



FORGING THE FUTURE FLEET

**A MODERN BLUEPRINT FOR
U.S. SHIPBUILDING WORKFORCE AND
INFRASTRUCTURE RENEWAL**

**A Strategic Research White Paper
by the Smart Development Institute (SDI)
March 27, 2026 (Updated Edition)**



Authors: Roberto Llames | JiAe Sohn | David Fernandez

SMART DEVELOPMENT INSTITUTE
3110 Fairview Park Drive, Suite 120
Falls Church, VA 22042-4536 U.S.A.
1-833-77-SMART or 1-833-777-6278
www.sdinstant.org



FORGING THE FUTURE FLEET
The SAIL FRAMEWORK FOR U.S. SHIPBUILDING WORKFORCE
AND INFRASTRUCTURE REVITALIZATION



A Strategic Research White Paper by The Smart Development Institute

Authors: <u>Roberto Llames</u> <u>JiAe Sohn</u> <u>David Fernandez</u>	March 27, 2026 (Updated Edition)
---	---

Table of Contents

1.	Executive Summary	1
2.	Objectives	3
3.	Understanding Challenges in the U.S. Shipbuilding Industry	3
3.1.	The Workforce Challenge	3
3.2.	Workforce Development and Augmentation	4
3.3.	Outdated Shipyard Infrastructure.....	4
3.4.	Projected Outlook Over the Next 3, 5, and 10 Years	5
3.4.1.	Three-Year Outlook (2025–2028).....	6
3.4.2.	Five-Year Outlook (2025–2030)	6
3.4.3.	Ten-Year Outlook (2025–2035)	6
4.	SAIL Framework - A Four-Pillar Approach to Bridge the Gaps	6
4.1.	Strengthen the Workforce through Workforce Development	7
4.2.	Augment Shipyard Capacity through Workforce Augmentation	10
4.3.	Integrate Digital Modernization through a Privatized AI Ecosystem	12
4.4.	Lead National Engagement through Communication and Outreach.....	14
4.5.	Key Takeaways – SAIL Framework for U.S. Shipbuilding Revitalization	16
4.6.	Visa-Enabled Workforce Deployment Strategy	17
5.	Pilot Program and Initial Deployment Strategy	18
5.1.	Pilot Structure.....	18
5.2.	Pilot Scope (18–24 Months).....	19
5.3.	Training & Deployment Model.....	19
5.4.	Objectives of the Pilot.....	19
5.5.	Scalability.....	20
6.	Governance and Operating Model	20
6.1.	Central Coordination	20
6.2.	Regional Execution Nodes	20
6.3.	Industry Participation.....	21
6.4.	Government Enablement	21



FORGING THE FUTURE FLEET
The SAIL FRAMEWORK FOR U.S. SHIPBUILDING WORKFORCE
AND INFRASTRUCTURE REVITALIZATION



A Strategic Research White Paper by The Smart Development Institute

Authors: <u>Roberto Llames</u> <u>JiAe Sohn</u> <u>David Fernandez</u>	March 27, 2026 (Updated Edition)
---	---

6.5.	Academic and Training Partners	21
6.6.	Advisory and Oversight Structure	22
6.7.	Workforce as a Core System Component	22
6.8.	Scalability and Replication	22
7.	Stakeholders and Call to Action	22
7.1.	Stakeholder Mapping and Call to Action Matrix	23
7.2.	Unified Call to Action	24
8.	Conclusion.....	25
Appendix A: Reference Validation Summary Sheet		26

Figure 1. SAIL Framework – The Four Pillars of U.S. Shipbuilding Revitalization in Quad Helix Framework..... 2

1. Executive Summary

The commercial shipbuilding capacity and maritime workforce of the United States have been weakened by decades of neglect, empowering adversaries and undermining national security. **The nation now stands at a strategic inflection point: the nation must act decisively to restore its shipbuilding strength before decline becomes irreversible** in maritime readiness, growing dependence on foreign powers for critical capabilities, and reduced ability to respond to global crises. **Without decisive action**, the United States risks being unable to project maritime strength, sustain vital supply chains, or defend its economic and military interests at sea during times of conflict. Recognizing these threats, the U.S. Government must act with urgency to pass the **SHIPS for America Act** and fully implement the objectives outlined in the **April 9, 2025, Executive Order on Restoring America’s Maritime Dominance**. These initiatives call for rebuilding the domestic industrial base, strengthening the maritime workforce, and ensuring the long-term resilience of the nation’s shipbuilding infrastructure, all essential to safeguarding national security and economic sovereignty.

To meet these challenges, this white paper, ***Forging the Future Fleet: A Modern Framework for U.S. Shipbuilding Workforce and Infrastructure Revitalization***, presents the **SAIL Framework** for revitalization built on four interconnected pillars, **S**trengthen Workforce, **A**ugment Shipyard Capacity, **I**ntegrate Digital Modernization, and **L**ead National Engagement. Each pillar addresses a core weakness: training capacity, labor shortages, outdated systems, and public awareness, while reinforcing the others to create a sustainable foundation for industrial recovery and maritime resilience. Achieving these goals requires unified and collaborative action across government, industry, academia, and the public under **the Quad Helix model**, working on a shared mission to rebuild capacity.

In the Quad Helix model, **government** sets direction and policy, **industry** drives innovation and execution, **academia** advances research and workforce development, and **citizens** contribute participation and public support. Working together, these four sectors form a **self-reinforcing ecosystem** capable of restoring America’s shipbuilding leadership, ensuring security, and strengthening the nation’s economic foundation. **Building on the Triple Helix model**, where government, industry, and academia collaborate to strengthen America’s shipyards through workforce development, workforce augmentation, and digital transformation, the Quad Helix extends this partnership to include the public. Guided by the SHIPS for America Act and the April 9 Executive Order on Restoring America’s Maritime Dominance, this partnership lays the foundation for maritime revitalization. **As these initiatives may rely on taxpayer investment, engaging the fourth helix, citizens**, through active communication and outreach is essential to foster understanding, transparency, and public trust and acceptance of this national effort to restore America’s maritime strength and economic competitiveness. **Figure 1** illustrates the four interconnected pillars of America’s shipbuilding revitalization strategy under a Quad Helix Framework.

S.A.I.L. FRAMEWORK

A Modern Blueprint for U.S. Shipbuilding Workforce and Infrastructure Revitalization

