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Identifying Pathways for U.S. Shipbuilding Cooperation with Northeast Asian Allies

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Identifying Pathways for U.S. Shipbuilding Cooperation with Northeast Asian Allies

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Abstract

Military conflict in the Indo-Pacific will demand overwhelming American naval power. The challenges in U.S. shipbuilding, including capacity shortages, industrial base constraints, cost overruns, and delayed delivery, suggest that the United States should explore alternative pathways for delivering capability to the Navy. One option is enhancing cooperation with close allies, such as Japan and the Republic of Korea. The paper identifies options for cooperation such as allied participation in maintenance, repair, and overhaul (MRO), allied purchase and revitalization of U.S. shipyards, various methods of co-production including modular construction, and purchase of allied-built ships.

Executive Summary

Military conflict with China, the United States' clear pacing threat, would require overwhelming American naval might to prevail. With American shipbuilding facing a protracted crisis of delays, cost overruns, capacity shortages, and timeline inefficiencies, the United States may be unable to economically build the ships it needs to project its power in the Indo-Pacific. China continues to grow its commercial and naval shipbuilding sectors at a rapid pace. Without a course correction, the balance of seapower in the Indo-Pacific will continue to swing away from the United States.

New approaches are needed to respond to this shipbuilding crisis. Some of the most promising methods lean on America's unique strength: its network of allies and partners. The United States should consider new shipbuilding cooperative efforts with South Korea and Japan, both shipbuilding heavyweights and close regional allies, to scale U.S. warship production in time to meet China's rising threat. As policymakers consider new modalities to close the shipbuilding gap between the United States and China, questions remain about the advantages and trade-offs inherent to the various pathways of conducting international shipbuilding cooperation with U.S. allies.

The United States is facing the prospect of a maritime conflict with China without the necessary naval assets and shipbuilding resources to decisively win in a prolonged seapower contest. U.S. shipbuilding has long been identified as a problem, but discussions on how to fix it have focused on solely domestic solutions. Recent political shifts towards openness to creative

solutions create the opportunity for the Navy to consider adopting novel strategies which leverage the United States' strong and unique network of allies and partners. This will require thoughtful implementation of security cooperation policy, and especially industrial cooperation policy, which historically has been challenging. For the United States to strike the right balance between leaning on its allies and partners to alleviate its shipbuilding problems and investing in its own capabilities at home—for these are not mutually exclusive—it must properly understand the implications of its various cooperative options with its allies.

This paper is part of the author's broader project to identify, evaluate, and offer recommendations on the possible pathways for U.S. international shipbuilding cooperation with the Republic of Korea (ROK) and Japan.

Issue

The 2022 National Security Strategy identifies China as the United States' pacing challenge. Given the vastness of the Pacific theatre, its vital shipping lanes, and the many regional U.S. allies and partners depending on a persistent American security presence, seapower is critical to the U.S. strategy for promoting a free and open Indo-Pacific and competing with China. However, the United States has long struggled with shipyard capacity and the timely and cost-effective construction of naval vessels (O'Rourke, 2025). The United States has a set of policies to maintain its shipbuilding industrial base, but these have failed to yield a sector that keeps pace with those of potential adversaries (Evans, 2023; Jones & Palmer, 2024, p. 15). The former Secretary of the Navy's April 2024 45-day review of the U.S. shipbuilding industrial base found that many of the Navy's major shipbuilding programs were "one to three years" behind schedule (O'Rourke, 2025, p. 19).

The lack of adequate naval shipbuilding capacity as well as the moribund state of the U.S. commercial shipbuilding industry present significant challenges to the United States' ability to scale production of ships in the event of a conflict. U.S. workforce constraints, facilities limitations, and supply chain challenges have contributed to an inability to deliver necessary capabilities on schedule and at scale. At the same time, China's share of global commercial and military shipbuilding continues to grow rapidly, accounting for 51% of global ship deliveries in 2023, with current trends pointing towards an eventual shift in the maritime balance of power over time (Mandhana, 2024).

In response to this shipbuilding crisis, new modalities are needed, particularly those that lean on America's unique strength: its network of allies and partners. The U.S. Navy could turn to Japan and South Korea for industrial cooperation to scale U.S. warship production, which would represent an important shift in U.S. naval acquisition policy and broader U.S. industrial partnerships with its allies. South Korea and Japan are the world's second and third largest producers of ships and could contribute significantly to U.S. warship production, either overseas or at U.S. shipyards (Mandhana, 2024). Carlos del Toro, the former Secretary of the Navy was remarkably forward-leaning in considering the possibility of looking abroad to reinvigorate the U.S. shipbuilding industry and maritime production, and recent comments from the incoming administration are reported to also be favorable to a rethinking of approaches to increase capacity (Daily, 2024; United States Navy, 2024). However, there is currently a lack of rigorous and public analyses of the potential advantages and challenges of the several pathways of U.S. industrial cooperation on shipbuilding with allies.

Multiple approaches exist to international shipbuilding cooperation, and each comes with its own advantages and trade-offs. They are also not mutually exclusive—the U.S. government may also choose to pursue a combination of pathways. If a multi-pathway approach is taken, an additional consideration would be whether and how cooperation methods affect each other if pursued simultaneously or sequentially, given the possibility of pathways impacting the same

underlying factors, such as labor availability or overall demand, as well as path-dependencies in industrial planning wherein funding one shipyard approach may require the conversion or use of limited yard space.

