191</sup>

### **Co-production and supply chains**

Greater collaboration on MRO synergised with parallel efforts to enhance co-production for US-origin systems and components in India, including in aviation and munitions, after a decade of piecemeal progress under the 2012 DTTL.<sup>192</sup> Progress here has

been enabled through a combination of enhanced technology sharing and localised production agreements. For example, the United States and India negotiated notable increases to the percentage of Indian-made electronics, sensors, avionics and other componentry that would be included in its future MQ-9B fleet.<sup>193</sup> The Indian Government also reportedly sought agreement that 21 of its 31 platforms would be assembled at Indian facilities along with attendant technology transfer authorisations, in the interests of establishing a Sea Guardian Global Sustainment (SGSS) Hub in India to provide MRO support for MQ-9 drones operated by friendly powers in the Indo-Pacific.<sup>194</sup> In addition, an agreement struck between American company General Electric (GE) and India's Hindustan Aeronautics Limited (HAL) will see the former transfer 80% of technologies involved in the production of F414 engines transferred to the latter, a marked increase from 58% transfer rate proposed as part of a previous Engine Development Agreement in 2012, to support the development of India's Light Combat Aircraft (LCA)-MK2.<sup>195</sup> Aside from facilitating more efficient MRO, the deal is also expected to pave the way for transfers of other jet engine technologies and manufacturing capacity to India.

Washington has also increasingly turned to India for cooperation on munitions production and supply chain security. As part of a wider effort to offset shortfalls in US explosives, energetics, primer and fuse production by tapping global partners, the US Army awarded multi-year contracts to Indian companies for the production of 155mm shell componentry in October 2023.<sup>196</sup> In June 2024, the National Security Advisors of both countries also flagged a new strategic semiconductor partnership between General Atomics and 3rdiTech to “co-develop semiconductor design and manufacturing for precision-guided ammunition and other national security-focused electronics platforms.”<sup>197</sup> This would seemingly support ongoing negotiations over the production of Javelin anti-tank missiles in India to support its own requirements,<sup>198</sup> a discussion which has waxed and waned for over a decade due to US restrictions of technology sharing and, as a result, India's decision to purchase equivalent systems from other suppliers with more favourable technology transfer provisions.<sup>199</sup> Importantly, these discussions are occurring at the same time as India has drastically reduced its imports of many types of ammunition from overseas,<sup>200</sup> most notably from Russia.<sup>201</sup>

## Defence technologies

Washington has also sought to advance defence technology co-development initiatives with India, focused on discrete capability development projects and creating a more permissive and connected ecosystem between US and Indian defence technology innovators. For example, after over a decade of stalled efforts to identify and commence joint projects, in July 2021 the Pentagon and India's Ministry of Defence announced the inaugural project agreement for air-launched unmanned systems through the DTTI,<sup>202</sup> including arrangements to facilitate joint intellectual property ownership and sales to third parties.<sup>203</sup> This was followed by the identification of a further two DTTI projects focused on counter drone systems and intelligence, surveillance and reconnaissance (ISR) platforms in February 2023.<sup>204</sup> Concurrently, through the Defense Innovation and Technology Cooperation branch of the iCET initiative announced by Biden and Narendra Modi in January 2023, the two countries pursued additional bespoke co-development and co-production projects focussed on driving near-term collaboration on "jet engines, munition related technologies, and other systems" and longer-term cooperation on capabilities with "maritime security and [ISR] operational use cases."<sup>205</sup> The two sides also sought to better connect their defence business communities, establishing the INDUS-X mechanism to better connect US and Indian defence start-ups,<sup>206</sup> with initial collaborations focussed on autonomy and ISR in the air and maritime domains announced in February 2024.<sup>207</sup> Both countries have pursued these efforts in the wider context of deepening their collective capacity for "precision warfare" in the maritime environment, chiefly "through the integration of modern sensors, munitions, and artificial intelligence."<sup>208</sup>

## d. Republic of Korea

Defence industrial and technology collaboration only really assumed prominence in the US-Korea alliance with the advent of the Yoon Suk-yeol administration in Seoul in May 2022, having featured only sparingly in joint communications until that time.<sup>209</sup> In recent years, however, these issues have been identified as central to enhancing "interoperability and interchangeability within the Alliance

defence architecture,"<sup>210</sup> with the November 2023 Defense Vision of the US-ROK Alliance underscoring optimised defence industrial cooperation and enhanced supply chain resiliency as top priorities going forward.<sup>211</sup>

## Maintenance, repair and overhaul (MRO)

Korea and the United States have identified MRO collaboration as a priority for "enhancing the Alliance's posture and capabilities," including in the context of developing distributed readiness capabilities in a contested logistics environment.<sup>212</sup> Notably, this has included a shift in arms sales practices to include industrial upskilling provisions in recent FMS sales of US capabilities to South Korea, with the intention of facilitating greater in-country MRO of US-origin capabilities operated by both countries' forces. For example, as part of a December 2023 deal to purchase 20 F-35 fighter aircraft, the ROK Air Force announced in April 2024 that it would establish a heavy maintenance and repair depot at Cheongju Airbase by 2027, removing requirements for ROKAF F-35 aircraft to be flown to Australia for deep maintenance.<sup>213</sup>

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Defence industrial and technology collaboration only really assumed prominence in the US-Korea alliance with the advent of the Yoon Suk-yeol administration in Seoul in May 2022, having featured only sparingly in joint communications until that time.

More notably, the last four years witnessed a growing mutual interest in each country's shipbuilding and shipyard capabilities. Indeed, senior US Navy officials made several visits to South Korea for meetings with the ROK defence acquisition officials and private shipyard operators to assess local capabilities and best practices.<sup>214</sup> However, notwithstanding Korea's inclusion in the US Regional Sustainment Framework (RSF) concept, most of these engagements focussed on prospective South Korean investments in MRO and shipbuilding in US mainland facilities, rather than on utilising in-country MRO capabilities in South Korea. Navy Secretary Carlos Del Toro was particularly vocal on the subject, positing investments in US shipbuilding and adjacent maritime industries by close and capable allies like South Korea and Japan as essential to what he has called a "new maritime statecraft... to build comprehensive U.S. and allied maritime power."<sup>215</sup>

Beyond commercial shipping, this included spotlighting Korean and Japanese capacity to produce "world class" high-end naval vessels like air warfare destroyers at the fraction of the cost of US equivalents.<sup>216</sup> This shift towards greater collaboration on military shipping has been reflected in recent commercial activity between the two countries. For instance, HD Hyundai Heavy Industries (HD HHI) and Hanwha Ocean, two of Korea's biggest shipbuilders, both applied for Master Ship Repair Agreements (MSRA) and explored targeted partnerships with local US firms for MRO and design work for a range of merchant and military shipping.<sup>217</sup> This ultimately resulted in South Korean defence giant Hanwha securing a controlling stake in Philly Shipyard, a move framed by the company's CEO as an investment in "the national revitalization of U.S. shipyards" and as a pitch for future US Navy shipbuilding contracts.<sup>218</sup>



A South Korean engineer works on a K-9 self-propelled howitzer at Hanwha Aerospace factory in Changwon, September 2023. Source: Getty

## Co-production and defence supply chains

Perhaps the most high-profile manifestation of closer US-South Korea defence industrial collaboration has been Seoul's emergence as a major source of artillery ammunition to support US partners in other regions, particularly in Europe. In November 2022, following the certification of compatibility between US and South Korean artillery munitions and platforms,<sup>219</sup> reports first emerged that the United States would purchase around 100,000 155mm artillery shells from South Korean manufacturers to backfill its own stockpiles,<sup>220</sup> followed by further reporting that Washington was being forced to draw on ammunition stockpiles in Israel, Korea and Kuwait to meet Ukrainian demands. In April 2023, South Korea announced that it was willing to "loan" 500,000 155mm shells to Washington with the understanding that this ammunition would be used to backfill US reserves rather than supplying Ukrainian forces and that these weapons would be replaced through US orders with South Korean companies.<sup>221</sup> This amounted to South Korea indirectly supplying Ukraine with more artillery ammunition than the entirety of European contributions combined within the first two years of the war.<sup>222</sup> Though perhaps more an example of the benefits of interoperability and of South Korea's growing stature as a defence industrial powerhouse in its own right than of any significant integration success story,<sup>223</sup> these developments are nonetheless illustrative of the benefits of a federated approach to defence industrial supply chains that leverage allies' niche advantages and latent capacity to service US or collective security requirements.