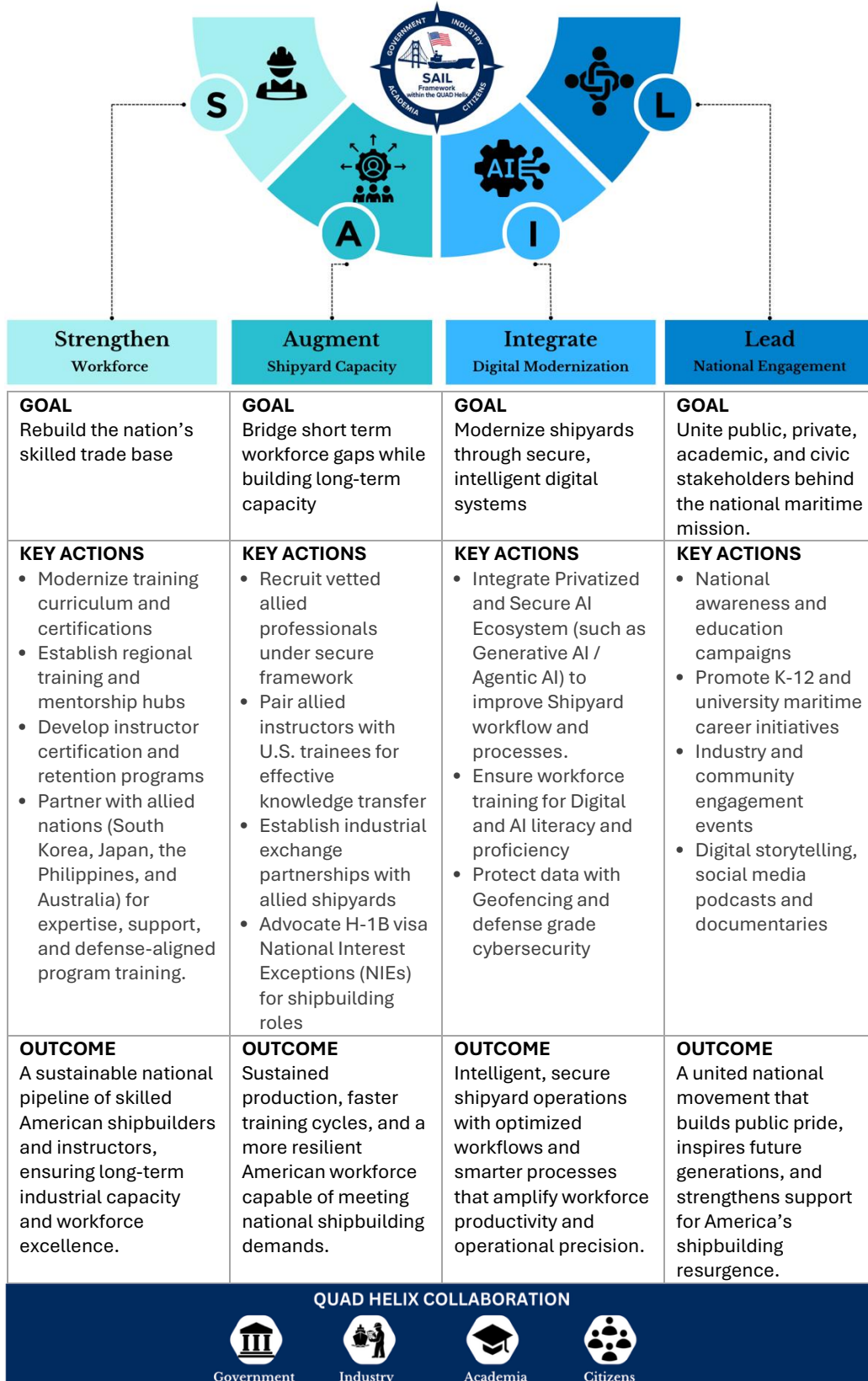


FIGURE 1. SAIL FRAMEWORK – THE FOUR PILLARS OF U.S. SHIPBUILDING REVITALIZATION IN QUAD HELIX FRAMEWORK

2. Objectives

The U.S. shipbuilding industry stands at a defining crossroads. Recent federal actions, most notably the ***Ships for America Act***¹ and **President Trump’s April 9, 2025 Executive Order on “Restoring America’s Maritime Dominance,”**² have created a renewed **national imperative** to rebuild the country’s maritime strength and industrial base. These directives affirm that shipbuilding is essential not only to sustain naval superiority but also to power economic growth, innovation, and national security. **Yet the industry faces critical shortages of skilled workers, outdated training systems, and declining instructor pipelines, even as global competitors modernize at a rapid pace.** Without decisive action, the nation risks losing the industrial resilience needed for maritime readiness.

To turn this national imperative into measurable progress, this white paper outlines the practical **SAIL Framework four-pillar approach** consisting of **(1) Strengthen Workforce, (2) Augment Shipyard Capacity, (3) Integrate Digital Modernization, and (4) Lead National Engagement**, built on the **Triple Helix collaboration** of government, industry, and academia, working together to align policy, capability, and innovation. This cooperative framework ensures that every stakeholder contributes to building a skilled, adaptive, and technologically advanced shipbuilding workforce that supports both defense and commercial goals.

3. Understanding Challenges in the U.S. Shipbuilding Industry

3.1. The Workforce Challenge

The **Government Accountability Office (GAO)** recently reported that “U.S. shipbuilders remain over budget and behind schedule due to worker shortages for meeting the Navy’s demands,” noting that shipyards continue to struggle to recruit and retain staff with the technical skills needed for construction and repair. These workforce and capacity constraints threaten the timely execution of national shipbuilding goals and highlight the urgent need for a coordinated strategy to expand training and strengthen technical capacity across the maritime industrial base.³

¹ H.R. 3151 - SHIPS for America Act of 2025, Congress.Gov, <https://www.congress.gov/bill/119th-congress/house-bill/3151/text/ih>

² Executive Order: Restoring America’s Maritime Dominance, The White House, April 9, 2025, <https://www.whitehouse.gov/presidential-actions/2025/04/restoring-americas-maritime-dominance/>

³ U.S. Navy Shipbuilding Is Consistently Over Budget and Delayed Despite Billions Invested in Industry, GAO, April 8, 2025, <https://www.gao.gov/blog/u.s.-navy-shipbuilding-consistently-over-budget-and-delayed-despite-billions-invested-in-industry#:~:text=The%20Navy%20initially%20planned%20to,at%20blog@gao.gov>

The challenge facing America’s shipbuilding industry is not just about infrastructure or capital, it is fundamentally a workforce problem. As the **U.S. Naval Institute** observed, “**while the physical plant and financial capital hold great importance, human capital determines the survival or collapse of a shipyard.**”⁴ As shipyards invest in modernization, **physical assets can be rebuilt; a skilled workforce cannot be reconstituted overnight.** Furthermore, a recent **McKinsey & Company** analysis underscores this same point, noting that America’s shipyards “face myriad challenges — from talent gaps to outdated operating models” and that increasing output will require addressing “the strained supply of skilled-trade and engineering talent.”⁵

3.2. Workforce Development and Augmentation

Across the country, shipyards face a growing shortage of skilled trades. Welders, pipefitters, electricians, and machinists are in especially high demand. The American Welding Society projects a shortage of more than 360,000 welding professionals by 2027—a gap that threatens to slow or even halt ship production if left unaddressed.⁶ Contributing factors include the closure of industrial education programs, waning interest in blue-collar careers, and stiff competition from other sectors like oil, gas, and construction.

The domestic pipeline alone cannot meet near term demand for skilled labor or instruction. Workforce development is constrained not only by the number of trainees, but also by a shortage of qualified instructors who can train welders, machinists, and other essential trades. **To accelerate capacity building, the United States must complement domestic training with a targeted model that integrates experienced instructors and technical specialists from allied nations.** These individuals support training delivery, strengthen instructional capacity, and transfer critical skills to American workers. This approach reinforces long term workforce development while addressing immediate production constraints.

3.3. Outdated Shipyard Infrastructure

Even with new investments in workforce development and augmentation, the physical and digital limits of U.S. shipyard infrastructure continue to constrain progress. Many facilities still rely on aging equipment, narrow production layouts, and limited training space that leave little room to scale. As the U.S. Government Accountability Office (GAO) has noted, insufficient investment in

⁴ Tyler Pitrof, *The Shipyard Shortage Is a People Problem*, U.S. Naval Institute, September 2024, <https://www.usni.org/magazines/proceedings/2024/september/shipyard-shortage-people-problem>

⁵ *Charting a new course: The untapped potential of American shipyards*, McKinsey & Company, June 5, 2024. <https://www.mckinsey.com/industries/aerospace-and-defense/our-insights/charting-a-new-course-the-untapped-potential-of-american-shipyards>

⁶ American Welding Society. <https://weldingworkforcedata.com/>

modernization and digital integration directly affects performance, delaying the Navy’s shipbuilding goals and weakening the industrial base.⁷

Today’s shipyards need more than upgraded machinery. They require a digitally connected foundation that can support a new generation of intelligent tools. This transformation is driven by the **Privatized AI Ecosystem**, which combines secure, behind-the-firewall applications of both Generative AI and Agentic AI. **Generative AI** assists the workforce by creating and refining blueprints, producing digital work instructions, and simulating complex build scenarios that reduce trial and error. **Agentic AI**, on the other hand, acts autonomously within defined boundaries, monitoring workflows, coordinating schedules, and identifying production bottlenecks in real time, all within the shipyard’s digital perimeter.