Moreover, while these approaches could each serve as useful measures to ensure naval capability, they would each have an impact on the long-term health of the U.S. shipbuilding industry. Determining the exact nature of impact of these this impact—be it positive, negative, or a combination of the two with variation across different sub-sectors of the industry—is critical for policymakers as they balance meeting the imminent threat with the strategic need of ensuring the long-term strength of the U.S. shipbuilding industrial base.

Background and Analysis

The Strategic Situation

The U.S. National Security Strategy identified China as the pacing challenge of the United States, and any conflict with China will inevitably require maritime dominance to win given the vastness of the Pacific Ocean and the location of flashpoint areas such as Taiwan, the South China Sea, the Korean Peninsula, and Guam (Biden, 2022). A series of wargames conducted at CSIS found that a conflict over Taiwan would cost the United States significant losses in terms of ships, submarines, and planes, including naval aviation assets (Cancian et al., 2023). While the United States Navy retains a qualitative and tonnage edge on China's People's Liberation Army Navy (PLAN), the pace of PLAN construction greatly exceeds that of the United States Navy (USN; Palmer et al., 2024). Chinese shipbuilding, both naval and commercial, has been thriving. China's shipyards have gone from producing 5% of the world's ships in 1999 to over 50% in 2024 due to vast industrial subsidies, and many shipyards in China embrace the Chinese Communist Party's military-civil fusion strategy and produce warships for the PLAN (Funaiole, 2024).

In a protracted great power conflict, the United States will likely struggle to repair and replace its ships fast enough to keep up with China, let alone construct sufficient new vessels to establish and retain control of the sea lines of communication. Given the well-documented struggles of U.S. shipbuilding, the United States should explore supplementing domestic production with other options for sustaining and growing its naval might. Cooperation with close allies and shipbuilding heavyweights South Korea and Japan offers one possible approach towards solving the United States' shipbuilding challenge.

The United States' Shipbuilding Challenge

The U.S. naval shipbuilding sector faces critical challenges. The most commonly cited issues are skilled workforce constraints, antiquated shipyard infrastructure and equipment, insufficient use of new technology like digital tools and modular construction techniques, and legacy organizational structures (Weddle et al., n.d.). Other analysts point to issues in U.S. design capacity, hyper specialization of military shipyards holding back scalability, and a 20-year backlog of maintenance and repairs restraining the Navy's ability to practice and train with its existing ships (Seavy, 2024). The closure of U.S. shipyards during the 1990s hindered the domestic production of ships, leaving significant gaps that now challenge U.S. industrial readiness (Di Mascio, 2024). The reasons behind the U.S. shipbuilding challenge are the subject of a substantial and growing body of literature, including recent analyses from policymakers such as Senators Jack Reed and Jim Inhofe, as well as many public institutions like the Government Accountability Office (GAO) and the Congressional Research Service and various think tanks (Dallas et al., 1994; Navy Shipbuilding, 2024; O'Rourke, 2025; Reed & Imhofe, 2021).

A near-universally agreed upon challenge that the U.S. shipbuilding industry must overcome is the workforce challenge. A demographic shift away from manufacturing careers, creating recruitment and retention challenges, coupled with the retirement of workers with shipbuilding skillsets, has resulted in an inexperienced workforce lacking proficiency in skilled trades and requiring increased supervision to avoid quality problems (Oakley, 2025b, pp. 27–28). A March 2025 Congressional Research Service report found that part of the challenge in recruiting and retaining new workers is the relatively low wages and benefits in shipbuilding jobs compared to service and retail jobs, where wages have increased in recent years. While service and retail jobs still pay less than shipbuilding jobs, the differential in wages has narrowed, and service and retail jobs are more likely to involve less risk of serious injury, are often located with easier commutes, and are generally done in cleaner indoor settings. Increasing total wages for shipbuilding workers would reestablish a large differential in wages and benefits, but would also substantially increase ship procurement costs (O'Rourke, 2025, p. 23).

Simultaneously, shipbuilders also face challenges in acquiring land for expanding existing shipyard facilities, building new shipyards, or providing housing for workers near shipyards. The Base Realignment and Closure (BRAC) Commission of 1988 resulted in the selling of land access along coastlines, resulting in the closure of four naval shipyards in the 1990s (Di Mascio, 2024). In some places, land could theoretically be repurchased, but at a steep price given that it has since been put to new productive uses. It is difficult to conduct greenfield development along coastlines, as there are limited geographies that have unused coastal access which would be affordable to buy and build on (Hooper, 2023). Even when land is thought to be cheap to buy, shipyards can face high costs when developing the land (for industrial use or especially worker housing) due to industrial contamination which requires expensive remediation (Waxmann, 2024).