To that end, Seoul and Washington have also pursued several agreements to enhance defence industrial capacity sharing. For instance, the two countries signed a SoSA in November 2023, intended to allow both sides "to acquire the industrial resources they need to quickly meet defense requirements" and strengthen supply chain resiliency,<sup>224</sup> and are presently examining a Reciprocal Defence Procurement Agreement intended to improve "reciprocal market access" and "enhance supply chain resiliency."<sup>225</sup> Korean companies have also sought to establish major footholds in the US defence market,<sup>226</sup> including by forming consortiums with local US businesses to bid for US Army contracts for howitzers, unmanned vehicles, and other capabilities,<sup>227</sup>

and partnering with other foreign firms to modernise key US defence industrial outputs including in ammunition and shipbuilding.<sup>228</sup>

## Defence technologies

Washington and Seoul have also recognised "the need to modernize the Alliance and expeditiously deliver game-changing technologies to the warfighter" through greater cooperation, including joint development projects.<sup>229</sup> However, unlike Washington's other major defence technology partnerships with Australia, Japan and India, those areas identified for US-Korea collaboration appear to be primarily dual-use in nature, meaning that they are defence-adjacent rather than defence-explicit. In June 2022, US Deputy Undersecretary of Defense for Research and Engineering David Honey identified artificial intelligence, quantum computing, communications, biotechnologies, and renewable energy generation and storage as top five priorities for bilateral technology cooperation with spillover implications for defence cooperation.<sup>230</sup> Similarly, the US-ROK Next Generation Critical and Emerging Technologies Dialogue launched in December 2023 focuses on strategically important technology categories intended to enhance supply chain resilience and secure competitive advantages in defence-adjacent rather than defence-explicit categories like semiconductors, quantum and artificial intelligence.<sup>231</sup>

However important, these developments have not yet been matched by public announcements regarding specific defence capability or technology development projects. Granted, the two sides have recently proposed the creation of a bilateral senior-level committee to enable greater defence science and technology cooperation, as well as establishing a joint defense science and technology conference in the future.<sup>232</sup> Yet, despite the existence of major research and development agreements between major South Korean defence companies and US military services,<sup>233</sup> comments from senior officials on both sides have suggested that the two countries presently remain focused on technology-sharing rather than co-development.<sup>234</sup> This may have as much to do with commercial competitiveness as with technological capacity. Indeed, while previous bilateral co-development projects have been halted mid-phase due to technology gaps between South Korea and the United States, US sensitivities over intellectual property loss or theft through sharing

advanced defence technologies with South Korean firms have also hamstrung collaboration,<sup>235</sup> restrictions which have impeded (though not prevented) Seoul's development of its own indigenous versions of certain capabilities.<sup>236</sup>

## e. Taiwan

Though DIB integration remains comparatively shallow against other US alliances and partnerships in Asia, the Biden administration nevertheless presided over a maturing US-Taiwan relationship, establishing new channels for defence industrial and innovation cooperation to enhance Taiwanese security and diversify US supply chains for drone components.<sup>237</sup> What's more, the operational requirements for defending Taiwan have greatly informed a range of new defence industrial and technology initiatives across the US DIB ecosystem. This includes the Pentagon's Replicator initiative, announced in August 2023, which aims to produce "all domain attributable autonomous systems (ADA2) to war fighters at a scale of multiple thousands ... within 18-24 months, or by August 2025,"<sup>238</sup> with recent expert commentary noting explicitly noting the degree to which Replicator sought to adopt operational lessons from Ukraine to the Indo-Pacific theatre to provide asymmetric defensive options against peer conventional adversaries.<sup>239</sup>

### Co-production and defence supply chains

The Biden administration demonstrated a particular willingness to engage Taiwan on shoring up defence supply chains for drones and their components. For the United States, this is as much about heeding lessons from Ukraine vis-à-vis the utility of low-cost, attritable drones as it is about diversifying US domestic drone supply chains away from China.<sup>240</sup> Following the Taiwanese Government's announcement of formal plans to manufacture thousands of drones by mid-2024, a US trade delegation of officials and senior defence industry representatives travelled to Taiwan to discuss how the country could become a more substantial contributor to allied and partner UAS supply chains.<sup>241</sup> Shortly thereafter, Taiwan's Ministry of Defense signed a formal agreement with the United States to purchase nearly 1,000 attack drones, with the US State Department

approving the sale of 291 Altius 600M-V aerial systems and 720 Switchblade 300 loitering munitions, with a total value of US\$360 million.<sup>242</sup> As has been noted by former US officials, including Rear Admiral Mark Montgomery (ret), these developments indicate fairly swift action on the part of the Biden administration to transfer lessons from Ukraine into updated procurement plans.<sup>243</sup>

### Defence technologies

In late 2024, Taiwanese officials revealed the government had established a direct counterpart to the US Defense Innovation Unit, to develop innovative technologies, including UAS and C-UAS, as well as military applications of AI.<sup>244</sup> Interestingly, Taiwan's Defense Minister, Wellington Koo, noted the group has already begin coordinating with the US DIU on UAS and C-UAS systems.<sup>245</sup> These developments were reflected in FY2025 NDAA language, with the House version requiring a "feasibility assessment of establishing a strategic partnership between the Defense Innovation Unit and the Taiwanese Ministry of National Defense."<sup>246</sup> These developments represent a meaningful increase in the depth of the US-Taiwan relationship, with a notable shift towards supply chain activities and steps toward the co-development of novel technologies.

## f. Multilateral initiatives

Finally, the Biden administration took steps towards multilateralising elements of these various defence industrial cooperation agendas through the creation of two related mechanisms, the Regional Sustainment Framework and Partnership for Indo-Pacific Industrial Resilience. Though new initiatives in their own right, both appear to be aimed at cohering disparate lines of effort within different US alliances and partnerships behind a more unified approach to common capacity and operational challenges described in this report. Indeed, both have been informed by the "global experience of the Ukraine conflict" and the new premium placed on deepening "multilateral collaboration on regional industrial base and manufacturing production challenges" in anticipation of — rather than simply in response to — "emergency circumstances."<sup>247</sup>

## Regional sustainment framework (RSF)

Firstly, the Department of Defense launched the RSF in May 2024. The RSF is broadly intended to optimise US maintenance, repair and overhaul (MRO) capabilities in the service of underwriting a more credible deterrence posture with three broad objectives: strengthening key regional defence industrial partnerships; distributing US sustainment posture to address contested logistics challenges; and improving overall US and allied military readiness in peacetime and wartime alike by reducing transit times and backlogs for routine and deep maintenance.<sup>248</sup> In keeping with the 2022 NDS, the Indo-Pacific was identified as the initial pathfinder for the RSF concept based on the sheer maritime logistical and “readiness regeneration” challenges facing INDOPACOM, coupled with an assessment that regional allies were among the most willing and able to support its early realisation.<sup>249</sup>

Rather than a one-size-fits-all template, RSF initiatives in different combatant commands will be tailored to discrete regional operational requirements and the relative advantages offered by participating nations.<sup>250</sup> In the case of the Indo-Pacific, the RSF will reportedly focus on maximising regional resources already available to Washington, with a natural focus on major allies and partners — Japan, South Korea, Australia, Singapore, the Philippines, and others — already operating common defence platforms, supporting or hosting US forces, pursuing MRO collaboration with the United States, and/or those with the greatest “potential for collaborative development, production, and sustainment endeavors.”<sup>251</sup> For instance, Australian and American principals have framed the former’s growing in-country MRO capabilities for US-origin maritime aircraft and plans to expand those activities to tactical data communications equipment in the near future both in the context of the RSF,<sup>252</sup> while the US Air Force has already conducted engagements with Australian and Filipino counterparts through its Global Enterprise Network for Universal Sustainment (GENUS) program, pitched as the service’s primary contribution to the Indo-Pacific RSF.<sup>253</sup>

## Partnership for Indo-Pacific Industrial Resilience (PIPIR)

Secondly, in August 2024 the Pentagon previewed the establishment of the PIPIR. This initiative was intended to address issues similar to the RSF concept, but with an additional focus on co-development and acquisition issues to go with sustainment challenges.<sup>254</sup> According to then-Undersecretary of Defense for Acquisition and Sustainment Bill LaPlante, the intention behind PIPIR was to similarly “set up a regular cadence” of discussions on shared regional maintenance and production challenges and requirements tailored to the geographical and geopolitical context of the Indo-Pacific,<sup>255</sup> including addressing identifying and removing barriers to cooperation, exchanging information on potential international collaborations, and sharing best practices.<sup>256</sup> Analysts have compared PIPIR to the national armaments directors’ subgrouping in the Ukraine Defense Contact Group, a collection of nearly 50 countries that has marshalled discussions on rightsizing and synchronising the production and provision of lethal aid to the Ukrainian military since April 2022.<sup>257</sup>

The contours of PIPIR have emerged steadily over the course of the last year, though its specific activities remain difficult to discern. The August 2024 announcement built on several initial engagements between the United States and its regional partners in Hawaii and Singapore throughout 2024,<sup>258</sup> producing a “Statement of Principles for Indo-Pacific Defense Industrial Base Collaboration” on the sidelines of the May 2024 Shangri La Dialogue endorsed by the United States and 12 other participating nations. This document included an emphasis on exploring “collaborative action” on capacity, workforce, supply chain, innovation, information-sharing, and standardisation challenges.<sup>259</sup> October 2024 saw the Inaugural PIPIR Plenary Meeting convened in Hawaii between senior officials at the undersecretary and national armaments directors’ levels, resulting in an as yet unpublished Core Vision Statement and the identification of four ongoing workstreams: sustainment, production, supply chain resilience, and policy and optimisation.<sup>260</sup> Much like the RSF, initial work has seemingly focussed on cohering various preexisting projects in different bilateral alliances. Though short of specific detail, “progress” under PIPIR was flagged in joint defence and foreign affairs principals’ statements with Australia and the Republic of Korea in mid-2024.<sup>261</sup>

# 3. Obstacles to defence industrial and technology integration

Notwithstanding progress in each of the alliances and partnerships explored above, a combination of functional, political and regulatory obstacles remains to maximising the benefits of Washington's growing defence industrial and technology integration agenda with Australia, India, Japan and South Korea. To be sure, these problems are not exclusively American in origin, and will require a degree of allied and partner buy-in to break down their own domestic cultural, legal, political and procedural barriers to greater defence industrial and technology integration. Even so, many of these challenges are long-standing, with reform efforts progressing only incrementally despite a rapidly changing regional and global strategic context. Needless to say, reassessing these problem sets and readjusting efforts to address them should be a primary concern for the new Trump administration should it choose to stay the course on greater industrial and technology integration with regional allies and partners.