Together, these capabilities function as a **force multiplier** and **productivity amplifier**, without replacing people or disrupting workforce continuity. The Privatized AI Ecosystem streamlines information flow, connects siloed data sources, and enhances decision-making across engineering, production, and logistics. **Through GeoFencing controls and defense-grade security**, every digital process remains contained within approved boundaries, ensuring full compliance with data sovereignty and cybersecurity standards.

Modernizing shipyard infrastructure to fully accommodate this ecosystem is essential to restoring efficiency, readiness, and competitiveness. **Without a secure digital backbone that supports AI-driven tools, America’s shipyards risk falling behind in productivity and innovation.** The convergence of these challenges, outdated infrastructure, a depleted skilled trade pipeline, and a shortage of qualified instructors, continues to limit the nation’s ability to rebuild its maritime strength.

According to the National Defense Industrial Association (NDIA), workforce constraints remain the top barrier to expanding shipbuilding capacity and supporting national security priorities. NDIA has called for urgent investment in training, mentorship, and industrial revitalization to avoid undermining the Navy’s long-term fleet objectives.⁸

3.4. Projected Outlook Over the Next 3, 5, and 10 Years

The coming decade will test the capacity and coordination of America’s shipbuilding workforce more than any period in recent memory. **The shortage of skilled engineers, technicians, and digital shipbuilding professionals is expected to deepen as naval and commercial demands expand, placing unprecedented strain on training systems and production schedules.**

⁷ Government Accountability Office (GAO) Report. <https://www.gao.gov/assets/gao-25-106286.pdf>

⁸ National Defense Industrial Association (NDIA). NDIA and Navy TPP Team Up to Grow Next-Gen Shipyard Talent. <https://www.ndia.org/about/press/press-releases/2025/4/30/talent-pipeline-program>

3.4.1. Three-Year Outlook (2025–2028)

In the near term, shipyards will continue to face acute workforce constraints as the Navy’s fleet expansion goals collide with a limited pool of qualified talent. Without a steady pipeline of certified instructors and experienced mentors, new recruits will take longer to reach proficiency, extending production timelines and driving up costs. **Many shipyards will also struggle to implement digital shipbuilding practices due to insufficient training.** Targeted investments in education, mentorship, and selective international recruitment will be essential to stabilize production and rebuild workforce momentum.⁹

3.4.2. Five-Year Outlook (2025–2030)

At the end of the decade, U.S. shipyards will be navigating a critical transition point. The global shipbuilding market, expected to approach \$193 billion, will heighten competitive pressure on American yards to modernize operations and workforce systems simultaneously. Success will depend on dual investment: revitalizing physical infrastructure while scaling advanced training networks. Without coordinated public-private investment in instructor development and technical education, the U.S. risks ceding strategic ground to global competitors.¹⁰

3.4.3. Ten-Year Outlook (2025–2035)

Looking further ahead, the nation’s goal to build and sustain a 390-ship Navy will hinge on one decisive factor: the depth and readiness of its skilled workforce. Achieving this vision will require thousands of tradespeople proficient in both traditional and digital manufacturing methods. National collaboration among shipyards, community colleges, unions, and international partners will be vital to expanding capacity, maintaining production at scale, and close the labor gap.¹¹ If these efforts are realized, the next decade could mark a historic turnaround, restoring the United States as both a naval power and a global leader in maritime innovation.

4. SAIL Framework - A Four-Pillar Approach to Bridge the Gaps

America’s path to restoring maritime strength requires more than isolated programs or temporary fixes. It calls for a comprehensive and sustained framework that addresses the root

⁹ National Academies of Sciences, Engineering, and Medicine. *Research and Education for Maritime Progress*. <https://nap.nationalacademies.org/catalog/20405/research-and-education-for-maritime-progress>

¹⁰ Fortune Business Insights. *Shipbuilding Market Size, Share & COVID-19 Impact Analysis*. <https://www.fortunebusinessinsights.com/shipbuilding-market-103351>

¹¹ U.S. Government Accountability Office. *Navy Needs a Strategic Approach for Private Sector Industrial Base*. <https://www.gao.gov/products/gao-25-106286>

causes of the nation’s shipbuilding challenges. The SAIL Framework outlined in this section: **Strengthen Workforce, Augment Shipyard Capacity, Integrate Digital Modernization, and Lead National Engagement** form an integrated strategy to rebuild capacity, accelerate learning, and modernize operations across the entire industrial base. Each pillar serves a distinct but complementary purpose: to grow the skilled labor pipeline, strengthen the teaching and technical core, digitize and secure production systems, and align the public narrative behind a revitalized national mission. Together, these pillars provide a practical roadmap for transforming today’s fragmented efforts into a coordinated movement capable of closing the workforce gap and securing America’s shipbuilding future.

4.1. Strengthen the Workforce through Workforce Development

Workforce Development anchors the nation’s shipbuilding revitalization strategy and serves as the first pillar of sustainable industrial recovery. It focuses on rebuilding the foundation of America’s skilled trade base through modern, competency-based training programs aligned with shipyard and supplier requirements. Guided by the **Triple Helix model**—a collaborative framework uniting government, industry, and academia—this initiative ensures that workforce programs are both strategically coordinated and outcome-driven.



The Workforce Development pillar establishes a national framework that expands capacity, accelerates skill acquisition, and standardizes instruction across the maritime industrial base. Key elements include:

- **Curriculum Modernization:** Align training standards with U.S. Department of Labor frameworks across critical trades such as welding, pipefitting, marine electrical systems, and mechanical work.
- **Competency-Based Certification:** Develop clear credentialing pathways to verify skill mastery and improve mobility within the industrial workforce.
- **Integrated Learning Models:** Combine simulation-based and hands-on training methods to reinforce real-world readiness and production safety.
- **Regional Training and Mentorship Hubs:** Create geographically distributed centers of excellence to provide accredited instruction, mentorship, and instructor development supported by the Triple Helix collaboration.
- **Instructor Development and Retention:** Build a structured national effort to train, certify, and retain qualified instructors capable of scaling skill development nationwide.

This strategy, however, faces strong headwinds due to a persistent shortage of instructors and technical trainers. The current domestic pipeline cannot meet the near-term demand for teaching personnel needed to sustain training momentum. To support this effort, **the Shipbuild Talent Hub adopts an instructor-led capability transfer model** that brings in

experienced trainers and technical mentors **from allied shipbuilding nations, including South Korea, Japan, the Philippines, and Australia**, to strengthen domestic training capacity. Each nation contributing distinct strengths aligned with workforce development, technical excellence, and national security priorities. Recruiting qualified instructors and technical specialists from these allied nations is a prudent and necessary interim measure when managed under a secure and structured framework. **South Korea, Japan, the Philippines, and Australia** each maintain long-standing defense and industrial ties with the United States, reinforcing shared security and maritime objectives while contributing distinct capabilities across training, technical expertise, and defense-aligned collaboration. **Their participation can bridge immediate instructional gaps without displacing American workers or compromising sovereignty.** This approach strengthens knowledge transfer, maintains production within U.S. facilities, and reflects proven collaboration models already used across U.S.-aligned defense and aerospace partnerships.

South Korea

As one of the leading nations in commercial shipbuilding, South Korea is known for its advanced modular construction techniques and extensive use of automation in shipyards such as Hyundai Heavy Industries and Samsung Heavy Industries. South Korea's maritime training institutions, including Korea Maritime and Ocean University, produce highly skilled engineers, technicians, and quality control professionals. These individuals possess deep expertise in digital shipyard operations and can contribute significantly to U.S. shipbuilding modernization efforts and training initiatives.