Civilian shipbuilding is a critical supporter of naval construction due to returns to scale of shared skillsets, material inputs, and smoothing out demand across time as many shipyards globally build both military and commercial vessels (Schank et al., 2005). Yet the United States has rarely been a world-leading constructor of civilian vessels, except during the immediate vicinities of World Wars I and II (Colton & Huntzinger, 2002). Consequently, maritime historians argue that the United States' strategic culture is split between alignment with the territorial land empires like Germany and true seapower states like Britain—and therefore is less likely to maintain a consistent engagement with the sea via commercial shipbuilding as a fully maritime state would (Lambert, 2019). This lack of persistent cultural and strategic interest is reflected in the poor state of American shipbuilding for most of its history and especially today relative to the rest of the world (Frittelli, 2023).

While analysts debate the root cause of the U.S.'s shipbuilding issues, the U.S. Navy's demand for shipbuilding is only increasing as their budget has risen 12.5% from fiscal year 2020 to 2024, according to the Navy's 2024 shipbuilding plan (Congressional Budget Office, 2023). The disconnect between supply and demand of shipbuilding capacity is a strategic problem for the United States as it faces stiffer global competition from China, including at sea.

U.S. Policy Options

In response to these clear challenges in the face of growing strategic demand, the United States has several possible options, some of which have engaged senior leader interest and support. Senior political figures, such as Senator Mark Kelly and National Security Advisor (and former Congressman) Mike Waltz, have been at the forefront of efforts to revitalize American shipbuilding via domestic investments (Center For Strategic and International Studies, 2024). They published "Congressional Guidance for a National Maritime Strategy" alongside other members of Congress, which proposed incentives for both American shipbuilders as well as carrying American cargo on U.S.-flagged commercial vessels (Waltz et al., 2024). This

congressional effort, recently introduced in the form of the "SHIPS for America Act of 2024," advances the "domestic" policy option, which focuses on revitalizing shipbuilding within the United States (H.R. 10493, 2024).[1] There is a wide and deep body of literature diagnosing the issues in American domestic shipbuilding and there are many studies proposing various policy levers to support its revitalization, with most focusing like the congressmen on generous subsidies and legal privileges for the U.S. shipbuilding industry. This domestic approach has many political and intellectual champions within the United States, including from powerful industry groups which have been active since the 1930s (Paxton & Schonhaut, 2024; Shipbuilders Council of America, 1937).

Some of the most promising, yet less comprehensively studied or advocated for, policy options involve the United States partnering with allies such as South Korea and Japan. Statements from officials in the Trump administration, such as Secretary of Defense Hegseth, as well as from the Biden administration, including former Secretary of the Navy Del Toro and former U.S. Ambassador to Japan Rahm Emanuel, suggest that U.S. policymakers are interested in exploring cooperating with South Korea and Japan to overcome challenges to the naval shipbuilding industry (Politico, 2025; Lagrone, 2024). Even the congressmen's explicitly domestic strategy includes references to assistance from international actors, especially treaty allies such as South Korea and Japan. The Congressional Guidance notes that the United States should "seek mutually beneficial relationships with treaty allies, exploring comparative advantages to lower cost, time, and the complexity of rebuilding America's domestic shipping and shipbuilding industry" (Waltz et al., 2024, p. 6). Indeed, analysts have proposed a variety of international cooperation options, from the realistic and grounded in statements by Navy and political leaders to more theoretical and creative options (Seavy, 2024). The next sections will examine the shipbuilding sectors of U.S. allies and options to leverage their capacities.

Why Cooperate Internationally? Examining Allied Strength in Shipbuilding

Unlike the United States, South Korea and Japan have impressive shipbuilding industries, making them valuable potential partners. Japanese and South Korean shipyards lead the world in contemporary productivity due to technical advancement, though China is rapidly closing the gap, driven by notable gains in productivity (Chao & Yeh, 2020).

South Korea rose as a commercial shipbuilding power between 1970 and 1990 as significant government subsidies, favorable economic conditions such as low labor costs, and technological advancements enabled it to outpace U.S. and European shipbuilders during a challenging period for the global shipbuilding market (Bruno & Tenold, 2011). South Korea has retained its cost-competitive edge even as its labor has grown more expensive alongside the development of its economy. Technological advancements in automation and control systems within its shipbuilding industry have shifted the sector from labor-intensive to technology driven (Min, 2008).

Japanese shipbuilders currently maintain a strong market presence building on their long period of dominance which began after World War II, though they face challenges in competing with South Korean and Chinese shipyards that excel in cost efficiency and rapid construction techniques (OECD, 2016). Japan's focus on high-quality standards and gradual adoption of automation could be enhanced to meet military demands, especially with increased collaboration across maritime technology sectors. Much like South Korea, Japan has a strong focus on automation in its shipbuilding sector for both simple and high-complexity vessels, such as naval ships (Koenig et al., 2003).

[1] This is not the only active legislative proposal to address U.S. shipbuilding. Other notable bills include H.R. 2125, the "Save our Shipyards Act of 2025," introduced by Representatives Mark Green (R-TN), Jen Kiggans (R-VA), and Don Davis (D-NC).

However, U.S. policymakers must also consider the impact that international approaches to shipbuilding may have on the health of the U.S. shipbuilding industry. Some pathways explored later have the potential to boost U.S. shipyard productivity and competitiveness, such as international companies purchasing U.S. yards and incorporating their advanced production techniques. Other approaches have the potential to undermine the long-term health of the U.S. shipbuilding industry, particularly if they direct production to foreign yards at the cost of U.S. shipyards' order books, which can have downstream impacts on labor force retention and the capacity of the U.S. shipbuilding industry in the long run.