## a. Defence export controls and technology sharing

Firstly, defence export controls continue to hamper defence industrial capacity-sharing and technology development with America's major defence partners in Asia. Chief among these regimes is the International Traffic in Arms Regulations (ITAR), a system of defence trade controls designed to strictly regulate the dissemination of military articles and services "in and for an era of US technology and strategic dominance" which many US experts and officials alike have come to see as unfit for America's strategic circumstances and which many administrations before the Biden team had tried and failed to reform.<sup>262</sup> Though some progress has been made in refashioning these regulations for contemporary strategic needs, much work remains to be done to ensure that Washington's ambitious alliance modernisation efforts do not fall afoul of the same challenges that have hamstrung such initiatives in the past.

Indeed, export control-related challenges remain a considerable obstacle even in the case of AUKUS. While these aforementioned reforms have reduced some compliance costs and improved "everyday defence industrial and technology cooperation" between Australia and the US, they continue to

pose major challenges for more advanced defence technology initiatives, particularly for advanced capability collaboration through AUKUS Pillar II.<sup>263</sup> This is due largely to the increased compliance costs that private sector entities, especially small and medium-sized enterprises, will have to shoulder in maintaining "authorised user status" with respect to these exemptions, the complicated interplay between US and Australian jurisdictions, and the Excluded Technologies List (ETL) which captures many more advanced technologies central to most imaginable forms of collaboration through Pillar I and Pillar II.<sup>264</sup> The latter is made particularly complex because of the Cold War-era non-proliferation agreement, the Missile Technology Control Regime (MTCR).<sup>265</sup> Though in January 2025 the Biden administration announced changes to how the US would interpret its obligations and latitude under that arrangement,<sup>266</sup> recent signals from Australian officials suggest that work remains to minimise the drag that the MTCR is having on AUKUS-related cooperation.<sup>267</sup>

Senior US defence officials have observed, much as it has with AUKUS, that Washington will need to be similarly willing to shoulder greater risk in technology sharing for alliance modernisation efforts to bear fruit with India, Japan, and other key partners.<sup>268</sup> Yet US policymakers have continued to harbour reservations about loosening controls for these allies for a variety of technical, political and commercial reasons, even when these restrictions are actively hampering alliance modernisation initiatives. The reasons for this reluctance are varied. For Japan, prior experiences in complying with US defence trade controls, particularly in the context of federated capability projects like the F-35 joint strike fighter, were a major reason behind its decision to collaborate with Italy and the United Kingdom on a sixth-generation stealth fighter jet.<sup>269</sup> Yet export control issues cannot be disaggregated from wider concerns about Japan's cybersecurity, security clearance and information protection measures, all of which require further tightening beyond recent reform efforts.<sup>270</sup> Leading South Korean experts have also cited US export controls as a primary impediment to closer defence industrial collaboration, using language similar to that used in the AUKUS context to advocate for "tailored" bilateral agreements to allow more "flexible" and "secure" technology transfers.<sup>271</sup> Yet experts have also identified as the growing commercial competitiveness of South





Deputy Prime Minister and Minister for Defence, the Honourable Richard Marles MP, with US Secretary of Defense, Pete Hegseth, at Arlington National Cemetery, Washington DC, February 2025. Source: Australian Department of Defence

Korean defence industry relative to US companies, and historical concerns over technology theft of US military information by South Korean firms, as key impediments to export control reform for Korea and a major reason why US-ROK defence industry and technology cooperation has “lagged significantly behind other US allies.”<sup>272</sup>

With India, these dynamics are particularly complicated given its place outside of the formal US alliance system. On the one hand, the ITAR has long complicated US efforts to build greater military interoperability through arms sales or more regular patterns of technology cooperation, including co-development projects.<sup>273</sup> These barriers persist not for lack of attention. Indeed, Washington has undertaken long-term efforts to expand the number of permissible defence and dual-use technology transfers from the US to India over the last 20 years (including through the DTTI),<sup>274</sup> and all-round efforts to uplift defence trade control literacy within Indian industrial and innovation communities.<sup>275</sup> Even so, commentators have worried that these same challenges would similarly derail the various supply chain and co-production initiatives outlined above,<sup>276</sup> particularly with respect to private sector collaboration through iCET or INDUS-X.<sup>277</sup>

Unlike with Australia, Japan, or South Korea, defence trade control issues with India are further complicated by its alignment choices, particularly with Russia. Anecdotal evidence suggests that INDUS-X has had a very positive effect on speeding licensing approvals for select maritime and space cooperation initiatives,<sup>278</sup> yet stakeholders across the US system remain concerned about the security risks they see in greater defence technology-sharing with India given its close relationship with Russia and the ambitious technology transfer permissions sought by Delhi relative to its partnership status compared with close allies like Australia or Japan.<sup>279</sup> Indeed, though the Biden administration granted India sanctions waivers for the procurement and sustainment of select high-end Russian defence capabilities like the S-400 air and missile defence system,<sup>280</sup> these sensitivities have prevented advanced US aircraft from interfacing with India’s air defence sensors for fear of information and technology leakage to Russian engineers and intelligence agents.<sup>281</sup> India’s recent covert operations abroad have also posed problems for cooperation with Washington and other allies, including congressional obstruction of the sale of MQ-9B UAVs to India due to alleged assassination plots against American-Indians<sup>282</sup> and alleged

industrial espionage attempts against Australia in April 2024.<sup>283</sup>

More broadly, the United States and its allies must now contend with the prospect of navigating a multi-tiered defence trade control system in minilateral settings. This is due to the creation of a partial exemption for Australia from most US military and dual-use trade controls to facilitate AUKUS, but in a context where Canberra and Washington are both seeking greater trilateral or broader defence technology collaboration. Efforts to create an AUKUS ‘platinum standard’, however necessary and well-intentioned, could potentially complicate collaboration between America, Australia and other regional partners. To be sure, creating a tiered export control system that discriminates between different ‘classes’ of countries (i.e. allies, partners, neutrals and adversaries), as the AUKUS defence trade control reforms are intended to do, is welcome, if not overdue.<sup>284</sup> Yet given that, of the countries considered in this report, only Australia would stand to benefit from reforms to US export controls (and would risk emulating the more problematic aspects of the ITAR), Washington may quickly find that its present two-tiered approach — countries partially exempt versus those not exempt at all — may inadvertently complicate defence industrial and technology cooperation with other partners, particularly in other minilateral settings like the Australia-Japan-US Trilateral Strategic Dialogue or any prospective ‘AUKUS Plus’ arrangement, however distant, featuring Japan or South Korea.<sup>285</sup>

## b. Defence acquisition: Accessing and leveraging commercial technologies

Many of America’s defence technology initiatives with Indo-Pacific allies and partners increasingly hinge on a collective capacity to access commercial and dual-use technologies for defence means. Leading experts have noted repeatedly that the locus of innovation resides in the commercial sector, frequently outstripping technological developments funded by government R&D.<sup>286</sup> Likewise, senior US officials leading the Pentagon’s work on defence innovation note on multiple occasions that the commercial technology sector is leading progress in 11 out of 14 of the US DoD’s critical technology areas of

focus, a dynamic that is broadly comparable across other allies and partners.<sup>287</sup> The challenge of integrating these technologies into the national security innovation base of any given country is relatively new, with defence procurement having largely pivoted on the acquisition of complex, exquisite platforms from ‘pure-play’ defence primes rather than commercially developed technologies in AI, quantum computing and automation from small and medium-sized businesses.<sup>288</sup> These technologies promise to transform the future of warfare, yet companies or universities producing them do not have great depth of experience engaging with the idiosyncrasies of government markets and are deterred by what they view as restrictive regulatory requirements and defence bureaucracies that operate at a glacial pace compared to the private sector.<sup>289</sup>

To be sure, not all US partnerships in Asia have matured to the point of needing to unpack these defence innovation issues collaboratively. However, progress on the co-development of defence technologies between the United States and Australia and the United States and India has arguably been thwarted because of these challenges. Recent research on the US-Australia context has shown how leveraging niche commercial technology advantages for defence through AUKUS and other mechanisms remains complicated by financing challenges, regulatory and cyber security requirements, weak economic incentives, complex and lengthy acquisition and procurement processes, and domestic manufacturing issues.<sup>290</sup> Many of these factors also exist in the US–Japan relationship, compounded by issues with Japan’s information-sharing, cyber security and security clearance standards compared with the United States.<sup>291</sup>

In broad terms, the three key issues here can be divided into three broad categories: market thesis, financing, and acquisition and procurement issues.<sup>292</sup> Firstly, for start-ups, small-to-medium enterprises (SMEs), research institutions and private capital funders across the commercial technology ecosystem, the market thesis for working in the defence sector is weak given the difficult pathways to scaling products, issues interpreting government demand signals, restrictive export controls (as detailed above), and small market sizes that often complicates building economies of scale.<sup>293</sup> Add to this challenges faced by commercial technology firms in actually identifying opportunities in the defence sector in the first instance and it is not dif-

difficult to see why the US Government faces difficulty leveraging commercial technologies for national security alone — let alone in coordination with Australia and India insofar as AUKUS Pillar II and INDUS-X are concerned.<sup>294</sup>