While South Korea is a global leader in shipbuilding, it is also currently grappling with significant labor shortages exacerbated by an aging population and declining birth rates. The shipbuilding industry faces an estimated shortage of around 14,000 workers, with projections indicating a need for an additional 45,000 to meet current demands.¹² Efforts to mitigate this include expanding skilled worker visa quotas and establishing training partnerships with neighboring countries.

Japan

Japan has a long-standing tradition of precision shipbuilding and is a global leader in robotics and smart manufacturing. Educational institutions such as the National Institute of Technology (KOSEN) and the Japan Maritime College focus on hands-on engineering, automation, and safety practices. Japanese professionals are known for their discipline, attention to detail, and expertise in integrating advanced technologies into production workflows. These capabilities make Japan a valuable source of instructors, mentors, and innovation leaders in digital shipbuilding environments.

¹² Stimson Center. (2023). *Waypoints and Course Adjustments: Toward Naval Shipbuilding Cooperation with South Korea*. Retrieved from: <https://www.stimson.org/2025/waypoints-and-course-adjustments-towards-naval-shipbuilding-cooperation-with-south-korea>

Japan's shipbuilding sector is similarly affected by demographic shifts, with a rapidly aging population and a shrinking workforce. A recent Reuters survey revealed that two-thirds of Japanese companies are significantly impacted by labor shortages due to the country's declining and aging population.¹³ The government has implemented measures such as raising the retirement age and encouraging older individuals to remain in the workforce. Despite these efforts, the labor shortage remains a pressing issue, particularly in industries like shipbuilding that require specialized skills.

Philippines

In contrast to the aging workforces in South Korea and Japan, the Philippines boasts a young, dynamic, and highly skilled maritime labor pool. The country is the world's largest supplier of maritime labor, with over 30% of global seafarers originating from the Philippines.¹⁴ Filipino professionals are renowned for their strong English proficiency, adaptability, and hands-on shipyard experience. The Philippines' robust network of maritime training institutions, certified by the International Maritime Organization (IMO) and overseen by agencies like the Technical Education and Skills Development Authority (TESDA), ensures a steady supply of competent maritime workers.

Moreover, the Philippines has a history of providing skilled labor to both South Korea and Japan to support their shipbuilding industries. This established track record positions the Philippines as a reliable partner for workforce development initiatives aimed at revitalizing the U.S. shipbuilding sector.

Australia

Australia brings a unique and strategically aligned capability to workforce development through its deep integration with the United States in defense and maritime operations. As a key partner under the AUKUS security framework, Australia is actively investing in naval shipbuilding, submarine programs, and the expansion of its own industrial base.^{15 16} This alignment creates a natural pathway for collaboration in training, instructor development, and workforce readiness that extends beyond traditional labor exchange models.

¹³ Reuters. (2025). Japan Firms Face Serious Labour Crunch as Aging Population Bites. Retrieved from: <https://www.reuters.com/sustainability/sustainable-finance-reporting/japan-firms-face-serious-labour-crunch-aging-population-survey-shows-2025-01-15>

¹⁴ Institute of Developing Economies – JETRO. (2020). Maritime Education in the Philippines: Nurturing the World's Seafarers. Retrieved from: https://www.ide.go.jp/library/English/Publish/Reports/Brc/pdf/re32_03.pdf

¹⁵ Fact Sheet: Implementation of the AUKUS Partnership. April 6, 2022 <https://securityanddefenceplus.plusalliance.org/wp-content/uploads/2023/12/AUKUS-Briefing-Book-Joint-Statement-Fact-Sheet-Implementation-of-the-AUKUS-Partnership.pdf>

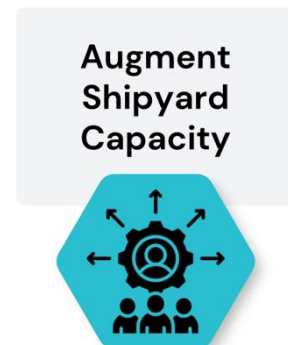
¹⁶ Australian Government, 2024 Department of Defence. Naval Shipbuilding and Sustainment Plan. <https://www.defence.gov.au/about/strategic-planning/2024-naval-shipbuilding-sustainment-plan>

Australia’s maritime and defense training institutions, supported by organizations such as TAFE and the Australian Maritime College, emphasize applied engineering, systems integration, and safety within highly regulated environments.^{17 18} Australian professionals often possess experience working within defense programs that require strict adherence to security protocols, quality assurance standards, and complex program coordination.¹⁹ These capabilities position Australia as a valuable partner in developing advanced instructors, mentor-level personnel, and program leaders who can support the maturation of U.S. shipyard training ecosystems.

Unlike larger labor-supplying nations, Australia’s contribution is best understood as high-value and targeted. Its role centers on strengthening leadership development, enhancing instructor quality, and supporting secure knowledge transfer within defense-aligned shipbuilding environments. This collaboration reinforces the broader objective of building a resilient and self-sustaining American workforce while maintaining close coordination with trusted allies operating under shared security and industrial frameworks.²⁰

4.2. Augment Shipyard Capacity through Workforce Augmentation

The shortage of qualified instructors and technical trainers remains the most immediate constraint to expanding the U.S. shipbuilding workforce. **While Workforce Development establishes the long term foundation, it cannot scale quickly enough to meet current production demands. Workforce Augmentation therefore serves as a targeted extension of workforce development,** focused on strengthening instructional capacity, supporting specialized roles, and stabilizing production timelines during the transition period.



This strategy is built on collaboration, not substitution. Allied professionals work within American facilities, under American standards, and alongside American mentors and apprentices, with certain partners also contributing experience from defense-integrated shipbuilding programs that reinforce security, quality assurance, and complex program coordination. Their purpose is to strengthen instruction, share advanced methods, and help stabilize production timelines across shipyards that face the steepest shortages of skilled labor. Each engagement is temporary, targeted, and focused on transferring knowledge directly to U.S. workers so that these skills remain part of the national industrial base.

¹⁷ TAFE Directors Australia. About TAFE and Vocational Education System. <https://www.tda.edu.au>

¹⁸ University of Tasmania. Australian Maritime College Overview. <https://www.utas.edu.au/amc>

¹⁹ Australian Government, Department of Defence. Defence Industry Development Strategy. <https://www.defence.gov.au/about/strategic-planning/defence-industry-development-strategy>

²⁰ Australian Government, Department of Foreign Affairs and Trade (DFAT). Australia–United States Alliance Overview. <https://www.dfat.gov.au/geo/united-states-of-america>

The Workforce Augmentation pillar focuses on several coordinated actions:

- **Allied Instructional Support:** Bring in qualified instructors and technical mentors from partner nations such as Japan, South Korea, the Philippines, and Australia to fill short-term gaps in teaching and training, with contributions ranging from trade instruction to advanced, defense-aligned mentorship and program support.
- **Knowledge Transfer Agreements:** Pair allied specialists with American trainees and instructors to ensure that practical skills, advanced techniques, and program-level expertise are passed on to the domestic workforce, strengthening both technical proficiency and leadership capacity.
- **Security and Vetting Framework:** Operate under strict U.S. Department of Defense security protocols, including background screening and facility access controls, to maintain the highest standards of safety and confidentiality.
- **Industrial Exchange Partnerships:** Create opportunities for American personnel to observe and learn within allied shipyards, including those operating within defense-integrated environments, building familiarity with modern production systems, security protocols, and shared operational standards.
- **Capacity Bridging:** Maintain production stability and training continuity while new domestic instructors complete certification and readiness programs.
- **Defense-Aligned Workforce Collaboration:** Leverage partnerships with closely integrated allies to incorporate experienced personnel who can support secure training environments, mentor instructors, and contribute to program-level coordination within complex naval and submarine shipbuilding efforts.

To support this model, **the United States can make use of existing legal and compliant working visa pathways that allow qualified instructors and specialized experts to participate in workforce development initiatives.** These pathways provide a structured and regulated mechanism to bring in allied expertise where it is most needed, particularly in roles that support training, instruction, and advanced technical capability.