South Korea and Japan are not the only U.S.-aligned countries with innovative and effective shipbuilding industries. Other nations may have much to offer the United States in terms of lessons about cost-effective warship construction. Given the scope of the work, however, this project is focused on the ROK and Japan as possible cooperation partners due to their dominance of the commercial shipbuilding market, which gives them significant scale advantage on cost, as well as their history of close industrial cooperation with the United States on military production and sustainment.

Possible Pathways for International Cooperation with U.S. Allies

This study identifies possible pathways for international cooperation on naval shipbuilding with South Korea and Japan. Examples of these potential pathways include:

- allied maintenance, repair, and overhaul of U.S. ships to free up U.S. shipyard capacity;
- allied acquisition of U.S. shipyards to revitalize their production capability;
- joint distributed production of warships via modular construction methods; and
- U.S. purchase of existing allied warship designs from allied shipyards.

Although there are additional avenues of cooperation, these four pathways emerged as the most actionable and reasonable from a survey of public discourse, existing U.S. government policies which can be built upon such as the Regional Sustainment Framework, and CSIS interviews with U.S. and allied industry as well as government officials over the past year (DoD, 2024). Other policy options outside the scope of these pathways and this report have been floated, such as different combinations or divisions of the above ideas or ideas that depend on outside parties such as the global naval export market.

The following sections will discuss possible pathways for cooperation in greater detail. They will describe the most viable identified forms of cooperation within those pathways, as there is often more than one form of activity that the pathway could take and will also review the extant literature relevant to each pathway.

International Cooperation on U.S. Maintenance, Repair, and Overhaul

Maintenance, repair, and overhaul (MRO) activities are essential for ensuring the fleet's operational readiness and long-term availability for action. MRO activities range from routine inspections and maintenance actions like applying surface coatings up to major service life extensions or refits of weapons systems (Marsh, 2024; Office of the Chief of Naval Operations, 2019). Robust MRO capacity enables a nation to maintain combat power during prolonged conflicts and ensure cost-effective and timely servicing of ships during peacetime.

MRO operations in the United States are facing significant challenges. Due to shipyard capacity, the U.S. Navy is estimated to be 20 years behind in maintenance work, leading to the decommissioning of viable ships as a result of its inability to conduct core MRO, modernization, and service life extensions (Seavy, 2024). A March 2025 GAO report identified a lack of capacity in infrastructure and workforce as the main challenges facing ship repairs, resulting in

an inability to perform unplanned work, such as emergency repairs. Even if hiring and retention efforts for skilled labor are successful in ameliorating the widespread workforce shortages, new workers will still be inexperienced, which will likely result in reduced efficiency in the short term (Oakley, 2025a, p. 28).

The report also notes that workforce and infrastructure capacity is dependent on "fleet concentration areas," which are areas where ships are homeported and undergo repair at domestic facilities. The GAO identified the five fleet areas for major repair, located in Florida, Virginia, Hawaii, California, and Washington. If capacity in one fleet concentration area is exceeded, repair work may have to be shifted to other locations (Oakley, 2025a, p. 31). Physical capacity is a main constraint raised by the study, with two of seven shipbuilders having outsourced work to their suppliers, with plans to increase the volume of material they are outsourcing. Another shipbuilder has plans to use outsourcing, and an additional is considering outsourcing if it is awarded a new contract by the Navy. Though outsourcing can reduce physical constraints at shipyards, suppliers often have their own workforce and infrastructure challenges (Oakley, 2025a, p. 25).

Because of these challenges, enabling greater use of allied MRO in the Indo-Pacific region is critical for the strategic goals of the United States and its allies like Japan and South Korea (Tanaka, 2024). This includes the strengthening of supply chains, leveraging the strategic positioning of ports, and expanding MRO capacity (Kim, 2023). By leveraging these international MRO opportunities, some scholars believe that the United States could solve its shipyard dilemma by empowering its domestic yards to focus on facilities and process modernization (Kim, 2023).

The United States has already begun laying the groundwork for greater MRO cooperation across the entire Indo-Pacific with the *Regional Sustainment Framework* (DoD, 2024). One of the core goals of the *Framework* is to leverage existing regional MRO capacity within partner nations, particularly for shared weapons systems operated by allies and partners (Parran & Kirkpatrick, n.d.). Past examples of close MRO cooperation with Indo-Pacific treaty allies include Australia, where the United States has begun an initiative to advance combined regional MRO solutions in support of the *Framework*.[2] Another framework for cooperation is the Defense Industrial Cooperation, Acquisition, and Sustainment (DICAS) Forum between the United States and Japan. DICAS aims to accelerate U.S.-Japan co-development and co-sustainment of defense equipment. Under DICAS are multiple working groups, including the Ship Repair Working Group, which seeks to identify opportunities and challenges for U.S. Naval ships to be maintained by Japanese shipyards (DoD, 2024).