Financing defence innovation represents another barrier to defence industrial integration. Officials in the United States and Australia repeatedly stated private capital support for defence technology initiatives such as AUKUS Pillar II is essential absent adequate government fiscal resources.<sup>295</sup> Despite this, private capital markets across the United States and allied and partner countries face a range of disincentives to greater involvement in defence innovation. These include environmental-social-governance (ESG) barriers, a poor investment outlook, undesirable levels of capital expenditure to scale products, and prolonged defence budgeting cycles misaligned with venture capital fundraising rounds.<sup>296</sup> Encouragingly, Washington and its allies have attempted to bridge this gap in recent years. The Biden administration took an active approach to this issue in its engagement with India and Australia, establishing an “education series” under INDUS-X to mobilise private capital firms in both countries, while AUKUS officials have publicly endorsed innovation firm, BMNT’s AUKUS Pillar II Defence Investors Network.<sup>297</sup>

In America’s Northeast Asian alliances, efforts to collaboratively integrate private capital into allied defence industrial initiatives have been largely absent, despite particularly competitive innovation and technology ecosystems in both Japan and South Korea.<sup>298</sup> Though Japanese defence and aerospace startups received an uptick in US venture capital interest after Tokyo committed to defence budget increases in 2022, it seems that little has been done to establish formal public-private funding mechanisms for a growing portfolio of bilateral defence initiatives.<sup>299</sup> The Japanese Government’s limited engagement with its own defence innovation ecosystem also poses issues, with senior ATLA officials noting the dearth of financial support available to defence-relevant startups from defence-relevant agencies.<sup>300</sup> In the case of the US-ROK alliance, despite increasing private market interest in defence innovation — evidenced by the 2022 establishment of a US\$83.9 million defence industry investment fund by Seoul — bilateral defence technology has yet to explore defence financing issues.<sup>301</sup> This may be in part due to historical concerns about maintaining US industrial competitiveness, protection-

ism on both sides, and Washington’s anxieties about technology theft by Korean companies.<sup>302</sup>

Streamlining acquisition and procurement processes is the final — and perhaps most difficult — obstacle to defence industrial and technological integration. While the United States, its allies and partners face individual challenges aligning acquisition and procurement processes to commercial technology sector standards, those attempting co-development face an even more difficult challenge in harmonising their approaches.<sup>303</sup> In essence, lengthy government acquisition and procurement processes deter even initial engagement by nimble start-ups and commercial SMEs, who often do not possess the financial or human capital to lengthy periods without being awarded a government contract.<sup>304</sup> While defence innovation initiatives such as AUKUS Pillar II and INDUS-X are beginning to address these challenges, officials have described the ideal end state for AUKUS Pillar II capability acquisition as having one trilateral call for capability and one trilateral channel for technology adoption.<sup>305</sup> For this to become a reality, the United States, Australia and the UK will need to integrate their acquisition models, including through the harmonisation of risk assessments and consulting one another at the start of the process rather than as an afterthought.<sup>306</sup>

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The Extra Large autonomous underwater vehicle 'Manta Ray', developed by the US Defense Advanced Research Projects Agency (DARPA) and Northrop Grumman. Source: Northrop Grumman

### c. Information classification and foreign disclosure

Information-sharing and classification conventions pose a third major barrier to defence industrial and technology integration agenda. These long-standing challenges are exacerbated by frictions between traditional information protection practices, which emphasise risk minimisation (including sharing unclassified information) even with close allies and partners, and the strategic imperatives of greater integration with these same countries.<sup>307</sup> These issues can be divided into two broad categories: those associated with overclassification (particularly with respect to the application of Not Releasable for Foreign Nationals, or NOFORN), and those associated with collecting and sharing information in the interests of supply chain 'domain awareness'. In both instances, Washington and its allies must continue to reassess the risks of *not* sharing more infor-

mation and, by extension, of deepening their integration and targeted dependencies on one another. In the words of one senior US military official, failing to do so will be a "recipe for losing."<sup>308</sup>

#### **Overclassification and NOFORN**

Barriers posed to US-allied integration across the spectrum of defence cooperation by the overclassification of information endure today due not for a lack of awareness or effort. Since the early 2000s, Congress, the Pentagon and the White House issued multiple directives for US defence and intelligence officials to reduce the use of NOFORN classification with close allies like Australia.<sup>309</sup> Indeed, senior defence department and military service leaders in the first Trump administration, bemoaning the "unbelievably ridiculous" overclassification of information across the US defence ecosystem and the negative effects this had on foreign engagement, took steps to streamline information-sharing with trusted allies in specific operational areas.<sup>310</sup> This

included the mass reclassification of information from NOFORN to “Secret Releasable to Allies” as part of a broader refresh of security classification guidance for Space Command in 2017,<sup>311</sup> a notable step given the high sensitivity of information derived from space-based operations.

The Biden administration persisted with these efforts in its own cornerstone national security documents. The 2022 NDS identified intelligence and information-sharing as among several areas where key institutional barriers would need to be reduced in the interests of defence industrial integration, through measures including streamlined release procedures and expanded release authorisations “to facilitate information exchange for mutual benefit.”<sup>312</sup> Likewise, the 2022 Indo-Pacific Strategy committed to improving “transparency and information-sharing,” including with respect to defence industrial issues and supply chain networks.<sup>313</sup> Military service leaders also took these directives to heart. Senior US Navy figures identified a requirement to institute a “write for release” culture with respect to information and intelligence-sharing with allies, going as far as to frame improper NOFORN classifications as directly contradicting the directives of the 2022 NDS,<sup>314</sup> while the Air Force similarly sought to invert standing practices that encourage NOFORN by default, ‘Releasable to Allies’ by exception.<sup>315</sup>

While there have been encouraging signs of progress at the service level, information-sharing issues continue to compound defence industrial and technology collaboration with close allies, including multiple Indo-Pacific alliances and partnerships.<sup>316</sup> Indeed, outdated information sharing practices and procedures figure as among the largest obstacles to working with the US Department of Defense, often preventing capable allies from taking advantage of the very pathways intended to facilitate their participation in the US DIB.<sup>317</sup> The Pentagon’s Defense Innovation Board noted in its July 2024 report that despite considerable attention, foreign disclosure policies were undercutting fruitful defence industrial and technology relationships with top-tier allies,<sup>318</sup> recommending a wholesale review of Technology Security and Foreign Disclosure (TSFD) processes consistent with directives in the FY2024 NDAA.<sup>319</sup>

Perhaps unsurprisingly, information-sharing was central to many defence industrial and technology

agreements pursued by the Biden administration. Innovation challenges through bespoke initiatives like AUKUS and INDUS-X have encouraged greater information-sharing by facilitating stronger connections between different government and private sector entities, and providing inputs into supply chain mapping initiatives.<sup>320</sup> In the case of INDUS-X, government and industry leaders have sought to eliminate “regulatory friction” and overcome “information asymmetries” across the bilateral defence ecosystem by spotlighting business opportunities and “demystifying” acquisition procedures and requirements on both sides.<sup>321</sup> Within AUKUS, information-sharing figures as one of eight distinct workstreams under Pillar II, informing recent efforts to streamline co-development of advanced capabilities more broadly, such as electronic and undersea warfare,<sup>322</sup> as well as Australia’s development of a top-secret intelligence cloud built to US and UK specifications.<sup>323</sup>

Even so, reclassifying information for defence industrial integration purposes remains a work in progress. At a very broad level, these efforts must grapple with varying levels of information integration across different alliances and partnerships, particularly in formats larger than bilateral arrangements. Australia, for instance, is unique among the nations examined in this report for its membership of the Five Eyes, and for its existing level of integration into the US National Technology and Industrial Base. Conversely, defence industrial-related information-sharing with India, Japan and South Korea remains comparatively ad hoc, while the status of efforts to reform information-sharing practices and procedures across these different alliances and partnerships necessarily varies with the specific issues and political and strategic contexts in question in each of those countries. Though Washington possesses bilateral information and RDT&E agreements with all four partners, there are only two trilateral intelligence and information-sharing arrangements (Australia-Japan-US and Japan-South Korea-US) and a single trilateral RDT&E agreement (Australia-Japan-US) between them, with India absent from all three agreements.

Beyond that, information-sharing issues are intimately related to unreconciled differences between Washington and its allies on other industrial security issues, including export controls, security clearances, cybersecurity standards, and so forth. Even in the context of AUKUS, maximising the returns

on defence trade harmonisation and the enhanced information-sharing that is intended to flow from it will require further regulatory harmonisation and standardisation across the wider industrial security agenda.<sup>324</sup> Prospects for further industrial collaboration and technology sharing with Japan, which has promised “radical action to strengthen information security,”<sup>325</sup> have been linked with ongoing efforts to heighten Tokyo’s cybersecurity standards, institute security clearances for non-government entities, and implement classification measures for sensitive economic information.<sup>326</sup> India’s deep defence industrial relationship with Russia, meanwhile, continues to complicate the sharing of sensitive industrial information, with progress on some key projects stalled pending the separation of digital and physical infrastructure handling US-origin information from those handling Russian-origin information.<sup>327</sup>

To be sure, isolating and mitigating these risks is certainly achievable in these bilateral or even trilateral defence industrial and technology partnerships. Creating information ‘bubbles’ for specific projects with vetted government and non-government entities, establishing dedicated minilateral information-sharing and technology development agreements such as those between Australia, Japan and the United States, and/or creating information-sharing working groups of the sort associated with AUKUS all offer potential models for how progress might be achieved without compromising information security.<sup>328</sup> Yet, reforming classification and release systems for a broader range of US allies, especially in minilateral settings characterised by varying levels of technical integration and/or strategic alignment with US objectives, will not be an easy task.