Policy adjustments will be required to ensure that these working visa pathways are aligned with national workforce and industrial priorities. This includes enabling targeted participation for allied instructors and specialists who contribute directly to training capacity, knowledge transfer, and production readiness within secure shipbuilding environments. **Any such measures should remain focused, controlled, and aligned with the broader objective of strengthening the domestic workforce rather than replacing it.**

Workforce Augmentation therefore serves as a practical bridge between present need and future self-sufficiency. It enables shipyards to keep pace with naval production goals, protects the quality of instruction, and supports the steady expansion of the domestic talent pool. When integrated with the Workforce Development framework, this approach strengthens the entire

maritime industrial base and ensures that America’s shipbuilding revival continues without interruption.

This model is operationalized through SDI’s role as a talent deployment platform, enabling the recruitment, visa sponsorship, and placement of qualified personnel into U.S. shipbuilding environments in coordination with partner institutions and industry stakeholders.

4.3. Integrate Digital Modernization through a Privatized AI Ecosystem

As the workforce foundation strengthens through development and augmentation, the next step in rebuilding America’s shipbuilding capacity is to give that workforce the modern tools it needs to perform at its best. The shipyard of the future depends not only on skilled people but also on intelligent digital systems that extend their capability, simplify complex tasks, and ensure that every process operates with precision and coordination. Digital Modernization delivers this capability through the **Privatized AI Ecosystem**, a secure, behind-the-firewall network of **Artificial Intelligence** systems designed specifically for the defense industrial base and governed entirely within the shipyard’s digital perimeter.



This proposed Privatized AI Ecosystem has already been implemented and validated in two of the largest county governments in Virginia where scale, security, and coordination are critical to daily operations. These deployments have shown how secure AI systems can transform complex workflows into faster, more transparent, and more efficient processes while keeping all data within a protected digital perimeter. The results demonstrate that when artificial intelligence is implemented responsibly, within a controlled infrastructure and guided by clear governance, it can streamline communication, accelerate decision-making, and reduce administrative burden across departments. **The same proven model can be applied to shipyards to enhance coordination, strengthen safety oversight, simplify documentation, and improve production efficiency from planning to delivery.**

Within this ecosystem, two complementary forms of AI work together to enhance human capability: **Generative AI** and **Agentic AI**.

Generative AI strengthens the informational and creative backbone of the shipyard. It assists engineers, planners, and managers by supporting **Ship Design, generating blueprints, creating work instructions, drafting reports, and summarizing complex technical documents.** Examples adapted from county deployments include:

- **AI Chat Assistants** that help staff compose emails, maintenance reports, meeting notes, and shift summaries securely within the shipyard network.
- **Knowledgebase Assistants** integrated into collaboration tools such as Microsoft Teams, allowing workers to ask operational or safety-related questions and receive instant, validated answers from approved internal manuals, training materials, or defense documentation.
- **AI-Driven Procurement Tools** that analyze usage patterns and supplier data to help logistics teams plan material purchases, optimize inventory, and reduce waste.
- **Policy and Compliance Assistants** that provide real-time guidance on OSHA standards, Navy technical manuals, and evolving defense production policies, saving hours of manual research and improving regulatory compliance.

Agentic AI operates as the digital workforce inside the shipyard, performing context-aware actions that mirror many of the support functions handled manually today. These systems automate recurring administrative and operational workflows under strict rules and permissions. Applications include:

- **Maintenance and Inspection Agents** that guide technicians through inspection checklists, log results, and automatically update digital maintenance records.
- **Work Order Agents** that walk supervisors through repair request forms, route them for approval, and notify the appropriate trade teams—all within secure systems like Dataverse or SharePoint.
- **Production Coordination Agents** that monitor work progress, flag delays, and suggest schedule adjustments based on material availability or workforce readiness.
- **Customer and Workforce Support Agents** that respond to routine inquiries about safety training, facility access, or project status, freeing up human staff for higher-level work.

Looking ahead, this same ecosystem can also incorporate **robotics and autonomous drones** as physical extensions of Agentic AI. These systems can perform repetitive or high-risk tasks such as inspecting hull integrity, monitoring safety zones, and transporting materials across the yard. Operating entirely within the shipyard’s secure boundary, these autonomous systems act as sensor-equipped agents—collecting data, making micro-decisions, and executing actions under the same governance and cybersecurity framework that governs all digital operations. The Digital Modernization pillar focuses on several key actions:

- **Secure AI Integration:** Embed the Privatized AI Ecosystem into shipyard networks to maintain data sovereignty and comply with defense security standards.
- **Workforce Enablement:** Train shipyard personnel and instructors to use AI confidently so that technology becomes an everyday tool for safety, productivity, and efficiency.
- **Data Interoperability:** Connect engineering, logistics, and training systems through unified data platforms that enable seamless information sharing and faster decision-making.
- **Production Optimization:** Apply AI insights to scheduling, materials management, and quality assurance to improve consistency and performance across projects.

- **Continuous Learning:** Create digital feedback systems that capture lessons from each ship or module built and feed them back into planning, training, and process improvement.

Digital modernization does not replace people; it enhances them. The Privatized AI Ecosystem allows every worker, from apprentice to supervisor, to perform at a higher level of precision and efficiency while maintaining the craftsmanship and judgment that define American shipbuilding. **When combined with strong workforce development and targeted augmentation, digital modernization transforms shipyards into intelligent, coordinated enterprises that are secure, adaptive, and ready to meet the needs of a modern fleet.**

While the three pillars strengthen the technical foundation of the shipyard, true transformation also depends on communication, understanding, and collaboration. **The success of this new industrial ecosystem will rely on the ability to share its vision, build public awareness, and align educators, policymakers, and communities around a common purpose.** This final pillar completes the evolution from the **Triple Helix** model, linking government, industry, and academia, to a **Quad Helix** framework that includes citizens as active participants in revitalizing America’s shipbuilding base. The next pillar, **Communication and Outreach**, focuses on uniting these four forces to sustain national momentum and shared commitment behind America’s maritime revival.

4.4. Lead National Engagement through Communication and Outreach

The national effort to revitalize America’s shipbuilding industry, set in motion through the **Ships for America Act** and the **April 9 Executive Order on Restoring America’s Maritime Dominance**, requires more than workforce revitalization and digital modernization. It also depends on the nation’s collective understanding of why this mission matters. **Communication and Outreach** ensures that the progress achieved through Strengthening the Workforce, Augmenting Shipyard Capacity, and Integration of Digital Modernization becomes a **shared public commitment supported by every sector of society.** A key strategic objective for the *Congressional Guidance for a National Maritime Strategy – Reversing the Decline of America’s Maritime Power* is **calls for public outreach to demonstrate how American shipbuilding and U.S.-flag shipping are critical to national security, and that maritime workers are essential.**²¹ This final pillar expands the traditional Triple Helix model of government, industry, and academia into a **Quad Helix**, which includes citizens as active participants in rebuilding America’s maritime strength.

**Lead National
Engagement**



²¹ CONGRESSIONAL GUIDANCE FOR A NATIONAL MARITIME STRATEGY - Reversing the Decline of America’s Maritime Power, Page 5, April 30, 2024, <https://www.kelly.senate.gov/wp-content/uploads/2024/05/Congressional-Guidance-for-a-National-Maritime-Strategy.pdf>

The U.S. Merchant Marine, U.S. shipbuilding and repair facilities, the Nation’s port system, and supporting industries, collectively known as the U.S. maritime industry, integrates our economy with a vast global system that moves more than 90 percent of the world’s trade by tonnage, including energy, consumer goods, agricultural products, and raw materials.²² **Yet many citizens do not realize** that shipbuilding and maritime logistics directly influence the price of consumer goods, the reliability of supply chains, energy security, and even emergency response capabilities during national crises. **This lack of awareness weakens public support for industrial investment** and obscures the role of maritime workers as essential contributors to national security and economic resilience. **The Communication and Outreach pillar addresses this gap by bringing the maritime story to the forefront of national understanding.** It aims to show how every community, from coastal shipyards to inland manufacturing hubs, depends on a strong and self-sufficient shipbuilding base. Through consistent messaging and education, this pillar connects the industry’s strategic objectives to the everyday lives of American citizens, transforming the shipbuilding mission into a shared source of pride and purpose.