MRO cooperation is a pathway to international cooperation which is already seeing use with the ROK and Japan. The U.S. Navy has been collaborating with Japanese industry on MRO since the end of WWII, when Nippon Aerospace (NIPPI) began servicing assets in 1953. Mitsubishi Heavy Industries (MHI) conducted maintenance on the USS Milius, an Arleigh Burke class guided missile destroyer, in 2019 and signaled their desire for more contracts with the U.S. Navy. In 2024, then U.S. Ambassador to Japan Rahm Emanuel announced plans to build on the 2019 maintenance collaboration with MHI, saying that the U.S. Navy would send some of its vessels to Japanese shipyards for MRO (Wilson, 2024). Japanese companies have also performed MRO activities on some U.S. auxiliary vessels (Tanaka, 2024). Similarly, in August 2024 ROK naval shipbuilder Hanwha Ocean received their first MRO contract with the U.S. Navy to provide services to a U.S. Navy cargo and ammunition ship, the USNS Wally Schirra,

[2] Several courses of action have emerged from the Australian initiative, including Source Qualification and Contracting, Acquisition and Cross-Servicing Agreements, Cooperative Program Agreements, Performance Based Logistics (PBL) Contracts, and Enhanced Intermediate-Level Maintenance (Harrison, 2024).

which has since been completed. (USNS Wally Schirra Completes Major Maintenance at South Korean Shipyard, 2025) In November 2024, Hanwha Ocean received another contract to perform MRO services on USNS Yukon, a replenishment oiler. (Boram, 2024) Another ROK shipbuilder, HD Hyundai, has signed a Maintenance and Ship Repair Agreement (MSRA) with the U.S. Navy which qualifies them to bid for maintenance projects for U.S. combat and support ships. (South Korea's HD HHI Inks MRO Agreement with the US Navy, 2024).

However, the existing literature highlights that shifting MRO work to foreign yards could have economic consequences on the U.S. ship repair and shipbuilding sector (Kim, 2023). Other sources indicate that certain parts of MRO operations, such as ship routine maintenance constitute only a limited part of shipyard economies (Maritime Administration, 2021). This is also supported by the United States' historical experience with shipbuilding during World War II, which suggests that shifting some MRO operations abroad is unlikely to be damaging to the U.S. shipbuilding industry and broader economy (Maritime Administration, 2021). Nevertheless, naval MRO activities during the interwar years were a source of stability for cash-strapped shipyards who were otherwise out of work—even if they were only constituted 0.3% of the value of U.S. private shipyards' total commercial and naval work from 1920–1939 (Smith & Brown, 1948, p. 105).

This pathway requires close study to ascertain the value it can provide the U.S. Navy, especially in terms of how much it will free up new production capacity in the United States and the economic impact on the U.S. shipbuilding industry if these small but routine (and therefore valuable for long-term financial stability) contracts are off shored to U.S. allies. A critical factor in determining the viability of this pathway will be its ability to create new shipbuilding capacity, as the facilities, machinery, and skilled workforce used in MRO operations is not the same as shipbuilding—and may require substantial time and money to switch. The economic appeal of foreign shipyards will depend on the potential magnitude of the market as they consider dedicating existing facilities to U.S. Naval MRO or expanding capacity to support U.S. Navy ships in their home country or third countries such as the Philippines (CSIS interviews with an international shipbuilder, November 18, 2024).[3]

Allied Acquisition of U.S. Yards—Tech Transfer and Productivity Improvements

Allied companies' acquisition of U.S. yards offers another approach for Japanese and South Korean shipbuilders to support U.S. shipbuilding via entering the U.S. market. The goal would be for the purchaser to bring the shipbuilding expertise and efficiencies from the home nation to improve operations of the U.S. yards. The partner company would set up a U.S. subsidiary, which would need to take steps to not be considered under foreign ownership, control, or influence and in turn qualifying as a U.S. company for Jones Act considerations as well as "Buy America" clauses in military contracting.[4] In a highly relevant example, Hanwha Ocean recently purchased Philly Shipyard, having received the necessary regulatory approval. (Hanwha Closes $100 Million Philly Shipyard Acquisition – Hanwha Philly Shipyard, 2024).

There is not just one way for international shipbuilders to become involved in the U.S. domestic shipbuilding market. Through reviews of the literature, qualitative research, and interviews with industry over the past nine months, the following subvariants have emerged as possible sub-pathways:

[3] Allied shipbuilders are opening new facilities across the Indo-Pacific to grow their addressable market (Naval News, 2024a).
[4] Any foreign acquired or built shipyard would need a Facility Clearance (FCL) to be eligible to access classified information. Facilities deemed under foreign control or ownership cannot qualify (*Entity Vetting, Facility Clearances & FOCI*, n.d.).

- International purchase of existing, operational U.S. military yard
- International purchase and renovation of defunct or non-military U.S. yard
- Creation of new government-owned, commercially operated (GOCO) U.S. shipyard with foreign shipbuilders considered in operator bidding pool[5]

The key question with international acquisition of U.S. shipyards in any of these sub-pathways is whether new ownership can improve shipyard performance. Given that the U.S. workforce and material input costs will remain largely unchanged, the key theorized drivers of improvement would be altering management practices, possible cross-training of shipyard workforces, and technology transfer of more advanced foreign shipbuilding techniques to the United States, as well as the accompanying capital infusion required to implement those new techniques.[6] Some of these methods have been publicly discussed by officials from Hanwha as methods to improve their newly acquired Philadelphia yard (Korea Economic Institute of America, 2025). These sub pathways are not mutually exclusive, and selecting one for a given situation would depend on local conditions as well as an assessment of how its particulars would facilitate—or not—productivity gains in general.