## Supply chain visibility

Defence industrial collaboration has also been challenged by a lack of insight in Washington and allied capitals alike into their own respective and collective defence supply chain networks. This stems both from a reluctance to share sensitive information on supply chain vulnerabilities with and between government and industry partners as discussed above, but just as often from a lack of such information in the first place. As the Pentagon discovered in 2022, these issues are particularly acute for suppliers below the first tier (i.e. entities other than major companies). Following President Biden’s February 2021 Executive Order 14017 on America’s Supply Chains for the Department of Defense to assess the health of its critical defence industrial supply chains,<sup>329</sup> which built on President Trump’s July 2017 Executive Order 13806, the Pentagon subsequently concluded that it had very limited visibility over its second-, third- and fourth-tier suppliers.<sup>330</sup> Relatedly, subsequent research has spotlighted that the department has maintained significant dependencies on parts, materials and components manufactured in China, underscored by Beijing’s decision in December 2024 to cut off US access to three critical minerals central to defence production requirements.<sup>331</sup>

The department has since sought to rectify this through the creation of a Supply Chain Mapping Tool, intended to collect and analyse supplier data for over 100 different weapons systems to “identify vulnerabilities and develop mitigation strategies,” as well as the wider employment of AI-driven analytics and data tools to more accurately account for supply chain risks in the DIB.<sup>332</sup>

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**Encouragingly, there is already a growing awareness of the importance of building allies into US defence supply chains at the design stage, particularly for advanced defence capabilities.**

However, in the context of growing defence industrial federation, these mapping efforts will only be as effective as the participation of key allies and partners is extensive. As it stands, there remains much to do to close supply chain domain awareness gaps for key capabilities, materials and technologies. This will be equally important for plugging gaps in existing supply chains and for establishing new supply chain ecosystems alike. Indeed, a lack of mutual insight between the United States, allied governments and industry partners in Australia, Japan and South Korea and elsewhere into the comparative advantages or weaknesses in their respective defence industrial ecosystems has already obstructed efforts to build allied inputs into US precision munition supply chains, compounding with export control and classification issues.<sup>333</sup>

Ultimately, defence industrial integration delivery of long-term payoffs will almost certainly require, as the 2022 NSS states, “incorporating allies and partners at every stage of defense planning,” including in the design of critical supply chains.<sup>334</sup> Encouragingly, there is already a growing awareness of the importance of building allies into US defence supply chains at the design stage, particularly for advanced defence capabilities. For example, on the back of an April 2024 government report, the US Space Force is looking to foster greater supply chain mapping and information-sharing with Australia, Canada and the UK in anticipation of heightened global demand for satellites, launch infrastructure and advanced communications.<sup>335</sup> That same report identified a need to “build understanding between the U.S. and allies regarding each other’s risk-tolerance and goals” with respect to supply chain information-sharing<sup>336</sup> and contributed to a major rewrite of space information classification policies that had previously obstructed collaboration with allied governments and industry partners.<sup>337</sup> The signing of bilateral Security of Supply Agreements (SoSA) with India, Japan and South Korea, respectively, since January 2023 to facilitate greater information-sharing on industrial capacity and requirements, as well as efforts to retrofit Australian and Indian suppliers into US munitions and unmanned system supply chains are emblematic of progress towards a more comprehensive ‘industrial domain awareness’ picture in the Indo-Pacific.<sup>338</sup>

Allies, too, have their own work cut out for them. Indeed, while new activities such as the AUKUS innovation challenges help spotlight technology, talent

and capacity available to the United States from its most trusted allies, these results have proven equally surprising for Canberra despite a long-standing awareness across the defence ecosystem that these resources have been available.<sup>339</sup> Unsurprisingly, supply chain awareness is a standing priority for the Australian defence department and industry alike. For instance, the 2024 Australian Defence Industry Development Strategy noted ongoing work to develop its “industry intelligence capability,” regarded as essential for “industry engagement, solicitation and tender evaluation” in the early stages of new capability development initiatives.<sup>340</sup> For Japan, meanwhile, supply chain mapping and industry preparedness ahead of time will be essential to make sure that efforts to incorporate Japanese companies into federated legacy and cutting-edge defence industrial initiatives do not disappoint due to a lack of capacity or technical proficiency.<sup>341</sup>

#### d. Industrial security standards and private sector capacity

Fourth, harmonising cybersecurity standards for industry participation in US and allied defence projects looms as another major challenge. Much as with defence trade controls, Washington’s concerns chiefly relate to the potential for weakness in allies’ or partners’ defence industrial security measures to be exploited by US adversaries for the purposes of disrupting American production or stealing American intellectual property or intelligence. These anxieties stem both from a lingering historical distrust of allied capacity to protect US information and technology<sup>342</sup> and from a surge in malicious cyberactivity targeting the defence industrial bases of the US and its allies for the purposes of industrial espionage and/or to preposition in anticipation of potential hostilities in future.<sup>343</sup>

The main tension here exists between the imperative of leveraging partners’ industrial capacity and technological expertise to shore up America’s global strategic position and the potential risks to US information and technology that closer digital and industrial integration with these countries could pose if collective cybersecurity standards are insufficient. For instance, while the Pentagon’s 2023 cyber strategy noted the force-multiplying potential

of aggregated US and allied conventional, cyber and industrial capabilities, it also stated that “interdependence also introduces risk” in that American’s adversaries could target weaker allied and partner networks to access or compromise US systems.<sup>344</sup> Meanwhile, the department’s 2024 Defence Industrial Base Cybersecurity Strategy noted that the voluntary adoption of cybersecurity best practices and certification requirements by entities across the defence industrial ecosystem — whether American or foreign-operated — was essential to protecting “domestic proprietary information and production capability” in the interests of “maintaining technology advantage” over adversaries.<sup>345</sup>

In that context, the Pentagon has sought to reform its cybersecurity requirements for companies seeking to bid for major defence contracts, namely through the promulgation of the Cybersecurity Maturity Model Certification (CMMC) 2.0 program for certifying entities’ cyber compliance. Importantly, these standards will apply to *any* company, however great or small and regardless of nation of origin, seeking to do business with the Pentagon. Unsurprisingly, many allies have already sought to engage Washington on the prospects of adopting or mirroring CMMC standards. For instance, Australia has been engaging with the Department on CMMC adoption for some years now,<sup>346</sup> while senior South Korean



An F-35 Joint Strike Fighter production line. Source: US Marines



officials have stated that Seoul seeks to standardise its own 'K-CMMC' processes against US models to facilitate easier cooperation.<sup>347</sup>

Though not yet in effect and undergoing late-stage adjustments, CMMC compliance nonetheless looms as a barrier to advanced defence capability and technology cooperation between Washington and its allies.<sup>348</sup> The issues here are similar to those already faced with respect to the costs of ITAR certification by American SMEs, whereby the expense of seeking external legal advice on export control compliance and of in-house industrial security upkeep often outweigh the financial propositions of working with the Defence Department.<sup>349</sup> Indeed, the 2024 US NDIS notes that stringent cybersecurity requirements — however necessary — could further disincentivise small, sub-tier, dual-use and commercial companies from participating in the defence industrial base to the detriment of its greater resilience and vibrancy.<sup>350</sup> The Pentagon itself has estimated an annual industry-wide compliance cost of over US\$4 billion to the US defence industrial base alone as a result of new CMMC requirements, often needed to protect vast amounts of often unclassified information, the value of control of which has been questioned by informed US experts.<sup>351</sup> Given the premise of a federated defence industrial base, the same challenges will almost certainly be faced by any allied companies wishing to do business with the Pentagon.

On the other hand, it is also the case that the cybersecurity standards of many would-be participants in the United States and federated industrial base are not presently meeting basic requirements. These shortfalls are disproportionately located amongst SMEs across the United States and allied countries alike. This is particularly concerning given the increasing premium placed on a more diversified defence supply chain, including a greater participation of commercial and dual-use SMEs, and worrying figures regarding the numbers of these companies that already struggle to comply with even entry-level standards. Indeed, some recent surveys of American SMEs have returned alarming high percentages of companies “woefully under-secured” but have also shown that many are unable to comply with even Tier 1 CMMC standards for reasons of cost or complexity.<sup>352</sup> Similarly worrying numbers are reflected amongst allied industrial communities, including in Australia and Japan.<sup>353</sup>

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## The scale of Russian and Chinese cyber interference targeting critical infrastructure and industrial espionage targeting high-value commercial and official defence information have also underscored the real industrial security challenges to maintaining a qualitative military technological edge.

The situation is, in short, a tricky one. As one senior US defence official noted recently, cyber threats to defence industrial collaboration stem just as much from building too many firewalls between governments and industry partners as they do from industrial espionage.<sup>354</sup> Yet the scale of Russian and Chinese cyber interference targeting critical infrastructure and industrial espionage targeting high-value commercial and official defence information have also underscored the real industrial security challenges to maintaining a qualitative military technological edge. Although the Pentagon has seemingly tipped its hat to industry as the primary source of talent, knowledge and experience when it comes to setting and administering cybersecurity standards, including for US allies,<sup>355</sup> there are also concerns that leaving assessments of cybersecurity worthiness entirely to industry will produce inconsistent results and potentially price SMEs, especially dual-use or commercial companies, out of the defence market in much the same way that legal costs associated with US export controls have already done.