The **Communication and Outreach** pillar translates national maritime policy into public understanding and civic participation. Its goal is to turn legislation and industrial strategy into visible, relatable progress that citizens, educators, and community leaders can recognize and support. Achieving this requires a coordinated effort to highlight the economic, technological, and cultural importance of shipbuilding across all forms of media, education, and community engagement. Through promoting awareness at every level, from Congress to classrooms, this pillar ensures that America’s maritime resurgence is sustained by informed citizens and future generations who see themselves as part of the nation’s industrial story.

The Communication and Outreach pillar focuses on several key actions:

- **National Awareness Campaigns:** Launch collaborative initiatives with federal, state, and local partners to communicate how shipbuilding strengthens economic growth, national defense, and community resilience.
- **Educational and Workforce Partnerships:** Integrate maritime and manufacturing topics into K–12, vocational, and university programs, inspiring students to pursue careers in the trades, engineering, and maritime management.
- **Public-Private Collaboration:** Coordinate with industry associations, unions, and academic institutions to ensure consistent messaging about the value of domestic shipbuilding and allied cooperation.
- **Community Engagement:** Develop shipyard open houses, public exhibits, and media features that showcase modern shipbuilding technologies, workforce opportunities, and success stories.
- **Digital and Media Outreach:** Leverage traditional and digital platforms—television, social media, podcasts, and documentaries—to share innovation milestones, workforce achievements, and the everyday relevance of the maritime industry.

²² U.S. Maritime and Shipbuilding Industries: Strategies to Improve Regulation, Economic Opportunities and Competitiveness, March 6, 2019, <https://www.transportation.gov/testimony/us-maritime-and-shipbuilding-industries-strategies-improve-regulation-economic>

Effective communication builds trust, strengthens resolve, and turns national policy into shared purpose. Through coordinated outreach and education, every American can see the connection between shipbuilding and the nation’s prosperity, security, and technological progress. Together, the four pillars of the SAIL Framework: **Workforce Development, Workforce Augmentation, Digital Modernization, and Communication and Outreach** form a complete framework for restoring America’s maritime power. Each pillar reinforces the others: developing skilled people, expanding instructional capacity, integrating advanced digital tools, and uniting the public behind a clear national mission. When guided by the principles of the **Quad Helix**, this framework transforms shipbuilding from an industrial challenge into a collective enterprise—one that advances economic opportunity, strengthens national defense, and reaffirms America’s leadership on the world’s oceans.

4.5. Key Takeaways – SAIL Framework for U.S. Shipbuilding Revitalization

Four Pillars of the SAIL Framework	Core Takeaway
Workforce Development	Strengthen the workforce by establishes a sustainable national pipeline of skilled shipbuilders and instructors to rebuild America’s industrial capacity.
Workforce Augmentation	Augment Shipyard Capacity by bridging immediate labor gaps through secure, allied workforce collaboration that strengthens U.S. production and training continuity.
Digital Modernization (Privatized AI Ecosystem)	Integrate Digital Modernization by equipping shipyards with secure, intelligent systems that amplify workforce productivity and operational precision.
Communication and Outreach	Lead the Nation by uniting the public, industry, and government behind a shared maritime mission that restores national pride and long-term support.



Beyond the four pillars, the SAIL Framework gains its full strength when viewed through the Quad Helix model, which positions government, industry, academia, and citizens as equal partners in revitalizing America’s shipbuilding base. Each pillar reflects the contribution of one sector, but it is their combined momentum that creates a durable national strategy. **Government** sets policy direction and investment priorities; **Industry** drives innovation and execution; **Academia** produces the workforce and advances research; and **Citizens** provide the public understanding and support needed to sustain long-term maritime revitalization. Together, these four sectors create a self-reinforcing ecosystem where training, augmentation, modernization, and outreach move in alignment, ensuring that the SAIL Framework does not operate as separate initiatives but as a unified national effort to rebuild shipbuilding capacity and restore America’s maritime strength.



4.6. Visa-Enabled Workforce Deployment Strategy

The Shipbuild Talent Hub is supported by a structured and flexible set of **working visa pathways** that enable the timely and controlled deployment of qualified instructors, skilled personnel, and specialized experts from allied nations.

A central and enabling component of this approach is the use of **cap-exempt H-1B visa pathways**, available through qualified nonprofit and academic partnerships. This pathway allows for year-round deployment of instructors, technical specialists, and certain skilled professionals into roles that directly support workforce development, training delivery, and specialized shipbuilding functions. Its flexibility and exemption from annual caps make it a reliable mechanism for scaling talent deployment in alignment with institutional and industry needs.

To ensure operational resilience and the ability to address a broader range of workforce requirements, the model incorporates **additional visa pathways**, each aligned with specific roles and use cases:

- **O-1 Visa (Specialized and High-Impact Experts)**
 Used for highly experienced professionals with advanced expertise in areas such as naval architecture, digital shipbuilding systems, artificial intelligence, and industrial process optimization. These individuals support high-value functions including system design, advanced training, and modernization efforts.
- **J-1 Visa (Instructor Exchange and Training Programs)**
 Applied to structured exchange-based roles, including visiting instructors, trainers, and

trainees participating in institutional partnerships. This pathway is particularly effective for short-term instructional support, knowledge exchange, and collaborative training initiatives with allied institutions.

- **H-2B Visa (Selective Skilled Trade Support)**

Utilized, where appropriate, for certain non-degree skilled trade roles that fall outside traditional H-1B eligibility. This pathway can support short-term or seasonal labor needs in specific trade categories, subject to regulatory limitations and workforce availability requirements.

- **EB-2 National Interest Waiver (Long-Term Retention of Critical Talent)**

Provides a pathway for retaining select high-impact individuals whose contributions are aligned with national workforce and industrial priorities. This supports continuity in specialized roles where long-term expertise is essential.

This multi-pathway visa strategy allows the Shipbuild Talent Hub to match the right type of talent to the right role, while maintaining compliance with U.S. regulations and adapting to evolving policy conditions. It ensures that workforce deployment remains targeted, controlled, and aligned with national shipbuilding priorities, while reinforcing the development of a strong and sustainable domestic workforce.

This approach enables SDI to operate as a visa-enabled talent deployment platform, capable of supporting both immediate workforce needs and long-term capability development across the U.S. shipbuilding ecosystem.

5. Pilot Program and Initial Deployment Strategy

To transition the Shipbuild Talent Hub (SAIL) from concept to execution, SDI plans to initiate a **multi-region pilot program** designed to validate workforce acceleration, global instructor integration, and digital enablement in real-world shipbuilding environments.