Technology transfer is difficult to catalyze and manage properly, especially in the defense sector where national competitiveness and security are paramount concerns (Andrenelli et al., 2019). The United States' experience managing military technology transfer–especially in the DoD–has overwhelmingly been as the provider, rather than the recipient, of technology transfers (Defense Security Cooperation University, 2024). This lack of DoD experience may serve as a complication for this pathway and calls for close study of this pathway so policymakers and implementers are fully aware of potential hurdles and best practices.

A limited literature supports the possible returns of technology transfer from advanced shipbuilding nations like Japan to companies in the United States. One 1988 study found that Japan's Ishikawajima-Harima Heavy Industries' (IHI) technology transfer efforts to American shipbuilders—building on IHI's advanced techniques, such as block construction, process lane systems, and a strong emphasis on material management and design standardization—were able to improve productivity, but not catch the American yards up to Japanese standards (Department of the Navy, 1988). More recent comprehensive studies are lacking, however, providing an opening for scholars to contribute to the extant literature on the possible returns and trade-offs of technology transfer to American shipbuilders.

This pathway has been pursued in recent history. The Italian shipbuilder Fincantieri purchased Wisconsin-based Marinette Marine in 2009, with Lockheed Martin as a minority owner (Fincantieri, 2008). The new company won the competition to build the Constellation-class guided missile frigate in 2020 (although construction challenges including workforce limitations have contributed to late delivery of the first-in-class ship.) Austal, an Australian shipbuilder, started operations in Alabama in 1999 and began to expand rapidly in 2005 after winning a contract to design the Independence-variant Littoral Combat Ship for the U.S. Navy (Austal, n.d.). Foreign shipbuilder acquisition in these cases has brought in new investment and modernization efforts. Fincantieri, since buying its yards in Wisconsin, invested more than $300 million in their new shipyards (Fincantieri Marine Group, 2021). Fincantieri also has leased new yard space in an existing Florida shipyard near Commodores Point in Jacksonville and announced plans to invest $30 million into improvements and modernization there to support its

[5] An additional option raised in discussions with shipbuilders was the possibility of the creation of a joint venture or consortium between U.S. and allied industry to produce ships within an existing U.S. shipyard.
[6] Interviews with foreign shipbuilders raised the examples of investing in capital equipment necessary to enable greater automation as well as bringing over experienced or retiring workers who could aid in training U.S. personnel.

sustainment and repair work (Mathis, n.d.). The recent cases of Fincantieri and Austal provide opportunities for study to support newer cooperation with the ROK and Japan.

These past examples of international acquisition offer some early insight into challenges and opportunities in reaping the benefits of foreign ownership. The benefits of foreign ownership are clear. U.S. yards can benefit from the expertise and innovation from a new parent company. Foreign parent firms with commercial enterprises—a rarity in the United States—can bring the energy and innovative capabilities of the advanced commercial market to the U.S. naval shipbuilding market (Oakley, 2025b, p. 15). For example, foreign shipbuilders with commercial units often use more robotics and automation in their processes such as panel making than U.S. defense shipyards do, a process which can reduce strains on a depleted workforce and improve efficiency (Lo, 2013). Foreign ownership by large shipbuilders can also provide advantages in volume buying of certain products, especially if they are not exclusively military in nature. At a minimum, parent firms can help provide information and negotiation power to their U.S. subsidiaries as they buy components for ships, driving lower costs (CSIS interview with U.S. shipbuilder, April 1, 2025).

On the other hand, while regulatory barriers such as complying with CFIUS and FOCI mitigation are unlikely to pose major barriers given government support, ITAR is likely to pose major challenges. Ship designs are controlled by ITAR, down to the non-military design elements which could benefit from foreign owner's commercial expertise like galley and berth plans (Code of Federal Regulations, n.d.). Even the visits of experts from potential parent companies can involve ITAR, and long-term residency permits to allow foreign expertise to benefit U.S. yards can be difficult to obtain. A further complication is that USN standards and procedures are unique from the rest of the world, and communicating these requirements to foreign parent firms can require an ITAR waiver, preventing the U.S. yard from easily benefiting from foreign expertise (CSIS interview with U.S. shipbuilder, April 1, 2025).

Modularity in Shipbuilding via Distributed Construction

Modularity is part of the advanced shipbuilding approaches employed by South Korean and Japanese shipbuilders. For commercial shipbuilding of massive cargo and tanker ships, imagine taking 250–300 modules assembled in workshops and assembling them like bricks in a drydock (CSIS interview with U.S. shipbuilder, April 1, 2025). Modularity in shipbuilding for this report refers to two separate but related methods, both of which have the potential to improve U.S. shipbuilding capacity.[7]

In the context of international cooperation with the ROK and Japan, modularity would involve two major sub-approaches, both related to distributed construction of ships across U.S. and allied shipyards. Modularity in shipbuilding tends to refer to either 1) *advanced outfitting*, the construction of ship via assembling together pre-furnished modules, such as completing sections of the ship being joined together horizontally and vertically or 2) *modular systems*, the integration of various systems, either weapons or functional components like the power plant, onto a hull in a manner using common standards for key interfaces to enable loose coupling between the manufacture of the ship and of the system.[8]

[7] As defined by a Naval Sea Systems Command (NAVSEA) document cited in a leading report on the topic, modularity is a design approach in which a system has the following characteristics: functionally partitioned into discrete, scalable, and reusable modules consisting of isolated, self-contained elements, a systems engineering process that emphasizes functional analysis and the identification of key interfaces, and common industry standards for key interfaces to the largest extent possible (Schank et al., 2016).