## e. Protectionist instincts

Finally, protectionist instincts and a new premium on localising defence production in the United States and amongst allies could pose political challenges to the strategic logic of defence industrial integration. Indeed, all five countries surveyed in this report have a stated interest in onshoring defence production for economic benefits and supply chain security, notwithstanding hard realities faced by all with respect to mutual fiscal, industrial, technical and workforce deficiencies. This is particularly important concerning allied investment in the United States. Indeed, rather than simply seeking the means to manufacture and maintain US-origin defence capabilities in their own countries, allied nations have an equal interest in both contributing inputs into collective defence supply chains for American products, and in making investments in the foundations of American power through acquiring US businesses or injecting funding into priority industries.

This tension between protectionism and allied integration was evident throughout the Biden administration's term. In one of his first addresses as US president in 2021, Joe Biden proclaimed that 'Buy America' policy had "become a hollow promise," vowing to put "the weight of the federal government" behind tightening restrictions on the volume of foreign parts in US Government products, including defence capabilities.<sup>356</sup> These sentiments were reflected in a January 2021 Executive Order 14005 on 'Ensuring the Future Is Made in All of America by All of America's Workers,' which increased the percentages of American-origin goods and services that must be contained in products or services purchased by the US Government, and instituted more stringent waiver processes for companies seeking to bypass those restrictions.<sup>357</sup> These measures increased the qualifying threshold for a 'domestic' product from 55% American (a level set by the first Trump administration) to 65% between 2024 and 2028, and up to 75% beginning in 2029.<sup>358</sup> Naturally, these restrictions would also apply to defence products and services. Indeed, in February 2024, the Pentagon issued a final rule reflecting these changes in its own definitions for domestic end products, qualifying country end products, and domestic construction materials, with exceptions for awards made prior to January 2030.<sup>359</sup>

Navigating 'Buy American' and 'Make in America' provisions is not a new challenge for allies and partners. Most already price these factors into their dealings with the US defence industrial ecosystem, and/or have sought workarounds or waiver agreements with Washington. To that end, many have entered in Reciprocal Defense Procurement Agreements (RDPAs) with the United States, arrangements which have historically allowed allied industrial and technology sources to legally qualify as American sources to tender for US defence procurement, though these agreements do not in themselves guarantee allied participation in US programs. Australia enjoys a particularly strong position in this respect, with its RDPA agreement complemented by its addition to the US National Technology and Industrial Base in 2017 and to Title III of the *Defense Production Act* in 2023, strengthening its access and integration into the US defence market.<sup>360</sup> Meanwhile, the 2016 US-Japan RDPA was extended for a further ten years in 2021 based on "the continuing mutually beneficial relationship" on defence procurement.<sup>361</sup>

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All five countries surveyed in this report have a stated interest in onshoring defence production for economic benefits and supply chain security, notwithstanding hard realities faced by all with respect to mutual fiscal, industrial, technical and workforce deficiencies.

Yet there are signs that these arrangements alone may be insufficient to insulate alliance modernisation imperatives from protectionist instincts. Many allies have been confused by Washington's concurrent emphasis on friend-shoring and allied integration on the one hand — including allied investments in the foundations of American power — and a doubling down on 'Buy America' or 'Made in America' provisions for defence procurement that contradicts a key premise of the NDIS.<sup>362</sup> In the wake of EO 14005, the Defence MOU Attache's Group in Washington, inclusive of Australia and Japan, issued a letter to the Make in American Office expressing concern that the "innovation and reduction of cost that comes from integrated supply chains and industrial base cooperation" would be jeopardised by arbitrary domestic content requirements in US government products, disincentivising allied companies from working with the Pentagon and risking reciprocal measures against American products.<sup>363</sup> Leading South Korean experts have also identified these provisions, along with legacy technology control legislation prohibiting overseas acquisition and maintenance like the *Jones Act*, as evidence that Washington remains fundamentally "unwilling to embrace a collective approach" to key defence industrial integration initiatives like naval MRO.<sup>364</sup>

Importantly, the effects of defence protectionism will not be felt equally across America's Indo-Pacific alliances and major partnerships. Though RDPAs may minimise the effects of 'Buy American' provisions on Australia and Japan, the same can not be said for India and South Korea, who do not enjoy similar agreements at the time of writing.<sup>365</sup> Indeed, the Pentagon only announced its consideration of such an agreement with India in 2023,<sup>366</sup> while a proposed RDPA with South Korea was submitted for Government Accountability Office review after it attracted congressional concern that it would unfairly disadvantage American firms were it not sufficiently reciprocal.<sup>367</sup> What is more, a recent Government Accountability Office report found that the Pentagon, among other departments, had not exercised due diligence nor sufficiently coordinated with partner agencies in negotiating and implementing RDPAs, stating that the US Government could, therefore, not be certain that current or future agreements, including those with countries surveyed in this report, would "achieve their pur-

poses."<sup>368</sup> Depending on the fate of these agreements in a new political climate in Washington, efforts to coordinate unilateral defence industrial initiatives in the Indo-Pacific could quickly run up against problems associated with unequal access between participating countries' markets.

Concerns over fairness and reciprocity also point to a broader conceptual tension inherent in the defence industrial integration agenda: between the strategic imperatives of defence integration with capable allies and the commercial realities of US and allied companies competing for business in the global defence marketplace.<sup>369</sup> Scholars have already pointed to evidence of this tension within the context of AUKUS and the US-ROK defence industrial relationship, while strong preferences for the indigenisation of defence capabilities evident in India and Japan also complicate efforts to better posture these relationships for the military elements of strategic competition.<sup>370</sup> Yet, once again, these preferences are not held equally across all countries. Indeed, of the countries surveyed in this report, Australia occupies something of a 'Goldilocks zone': large enough to be a consequential contributor to a US-led defence industrial integration agenda without posing a genuine threat to US commercial interests. By contrast, the growing preferences amongst the Indian, Japanese and South Korean governments for local production — even as they, like Washington, struggle to contend with their own fiscal, industrial, technical and workforce limitations — coupled with all three countries' growing defence export profiles add another degree of political complexity to an already technically and legally fraught endeavour. Reconciling the strategic-commercial logical bind and countries' concurrent preferences for defence indigenisation and integration will both be essential in order for a wider defence industrial federation agenda in Asia to deliver to its fullest.

# Recommendations

Notwithstanding the challenges outlined above, today there exists a strong foundation for this defence industrial integration agenda with Indo-Pacific allies and partners to succeed. While the Biden administration made significant progress, as Jake Sullivan noted at CSIS, much work will fall to subsequent administrations — including the new Trump administration — to implement this agenda.<sup>371</sup> Of course, there are any number of domestic reform efforts that the United States or any of its allies could and should consider for their own national defence industrial base, though many of the factors discussed above are fluid and more appropriately ‘managed’ rather than ‘solved’. Likewise, simply

recommending that all countries considered in this report should ‘spend more money’ or ‘deepen their engagements’ would hardly constitute an original take. Instead, this report offers several broad recommendations for the Trump administration and its partners in Canberra, New Delhi, Seoul and Tokyo to consider as they seek to build out a federated defence industrial agenda in the Indo-Pacific. Priority areas for work include institutionalising new information-sharing practices; deepening industry engagement; collective mapping and simulation activities; coordinated defence industrial security measures; and maximising government efficiencies in defence acquisition and trade.



The Deputy Prime Minister and Minister for Defence, the Honourable Richard Marles MP, British Ambassador to the United States, Dame Karen Pierce, and US Deputy Secretary of State, Kurt Campbell, sign the AUKUS Agreement for Cooperation Related to Naval Nuclear Propulsion in Washington DC, August 2024. Source: Australian Department of Defence

**1. The United States and its allies should explore the potential for collective defence industrial wargaming scenarios that simulate attacks on collective production and sustainment capacity at the same time as conventional hostilities.**

Allied defence industrial wargaming could emulate exercises recently staged by the British Ministry of Defence to coincide with the release of the UK's own defence industrial strategy. These drills were intended to stress-test the resilience of supply chains for artillery munitions and unmanned systems amid a protracted conflict to ensure that the British industrial base is “capable of innovation at wartime speed.”<sup>372</sup> The exercises were informed by previous British Army drills in 2021, which saw the service run out of essential munitions before the 10-day wargame had concluded.<sup>373</sup> Crucially, they also involved industry representatives from major companies, including BAE Systems, MBDA, Lockheed Martin and Babcock, alongside senior UK Government figures.<sup>374</sup>

Washington should seek to establish similar activities with its allies, either in bilateral, trilateral or broader multilateral settings depending on the capabilities in question. Indeed, a key thrust of the Pentagon's Supply Chain Mapping Tool is to collate DIB data and information for exactly these sorts of activities.<sup>375</sup> Rather than simply emulating these at the unilateral level, Washington and its Indo-Pacific allies should also seek to stage similar exercises collectively. As a starting point, this model should be applied in different minilateral settings with a focus on specific capability subsets. For instance, a defence industrial wargame across AUKUS countries could focus on undersea and anti-submarine warfare capabilities across all domains or with

respect to producing ship componentry and increasing sustainment rates with Australia, India, Japan and South Korea in the context of the Regional Sustainment Framework. These could take queues from previous exercises commissioned by the Defense Logistics Agency (DLA) Strategic Plans and Futures Directorate for combat clothing and textiles in October 2023,<sup>376</sup> and build off recent US Army wargames focused on the rapid employment of advanced manufacturing capabilities in conflict scenarios.<sup>377</sup>

In a practical sense, these simulations would need to test not only the capacity of a federated defence industrial base to meet heightened wartime demands but also its capacity to do so in the face of material and digital sabotage efforts. Indeed, Russia's attempts to sabotage European defence production supporting the Ukrainian war effort through cyber-attacks, bombings, industrial interference and even assassinations are instructive.<sup>378</sup> Stress-testing the resilience and capacity of essential industrial inputs and outputs to meet military requirements amid targeted and second-order disruptions at the same time as conventional military deterrence is being tested would complement recent and planned large-scale defence logistics exercises in the region, as well as other specific minilateral drills focussed on surging material readiness such as the Combat Ammunition Production Exercises (CAPEX) recently conducted between Australia, Japan and the United States.<sup>379</sup>

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## 2. Establish or revitalise collective mechanisms to coordinate and harmonise defence industrial security reforms across different partnerships.