5.1. Pilot Structure

The initial deployment will follow a **dual-node model with a strategic partner node**, enabling both scale and regional specialization:

- **Primary Target Node 1: Hampton Roads, Virginia**

Focus: Naval shipbuilding, engineering roles, and alignment with U.S. Department of Defense priorities

- **Primary Target Node 2: Gulf Coast (Mississippi/Alabama)**

Focus: Scalable skilled trades workforce (welders, pipefitters, electricians) and production throughput

- **Strategic Partner Target Node: Philadelphia, Pennsylvania (Hanwha Philadelphia Shipyard)**
Focus: Commercial shipbuilding and international collaboration, including integration of allied shipbuilding expertise

5.2. Pilot Scope (18–24 Months)

The pilot will target the training and deployment of approximately:

- **300–400 workers**, including:
 - ~220 skilled trades personnel
 - ~40–60 engineers and technical specialists
 - ~20–30 instructors and subject matter experts

5.3. Training & Deployment Model

The pilot will integrate three coordinated components:

1. **Accelerated Domestic Workforce Programs**
 - Delivered through community colleges, technical schools, and maritime training institutions
 - 6–12 month fast-track programs aligned to shipyard requirements
2. **Instructor-Led Training Model (Allied Expertise Integration)**
 - Deployment of experienced instructors and technical experts from allied shipbuilding nations
 - Focus on training and upskilling U.S. workers rather than workforce substitution
3. **Apprenticeship and Direct Placement Pathways**
 - Embedded training within shipyard operations
 - Direct transition from training to employment

5.4. Objectives of the Pilot

The pilot is designed to demonstrate:

- Rapid workforce scaling within constrained timelines
- Improved training efficiency and reduced time-to-productivity
- Effective integration of allied expertise into domestic workforce development
- Measurable improvements in shipbuilding throughput and operational coordination

5.5. Scalability

Upon successful validation, the pilot model will be expanded into a **national, multi-region Shipbuild Talent Hub network**, incorporating additional shipbuilding regions and training partners.

6. Governance and Operating Model

The successful execution of the Shipbuild Talent Hub depends on clear coordination across industry, government, and training institutions. The initiative is designed to operate as a structured yet flexible system, where responsibilities are clearly defined while allowing each region to adapt to local conditions. At the center of this model is a coordinating function that ensures alignment across all participating stakeholders, maintains performance accountability, and supports the scaling of the initiative beyond the initial pilot.

This governance approach reflects a Quad Helix model of collaboration, where industry, government, academia, and the workforce itself operate as interconnected drivers of capability. In the context of the Shipbuild Talent Hub, this means that workforce development is not treated as a downstream outcome, but as an active and integrated component of the system.

6.1. Central Coordination

SDI will serve as the coordinating platform for talent recruitment and deployment within the Shipbuild Talent Hub. Its role is not to replace existing institutions, but to integrate and align their efforts into a cohesive system. This coordinating function includes:

- Aligning workforce demand from industry with training capacity from academic partners
- Facilitating the deployment of instructors and technical experts, including those from allied nations
- Supporting the integration of digital tools through the deployment of specialized expertise or Subject Matter Experts (SMEs)
- Establishing performance benchmarks and tracking outcomes across all pilot regions

This structure allows the initiative to operate with a single strategic direction while drawing on the strengths of multiple partners.

6.2. Regional Execution Nodes

Each pilot location will function as a regional execution node, responsible for delivering workforce outcomes within its specific operating environment. Regional nodes will:

- Implement training programs through local institutions

- Coordinate directly with shipyards and employers on hiring needs
- Integrate apprenticeship and onsite training pathways
- Adapt program delivery to regional workforce conditions

This approach ensures that execution remains grounded in local realities while staying aligned with national objectives. These commitments are critical to ensuring that workforce development remains directly tied to production outcomes and does not operate in isolation from industry needs.

6.3. Industry Participation

Shipbuilders and related industry partners play a central role in defining demand and ensuring that training aligns with real production needs.

Participating industry partners will:

- Define role requirements and workforce standards
- Commit to hiring targets linked to the pilot program
- Provide access to facilities for apprenticeship and onsite training
- Offer feedback on workforce readiness and performance

This direct involvement ensures that training outcomes translate into immediate employment and productivity gains.

6.4. Government Enablement

Federal and state partners will support the initiative through policy alignment, funding mechanisms, and workforce development programs.

Government participation may include:

- Support for workforce training through existing federal and state programs
- Alignment with national priorities related to maritime capacity and industrial resilience
- Consideration of targeted pathways that enable the use of allied instructors and specialized expertise where appropriate

This role is essential in creating the conditions that allow the initiative to scale effectively.

6.5. Academic and Training Partners

Educational institutions and training providers will serve as the primary delivery mechanism for workforce development. These partners will:

- Deliver accelerated, industry aligned training programs
- Incorporate instructor support from both domestic and allied experts
- Provide credentialing that reflects real world skill requirements

- Maintain close coordination with industry partners to ensure relevance

Their role ensures that the supply of talent remains responsive to changing industry needs. Through this role, training institutions serve as the primary interface between industry demand and workforce participation, ensuring that individuals entering the shipbuilding sector are fully integrated into a coordinated national effort.

6.6. Advisory and Oversight Structure

An advisory group composed of representatives from industry, government, and academia will provide strategic guidance and oversight. This group will:

- Review performance outcomes and recommend adjustments
- Ensure alignment with national and regional priorities
- Support the identification of opportunities for expansion

This layer adds accountability while maintaining flexibility in execution.

6.7. Workforce as a Core System Component

The Shipbuild Talent Hub recognizes the workforce not simply as a beneficiary of training programs, but as an active participant in the system. Workers entering and progressing through the program contribute to continuous feedback on training effectiveness, operational challenges, and skill requirements. This approach strengthens workforce ownership and contributes to long term retention, skills progression, and system resilience.

This feedback loop allows the system to adapt in real time, improving both training delivery and workplace integration. It also reinforces the long term objective of building a resilient and sustainable shipbuilding workforce in the United States.

6.8. Scalability and Replication

The governance model is designed to support expansion beyond the initial pilot. As additional regions join the Shipbuild Talent Hub, the same structure can be replicated while allowing for regional customization. This balance between centralized coordination and localized execution enables the initiative to grow without losing coherence or effectiveness.

7. Stakeholders and Call to Action

While the SAIL Framework provides a comprehensive model for revitalizing U.S. shipbuilding, its success depends on clearly defined commitments and coordinated execution across all stakeholders. This initiative is designed to move beyond alignment in

principle and toward measurable action, where each participant contributes directly to workforce development, industrial capacity, and long term maritime resilience. No single entity can achieve this outcome alone. Progress requires synchronized participation from government, industry, academia, technology partners, and allied collaborators, each operating within a shared framework and accountable to defined outcomes.

The following table identifies the primary stakeholder groups, their roles within this framework, and the specific actions or outcomes expected from them. Together, these coordinated actions form the operational foundation for implementing the objectives of the SHIPS for America Act and the April 9, 2025, Executive Order on Restoring America’s Maritime Dominance.

7.1. Stakeholder Mapping and Call to Action Matrix

Stakeholder Group	Role / Influence	Expected Actions or Outcomes
Smart Development Institute	SMART Enabler	<ul style="list-style-type: none"> • Implement the Shipbuild Talent Hub initiative through the recruitment and deployment of qualified instructors and skilled personnel, supporting workforce development and workforce augmentation, utilizing appropriate and compliant working visa pathways. • Coordinate with industry, government, and training partners to align talent deployment with workforce needs, support training delivery, and ensure effective integration of allied expertise into U.S. shipbuilding operations.
Federal Policymakers and Legislative Stakeholders (U.S. Congress, MARAD, DOT, DoD, White House OSTP)	Authorize funding and oversee policies and program alignment.	<ul style="list-style-type: none"> • Enact and fund the <i>SHIPS for America Act</i>. • Provide policy alignment, funding support, and program authorization necessary to enable workforce development, and industrial modernization. • Enable targeted working visa pathways, supported by appropriate policy adjustments, to facilitate the timely participation of allied instructors and specialized experts in workforce development and training programs aligned with national shipbuilding priorities.
U.S. Navy, DoD, and Defense Industrial Base (NAVSEA, PEO Ships, PEO Submarines, OUSD Industrial Policy)	Implement modernization programs and sustainment initiatives.	<ul style="list-style-type: none"> • Prioritize domestic shipyard utilization and modernization. • Incorporate Privatized AI Ecosystems for digital shipbuilding and performance management.