[8] These definitions of modularity link to production. The study will not cover *mission modularity*, which is the idea that ships can use rapidly interchangeable "mission modules" to swap in different capabilities to serve as multi-purpose vessels, as was the concept behind the Littoral Combat Ship (Salisbury, 2023).

Modularity is a key enabler for distributed approaches which can bring in both international shipyards and U.S. subsidiaries of international firms.[9] In the international context, therefore, possibly complementary pathways for the United States to work with its allies include:

- Business-to-Business Distribution: U.S. shipyards subcontract or enter joint ventures to assemble ships from U.S.-built as well as allied-built complete pre-furnished hull modules and systems.
- Government Furnished Equipment: The U.S. Navy procures U.S. and allied-built hull modules and systems directly and provides them for building in the U.S shipyards.
- System Assembly: U.S. shipyards integrate modular systems (i.e., weapons systems, propulsion, etc.) onto pre-built complete ship hulls from the ROK and Japan.

Each form of modular cooperation involves its own advantages and challenges. In general, the literature on the role of modularity in shipbuilding is overwhelmingly positive, with many studies highlighting how flexible and modular designs could help to reduce costs, enhance international cooperation, and support modernization and adaptability. Rains and Johnson highlight the benefits of the potential reduction in ship size while Rubeša, Fafandjel, and Koli as well as Malone emphasize pre-outfitting in modules in workshops minimizing the work that must be done in dry docks (Malone, 2019; Rains & Johnson, 1993; Rubeša et al., 2011). Particularly, three types of modularity and flexibility are identified as having potential for the modernization and adaptability of the U.S. Navy. For modularity, these include common modules, self-contained modules, and modular installations, whereas infrastructure, additional space, and additional ship services are listed for flexibility (Schank et al., 2016). Additionally, the U.S. Navy could benefit from a more optimized and comprehensive approach to modularity, as could be implemented through the integration of standardized components and standardized weapons systems into a collection of ready hull designs (Congressional Research Service, 2024).

Studies of recent shared-build warship programs in the United States, France, and the United Kingdom, identify risk reduction areas, key costs, and potential benefits of international modular shared-build programs and highlight the conditions and circumstances under which multiple-shipyard, modular-building strategies can be adopted (Smallman et al., 2011). The works of Friedman, Lombardi, and Rudd, which outline challenges faced by the United Kingdom with joint shipbuilding in recent history, become particularly insightful to further understand how the U.S. might leverage international partnerships to fill in its aforementioned gaps in production (Friedman, 1999; Lombardi & Rudd, 2013).

One international shipbuilder thought that they could potentially subcontract to other U.S. shipbuilders to provide modules produced in a U.S. subsidiary yard or generators built in other inland facilities (CSIS interviews with an international shipbuilder, October 23, 2024). The business-to-business path was seen as low margin but an appealing as an opportunity to generate early revenue and also to build trust with other shipbuilders who may be otherwise inclined to primarily see new entrants as competition (CSIS interviews with an international shipbuilder, November 19, 2024). Modularity has also been proposed as a solution to domestic U.S. shipbuilding constraints, referred to as “Federated Shipbuilding” or “Nation as a Shipyard” (O’Rourke, 2025, p. 25). Allied firms could plug into these domestic modular approaches as suppliers, if these approaches are adopted, and leverage workforces and materials not just in the inland United States but across U.S. allied nations as well.

[9] Modularity does not require distributed approaches, one international shipbuilder noted that they vertically integrate their hull module and some of their system module production and heavily rely on local supply chains (CSIS interviews with international shipbuilder, November 18, 2024).

Skeptics of modularity, however, point to inefficiencies in the field which can counterintuitively lead to higher procurement costs and delayed timelines (Axe, 2009). This is due to the high degree of skill that complete modularity requires and is evidenced by the costly case of the U.S. Littoral Combat Ship (Axe, 2009). As an additional challenge, some of the efficiency of high productivity yards comes from the equipment they employ to use move the largest of modules, so additional capital investments may be required for some U.S. shipyards to take advantage of offsite module production particularly across the long distances involved.

U.S. Purchase of Ships from Allied Yards

The final currently identified pathway identified by this work is the U.S. Navy purchasing ships that are produced in allied yards. There are numerous sub-pathways for this form of cooperation, which include:

- allied yards building licensed U.S. designs,
- allied yards building a new co-developed design,
- and the United States buying allied-built and allied-designed ships.

Each of these offers different opportunities and challenges, and the existing literature on such approaches are limited due to the novel nature of this idea in American shipbuilding history.