Establishing mechanisms dedicated to ensuring the compatibility US and regional allies and partners' industrial security postures will be essential to the success of the defence industrial integration agenda. A prime example of what this might look like can be found in the expanded National Technology and Industrial Base (NTIB) between Australia, Canada, the UK and the United States. Upon the NTIB's expansion in 2019, the four countries agreed to four pathfinder projects intended to identify and mitigate barriers to further defence industrial integration, including reforming controlled technology transfer arrangements, synching investment security practices, building cybersecurity capacity in SMEs, and — importantly — the creation of an NTIB coordination mechanism.<sup>380</sup> However, the coordination mechanism and cybersecurity-building measures for SMEs were seemingly abandoned shortly thereafter as part of a broader 'down-scoping' of the NTIB's remit, with no apparent effort to revive these efforts since.<sup>381</sup> Key architects of the expanded NTIB

has suggested that recent export control reforms between the four countries should prompt renewed efforts either to reconstitute the NTIB coordination mechanism or to create "a similar mechanism under AUKUS, focussed on a wider suite of ecosystemic industrial and supply chain security requirements" required to overcome lingering barriers to greater defence technology co-development and co-production.<sup>382</sup> A strong case could be made that similar arrangements should also be considered for other minilateral defence industrial initiatives. For example, PIPIR should seek to build on the 2024 Core Vision Statement issued at its inaugural plenary meeting to identify at least two viable cross-cutting issues — for instance, cybersecurity and supply chain de-risking — for prioritisation across its four workstreams (sustainment, production, supply chain resilience, and policy and optimisation), including the creation of a mooted "standing industrial advisory board" as quickly as possible.<sup>383</sup>



Japan's Prime Minister Shigeru Ishiba and US President Donald Trump at a meeting at the White House, February 2025.

Source: Getty

### **3. Design future INDUS-X or AUKUS-like initiatives around enhanced information-sharing and industry engagement practices, with an emphasis on delivery before expansion.**

The Trump administration should consider emulating the information-sharing provisions of AUKUS and INDUS-X in defence industrial and technology arrangements with other regional partners, both for enhancing military capabilities and in supporting supply chain integration initiatives. Experts have already recommended expanding or emulating the AUKUS model for greater information-sharing with respect to fast-tracking federated ship maintenance programs in Japan and South Korea, suggesting that the Pentagon take cues from the successful co-development of counterterrorism technologies with close allies through the Pentagon's Irregular Warfare Technical Support Directorate.<sup>384</sup> The industrial 'match-making' functions of INDUS-X and reinforcing efforts to co-mingle supply chains for capabilities like the MQ-9 Reaper, including advanced navigation and ISR componentry, offer valuable lessons for how Washington and its allies might connect their national industrial and technology champions and start-ups alike in the pursuit of specific capability development and supply chain diversification objectives. Future success, however, will depend on engaging with industry on the scope and objectives of such initiatives at a much earlier stage and a greater willingness to share information to that end. Indeed, while AUKUS offers lessons regarding the benefits of information-sharing for fostering interoperability between the existing advanced capabilities of participating nations, challenges associated with engaging with and incentivising industry participation in Pillar II projects in particular suggest that future multilateral defence technology initiatives ought to consider how to facilitate targeted government-private sector engagement and collaboration from the outset. These challenges are also present across the wider US-Australia defence industrial agenda, including Australia's Guided Weapons and Explosive Ordinance (GWEO) enterprise which, as discussed, has effectively assumed its place as an alliance initiative.

Relatedly, the incoming administration will also need to closely consider whether establishing new multi-party defence technology agreements like AUKUS or INDUS-X, or expanding these arrangements to include additional countries, is an appropriate course of action. This is due not only to the relative infancy of both arrangements and ongoing efforts to address long-standing barriers to defence industrial and technology cooperation between the United States and close allies, but also given that the competing strategic and commercial logics that sit behind such collaboration provide both incentives and disincentives for more open collaboration on defence technologies and industrial capabilities. Indeed, these factors have the potential to equally accelerate and obstruct such collaboration. Thus, rightsizing these initiatives in terms of their national representation will be important not only for the sake of attracting the interest of other capable countries in similar initiatives over the long term but also for incentivising and sustaining private sector interest and participation over similar time horizons.

In the case of AUKUS, notwithstanding some recent successes over the last three-and-a-half years, Pillar II cooperation remains largely government-to-government and focussed on honing the interoperability of existing advanced capabilities, with many private sector entities in Australia unsure of how best to engage with AUKUS projects and/or whether the potential benefits of such collaboration will be worth the cost of doing business.<sup>385</sup> There are also concerns that prematurely engaging fourth parties like Japan, even if currently limited to specific project 'bubbles', could risk further complicating already difficult regulatory alignment and harmonisation efforts, progress on which is essential for attracting industry engagement and for delivering a proof of concept for AUKUS Pillar II.<sup>386</sup> Ahead of 2024 NDAA-mandated Pentagon report on prospective pathways for Japanese participation in Pillar II, it will be worth considering how future 'AUKUS-like' initiatives might better integrate industry participation from the outset and the appropriate sequencing for deepening or expanding the scope and membership of these agreements.

#### **4. Strengthen defence industrial ‘domain awareness’ with key regional allies through greater threat-sharing, counter-intelligence cooperation, and supply chain visibility.**

The United States and its allies will need to further enhance their information-sharing practices on industrial security and defence supply chain vulnerabilities. In doing so, all sides will need to embrace a shift towards embracing defence industrial interdependence as a strategic risk worth taking, with defence industrial federation figuring as an essential complement to national efforts to bolster independent capabilities, rather than the former being offset by the latter. Relatedly, they will also need to embrace a culture that accepts the potential risks of wider and more frequent information-sharing on military, industrial, and commercial challenges as a potential cost of success.

Improving collective defence industrial domain awareness will require greater collaboration across multiple levels and stages of the defence industrial ecosystem. Firstly, this will need to include what leading Australian experts have referred to as industrial “threat intelligence sharing” through regular engagements between allied “defense, intelligence, and law enforcement organizations.”<sup>387</sup> This would complement efforts to better integrate supply chains and production capacity through encouraging joint assessments of shared threats as a basis for co-developing protective measures, rather than simply adopting US standards across the board in ways that often disadvantage and disincentivise allied participation. Though these groups could start at the bilateral level and meet biannually to begin with,<sup>388</sup> such engagements should also be pursued at the trilateral and minilateral level for less sensitive technology-intensive initiatives such as ship maintenance and repair through the RSF or PIPIR, or through dormant forums like the NTIB coordination mechanism.

Secondly, the United States and its allies will need to ensure that their information disclosure and release practices are as aligned and permissive as possible. In that respect, the Department of Defense and US military services should, to the maximum extent, seek to emulate the technical and cultural reforms to information-sharing practices pursued by the US Space Force over the last seven years. This includes providing “clarification guidance” to minimise designations of NOFORN for sensitive information relating to defence industrial initiatives and incorporating allied industrial capacity and technological advantages into supply chains for new and emerging defence capabilities.<sup>389</sup> Encouragingly, the Air Force and Navy have both shown an interest in pursuing

similar reforms, and the Trump administration has a record of engaging these efforts. Yet work remains to ensure that this momentum is not squandered. Though previous decrees have often failed to produce lasting changes to classification guidance, further presidential or secretary-level guidance for senior departmental and service leaders, as well as wider efforts to review the incentive structures upon which officials make their risk assessments when it comes to classifying and sharing information, could provide fresh impetus to right-size information-sharing practices for defence industrial collaboration. Likewise, allies will also need to consider whether their own information classification and release procedures are fit for purpose, and to ensure reciprocity in these arrangements to incentivise multi-national buy-in in the pursuit of shared objectives.