The U.S. purchasing foreign ships is perhaps the most difficult and unlikely pathway, for a number of reasons. Re-using the existing designs for foreign ships would likely offer the most cost effective and rapid solution to American at-sea capacity gaps (Navy Shipbuilding, 2024). However, these ships may not meet the U.S. Navy's specific operational requirements, including full interoperability with U.S. systems. Past experience with the U.S. Navy trying to adapt foreign designs shows that the Navy's tendency to "gold-plate" design requirements can cause scope creep, leading to loss of time and cost efficiency. Moreover, the U.S. Navy's standards and procedures are not shared by other navies, requiring a major rework of allied designs to be acceptable to the Navy. The Navy's attempt to have the existing Italian design of the FREMM frigate quickly converted into the U.S. Navy's *Constellation* class have resulted in a final U.S. design that is reported to bear less than a 15% similarity to the FREMM, down from a planned 85%, at great cost of time and money to the United States government (GAO, 2024; LaGrone, 2024). Some allied designs are similar to existing U.S. designs, such as the ROK's KDX-III Batch I Aegis destroyers, which are said to be based on the DDG-51 *Arleigh Burke*-class of the U.S. Navy (Vavasseur, 2021). Use of these mostly shared designs could potentially ease the compatibility issue.

A new co-developed design could take advantage of partner shipbuilding expertise to incorporate manufacturability in the design phase. However, designing new ships is a notoriously hard and slow process. Modern warships are incredibly complex machines, as even a single amphibious assault ship contains 4.7 million parts from more than 700 companies (Thompson, 2022). The length of time that it takes to design and build new destroyers means that this approach would have a long-time horizon, which also would make it susceptible to changing political winds throughout this duration. While some float this option and link it to potential export sales as a way of spreading out production costs across more customers, the technical and political challenges to this approach—let alone the time horizon—are daunting.

The allied build of U.S. ships alleviates many of these considerations but raises challenges of its own. Designs will need to be licensed to allied yards, which will take time to negotiate, along with securing funding for intellectual property rights. It can take two years for even a comparatively expedited technical assistance agreement to address export controls and the release of closely held American weapon system designs (Interview with international

shipbuilder, November 18, 2024). However, the United States has managed to share its advanced capabilities with Korean shipbuilders before. Korean shipbuilder HD Hyundai recently delivered the ROKS *Jeongjo the Great* to the Republic of Korea Navy, the first of the brand new KDX III Batch II Aegis destroyers and the fourth domestically designed and built ROK Navy ship to incorporate the U.S. Aegis system (Naval News, 2024c).

These alternative approaches all can be used to build warfighting capability through the delivery of additional ships. Another question is whether and how they might address the core concern about the capability and capacity of the U.S. shipbuilding industrial base. A second order consideration of any alternative approach must be this larger strategic issue. While the United States has some partnerships with other nations on specific programs, relying on allies as a complete solution to capability gaps would be unprecedented. Moreover, given the ROK and Japan's location close to China, the possibility of damage to these shipyards during any active conflict must also be considered. Finally, the health of the U.S. shipbuilding industry is not only a national security concern but also a political one, given the well-documented impact of shipyards on their local economies and the interest of Congress in ensuring domestic capability (Keating et al., 2015; Maritime Administration, 2021).

Implication for Policy:

It is no secret that the United States has a shipbuilding problem. The U.S. policy community has long admired the problem and has produced a strong body of work exploring much of the range of possible solutions available to address the problem within the country. However, a continual lack of progress within the United States, the increasingly pressing threat of a fraught naval war with China, and recent shifts in political support for more creative solutions means a window of opportunity is opening for the Navy to consider adopting novel strategies which leverage the United States' strong and unique network of allies and partners. Yet the policymaking community lacks a clear and comprehensive analysis of the options to do industrial maritime cooperation with its highly capable allies and partners.

Security cooperation policy is hard, and industrial cooperation policy can be even harder to get right. For the United States to consider striking the right balance between leaning on its allies and partners to alleviate its shipbuilding problems and investing in its own capabilities at home—for these are not mutually exclusive—it must properly understand the advantages and challenges inherent to each kind of international cooperative activity in isolation and, critically, as they relate to one another. History is littered with attempts at international cooperation which were partially or completely stymied by starting conditions. For example, *Constellation* class ships face three years of delays due to alterations to meet U.S. Navy requirements that lowered commonality from 85% to 15%; both Australia and the United Kingdom have ratified technology control treaties that go largely unused because industry is not confident in the regulatory implementation; and the F-22 fighter jet ended production rather than being exported because investments in exportability which would have addressed technology release concerns were not made at the outset and prove too expensive to retrofit (Greenwalt & Corben, 2023; LaGrone, 2024; Trevithick, 2021). Pursuing any of the pathways would greatly benefit from understanding the prerequisites for success as early in the process as possible.

As the Department of Defense is likely to need to come to a decision on this key issue in the coming years, this project aims to support policymakers as they wrangle with these difficult but critical decisions. This paper identifies the major pathways for international cooperation. Future work will evaluate these pathways using a number of assessments of interest to policymakers, including time to implement, cost to government, economic viability for industry, political and regulatory viability, and creation of new U.S. shipbuilding capacity.

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