Thirdly, and relatedly, the United States and its regional allies will need to leverage wider information-sharing as a means for incorporating allied inputs into capability supply chains. These efforts should go beyond retrospectively integrating allies into legacy system supply chains, but should focus equally on incorporating allied inputs into shared industrial networks for new and emerging capabilities in their early design stage. Doing so will require a new degree of comfort with sharing supply chain vulnerabilities across the US system with a wider range of partners. As discussed, there have been some efforts to incorporate allies into supply chains for legacy — even if priority — capabilities including guided weapons production and naval and aviation MRO, yet progress has been stifled by lingering risk cultures, bureaucratic prerogatives, export controls, and outdated guidance on how and what information can be shared when, with who, and for what cause.<sup>390</sup> Allied efforts to break down these barriers are further complicated by the fact that they must deal with multiple constituencies across the US defence ecosystem, each with their own risk thresholds, priorities and cultures of sharing, while US and allied governments do not always house authorities for these issues in the same department.<sup>391</sup> Indeed, recent research has identified an “ongoing reticence” among a range of US stakeholders, including in the military services, to embrace defence industrial integration initiatives like the GWEO enterprise,<sup>392</sup> including on issues relating to supply chain visibility and redundancy.<sup>393</sup>



At the same time, it is not solely up to Washington to change its ways. Indeed, it will be on allies to develop similarly robust maps of their own defence industrial and technology ecosystems in order to demonstrate their value proposition in any given federated defence industrial initiative. There is evidently work to do on this front. The innovation challenges pursued through AUKUS and INDUS-X have not only spotlighted allied capabilities for US interlocutors, but in several cases have proven equally enlighten-

ing for allied governments themselves, suggesting that they do not necessarily have as deep an insight into their own advantages as they ought to if they are serious about making indispensable contributions to a federated defence industrial enterprise.<sup>394</sup> Stated differently, Washington cannot be expected to integrate its allies into its defence industrial ecosystem if it is unclear exactly what value propositions these partners are offering in return.

## **5. Factor the needs and potential contributions of allies into the Pentagon's impending acquisition and innovation reform spree.**

As customers of — and contributors to — cutting-edge US defence capabilities and technologies, Indo-Pacific allies and partners will be watching impending moves by Congress, the Pentagon and the White House to reform America's defence acquisition systems with keen interest. Indeed, acquisition reform and rapidly fielding disruptive technologies have become top priorities for the new administration and lawmakers alike. New Defence Secretary Pete Hegseth identified “reforming our acquisition process” and “rapidly fielding emerging technologies” among his top priorities,<sup>395</sup> and has emphasised that Combatant Commands and Silicon Valley will both have a bigger influence factored into capability and technology development and procurement decisions in the coming years.<sup>396</sup> President Trump directed the head of the newly created Department of Government Efficiency (DOGE), Elon Musk — who has publicly questioned the utility of major capability programs like the F-35 Joint Strike Fighter — to pursue “hundreds of billions” in program savings across the Pentagon,<sup>397</sup> while businesses specialising in disruptive systems have already implored Musk to revolutionise the department's acquisition processes and regulations.<sup>398</sup> In Congress, Chairman of the Senate Armed Services Committee Roger Wicker has proposed his own ambitious defence acquisition reform by introducing the FORGED Act (Fostering Reform and Government Efficiency in Defense), which aims “to transform the Pentagon for the 21st century” by reducing certain regulatory requirements, tapping commercial innovation, modernising budgeting practices, empowering decision-makers and fostering healthy competition.<sup>399</sup> Importantly, acquisition reform enjoys strong bipartisan support across the House and Senate Armed Services Committees.

With the administration expected to soon issue acquisition reform guidance and with Congress primed to provide enabling legislation, there is a distinct opportunity to enhance defence acquisition and technology development with regional allies and partners. Several leading experts have already noted the importance of doing so. William Greenwalt, a key architect of the expanded NTIB, has previously framed acquisition reform and harmonisation as essential to the successful integration of allies and partners into the US DIB.<sup>400</sup> More recently, a September 2024 MITRE report urged the Pentagon to enhance its engagement with international partners on acquisition and procurement issues, observing that close allies and partners often have world-leading technology solutions available much sooner than US capability development programs, and observing that multinational defence industrial and technology initiatives were “unlikely to be effective” if participants' defence acquisition systems were not sufficiently aligned or connected.<sup>401</sup> One specific technology that has been plagued by this issue in the past on a domestic level is hypersonic weapons, an area in which the US currently trails behind both China and Russia.<sup>402</sup> A component of AUKUS Pillar II, including the AUKUS partners' Hypersonic Flight Test and Experimentation (HyFLiTE) Project Arrangement (PA), allied competitiveness in this area is contingent on the ability to overcome worries about acquisition failure that have historically slowed US development and to accommodate cooperative approaches to technology adoption.<sup>403</sup>

Given the momentum behind the defence integration agenda with the countries surveyed in this report, factoring allies and partners into impending acquisition reform efforts will save future headaches and fast-track contributions by these countries to the US DIB. That reforms will reportedly focus on rapidly developing and fielding disruptive capabilities shares a distinct synergy with the focus of many Indo-Pacific alliance modernisation initiatives, most notably with AUKUS and INDUS-X. Indeed, the Pentagon tipped to double down on defence technology accelerators like the Replicator initiative and to vastly increase funding for mechanisms like the Defence Innovation Unit.<sup>404</sup> In that respect, the Trump administration should heed the successes of integrating allies like Australia into initiatives like the Rapid Defense Experimentation Reserve,<sup>405</sup> a mechanism intended to rapidly solicit, test and field innovative defence-applicable technologies from across industry, allies and academia in collaboration with the Office of Strategic Capital and Small Business Administration.<sup>406</sup> To that end, Washington could consider establishing rapid acquisition cells within different bilateral alliances to translate cooperation on technology development into the rapid deployment of common capabilities at scale.<sup>407</sup>

To be sure, better incorporating a wider range of regional allies and partners into the Pentagon's acquisition process will not necessarily be a simple fix. To do so, the administration will need to consider wider reforms to a range of mechanisms and procedures, including renovating contract tendering and requirements processes to better accommodate allied companies,<sup>408</sup> revisiting foreign military sales and direct commercial sales processes,<sup>409</sup> exploring options for developing multi-sovereign innovation funds like as the NATO Innovation Fund with Indo-Pacific allies and partners,<sup>410</sup> revisiting program budgeting cycles and planning practices,<sup>411</sup> and myriad other issues. Added effect of incentivising allied investment in the US DIB and encouraging partners to heighten and harmonise their industrial security measures if these countries believe that they and their companies will ultimately benefit directly from such investments in a collective enterprise. Likewise, allies and partners will also need to consider where their own reforms and policy changes may be required to make them more attractive partners for the Pentagon, even as they countenance the costs and benefits of harmonisation with the United States.

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**Allies and partners will also need to consider where their own reforms and policy changes may be required to make them more attractive partners for the Pentagon, even as they countenance the costs and benefits of harmonisation with the United States.**

## 6. Further streamline export controls and associated policy frameworks for Indo-Pacific allies and partners.

Related to acquisition reform, the new administration should consider further reforms to regulatory regimes like the International Traffic in Arms Regulations (ITAR) and well-intentioned arms control policy frameworks like the Missile Technology Control Regime (MTCR) to streamline defence exports and co-development projects with allies and partners on cutting-edge defence capabilities. Though the Biden administration made some notable progress on streamlining these regulations and policies to meet its alliance modernisation imperatives, particularly regarding AUKUS, more work remains to be done to ensure that the spirit of these efforts does not fall afoul of outdated assumptions and legal requirements. For example, Australian officials have recently noted that MTCR-related restrictions on technology sharing through AUKUS continue to hamper more ambitious forms of capability development,<sup>412</sup> with the result that recently-enacted reforms to US export controls effectively exclude technologies most closely related to projects under AUKUS Pillar II.<sup>413</sup> As discussed above, these challenges are just as likely to stymie cooperation with India through INDUS-X, and with Japan and South Korea on current and prospective defence technology development initiatives.

The Trump administration's record in its first term, and its creation of mechanisms like DOGE, suggest that there may be appetite to further streamline export controls for select allies and partners in the interests of furthering the defence integration agenda. For instance, the Trump administration reinterpreted its obligations under the MTCR in 2020 to streamline sales of large unmanned systems to countries like India,<sup>414</sup> resulting in New Delhi's recent purchase of nearly 40 MQ-9B Sky Guardian drones discussed above. Further reforms to these regimes and other associated export control reg-

ulations like the ITAR and the EAR could enable Washington to accelerate the selective proliferation of asymmetric capabilities to allies and partners on the frontlines of coercion in the Indo-Pacific. However, for export control reforms to succeed in deed as well as word, they must be made in the spirit of incentivising allies and partners to contribute their own best-in-class technologies to US and cooperative capability development programs, rather than simply expanding US Foreign Military Sales and Direct Commercial Sales portfolios.

In that respect, the new administration should also consider bold executive branch action, as well as collaboration with Congress, to further streamline export controls for trusted allies and partners. Initially, this could include creating reliable mechanisms for extending export control licensing exemptions for limited subsets of defence goods and services to allies engaging with the United States on specific projects or through specific initiatives, such as naval or aviation MRO through PIPIR, RSF or DICAS. More broadly, the new administration — in partnership with Congress — could pursue more ambitious structural reforms to the regulations themselves. This might include addressing their most problematic fundamentals concerning international collaboration (such as the ITAR 'taint' on foreign goods and services) and the addition of a greater degree of discrimination between "existing US technology, predominately allied technology, and jointly developed emerging technology" to facilitate more simple engagements over intellectual property rights and ownership in co-development projects.<sup>415</sup> In short, it will be structural reforms, rather than conditional exemptions, that will make it easiest for the new administration to pursue more ambitious forms of defence industrial and technology cooperation with larger numbers of capable partners.

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