Stakeholder Group	Role / Influence	Expected Actions or Outcomes
		<ul style="list-style-type: none"> Strengthen supplier engagement and transparency across the value chain.
Shipbuilding Industry and Private Sector Partners (Major shipyards, suppliers, and trade associations)	Operate, innovate, and expand industrial capacity.	<ul style="list-style-type: none"> Commit to defined hiring targets aligned shipbuilding revitalization initiatives and Invest in workforce upskilling and digital infrastructure. Provide access to facilities for training and apprenticeship integration, and actively participate in shaping workforce requirements, training standards, and performance feedback loops. Establish apprenticeships and mentorship programs in collaboration with local institutions.
Workforce Development and Education Ecosystem (Community colleges, maritime academies, trade schools, DOL)	Build the skilled labor pipeline and sustain training capacity.	<ul style="list-style-type: none"> Deliver accelerated and industry-aligned training programs, expand instructional capacity, and ensure that workforce output meets defined hiring requirements, technical standards, and evolving shipbuilding needs.
AI and Technology Ecosystem (Systems integrators, AI developers, cybersecurity firms)	Provide digital transformation capabilities and ensure data security.	<ul style="list-style-type: none"> Deploy secure, behind-the-firewall Privatized AI systems for shipyards. Develop interoperable tools for workforce planning, predictive maintenance, and knowledge management. Support shipyards in achieving compliance with defense-grade cybersecurity standards.
International Allied Partners (South Korea, Japan, Philippines, and Australia – maritime education, training, and defense-aligned institutions)	Support workforce development through training exchange and cooperation.	<ul style="list-style-type: none"> Support instructor exchange, advanced training collaboration, and targeted knowledge transfer in alignment with U.S. workforce development objectives, ensuring that all participation strengthens domestic capability within secure and coordinated frameworks.

7.2. Unified Call to Action

The path to revitalizing America’s shipbuilding capacity requires immediate and coordinated action. The Shipbuild Talent Hub provides a clear and executable framework, but its success depends on stakeholders moving from alignment to commitment.

Congress must prioritize funding and policy alignment that supports workforce development and industrial capacity. **Defense and maritime agencies must** synchronize workforce initiatives with production requirements. **Shipbuilders must** commit to hiring, training integration, and

operational participation. **Educational institutions must** accelerate workforce delivery aligned with real industry demand. **Technology partners must** enable secure and effective digital systems that enhance productivity. **Allied partners must** contribute expertise in a targeted and structured manner that strengthens domestic capability.

This initiative is designed to move quickly from pilot implementation to national scale. Stakeholders who engage early will play a defining role in shaping the future of America’s shipbuilding capacity and workforce.

8. Conclusion

The revitalization of America’s shipbuilding industry depends on more than new technology or expanded training. It requires a **united national effort anchored in collaboration among all key stakeholders**: government, industry, education, technology, and international partners. The **four pillars of the SAIL Framework** presented in this white paper: **Workforce Development, Workforce Augmentation, Digital Modernization, and Communication and Outreach**, form a single framework for rebuilding capacity, strengthening instruction, modernizing production, and inspiring public commitment. Together, they promote and sustain a **Quad Helix model** that unites government, industry, academia, and the public in a common mission to restore maritime strength and national pride. **Success will depend on disciplined execution, measurable outcomes, and transparent coordination among every participant in the shipbuilding ecosystem.**

These strategies directly advance the goals set forth in the **Ships for America Act** and the **April 9 Executive Order on Restoring America’s Maritime Dominance**. Both initiatives call for a revitalized industrial base, a stronger maritime workforce, and modernized shipyard capacity that can meet the growing needs of the Navy and the nation. **The four pillars outlined in this paper provide the structure to achieve those mandates** by building a skilled labor pipeline, accelerating the adoption of secure digital technologies, and uniting public and private stakeholders around a shared vision of maritime revitalization.

Through this integrated approach, the United States can overcome the challenges that have long constrained its shipbuilding capacity and reclaim its position as a global leader in maritime innovation. *What begins as a plan to rebuild shipyards ultimately becomes a movement to strengthen the economy, restore industrial confidence, and secure the nation’s future at sea.* **Revitalizing America’s shipbuilding industry is not only an economic imperative—it is a reaffirmation of national resolve, technological leadership, and maritime pride.**

Appendix A: Reference Validation Summary Sheet

Document Title: *Forging the Future Fleet: The SAIL Framework for U.S. Shipbuilding Workforce and Infrastructure Revitalization*

Date Verified: March 2026

#	Reference Title / Source	Organization / Publisher	URL	Status	Source Type
1	<i>H.R.3151 – SHIPS for America Act of 2025</i>	U.S. Congress	congress.gov/bill/119th-congress/house-bill/3151/text/ih	✔ Active	Legislative Document
2	<i>Executive Order: Restoring America’s Maritime Dominance</i>	The White House	whitehouse.gov/presidential-actions/2025/04/restoring-americas-maritime-dominance	✔ Active	Executive Order
3	<i>U.S. Navy Shipbuilding Is Consistently Over Budget and Delayed...</i>	U.S. Government Accountability Office (GAO)	gao.gov/blog/u.s.-navy-shipbuilding-consistently-over-budget-and-delayed	✔ Active	Federal Report Summary
4	<i>The Shipyard Shortage Is a People Problem</i>	U.S. Naval Institute	usni.org/magazines/proceedings/2024/september/shipyard-shortage-people-problem	✔ Active	Industry Journal
5	<i>Charting a New Course: The Untapped Potential of American Shipyards</i>	McKinsey & Company	mckinsey.com/industries/aerospace-and-defense/our-insights/charting-a-new-course	✔ Active	Industry Analysis
6	<i>Welding Workforce Data Portal</i>	American Welding Society	weldingworkforcedata.com	✔ Active	Workforce Database
7	<i>GAO Report GAO-25-106286: Navy Needs a Strategic Approach for Private Sector Industrial Base Investments</i>	U.S. GAO	gao.gov/assets/gao-25-106286.pdf	✔ Active	Federal Report (PDF)
8	<i>NDIA and Navy TPP Team Up to Grow Next-Gen Shipyard Talent</i>	National Defense Industrial Association (NDIA)	ndia.org/about/press/press-releases/2025/4/30/talent-pipeline-program	✔ Active	Industry Press Release
9	<i>Research and Education for Maritime Progress</i>	National Academies of Sciences,	nap.nationalacademies.org/catalog/20405	✔ Active	Research Report

#	Reference Title / Source	Organization / Publisher	URL	Status	Source Type
		Engineering, and Medicine			
10	<i>Shipbuilding Market Size, Share & COVID-19 Impact Analysis</i>	Fortune Business Insights	fortunebusinessinsights.com/shipbuilding-market-103351	Active	Market Analysis
11	<i>GAO-25-106286 Product Page</i>	U.S. GAO	gao.gov/products/gao-25-106286	Active	Federal Product Record
12	<i>Waypoints and Course Adjustments: Naval Shipbuilding Cooperation with South Korea</i>	Stimson Center	stimson.org/2025/waypoints-and-course-adjustments	Active	Policy Research Report
13	<i>Japan Firms Face Serious Labour Crunch as Aging Population Bites</i>	Reuters	reuters.com/sustainability/sustainable-finance-reporting/japan-firms-face-serious-labour-crunch	Active	News Article
14	<i>Maritime Education in the Philippines: Nurturing the World's Seafarers</i>	Institute of Developing Economies – JETRO	ide.go.jp/library/English/Publish/Reports/Brc/pdf/re32_03.pdf	Active	Research Report (PDF)
15	<i>Fact Sheet: Implementation of the AUKUS Partnership</i>	Security & Defence PLuS	https://securityanddefenceplus.plusalliance.org/wp-content/uploads/2023/12/AUKUS-Briefing-Book-Joint-Statement-Fact-Sheet-Implementation-of-the-AUKUS-Partnership.pdf	Active	Research Report (PDF)
16	<i>2024 Naval Shipbuilding and Sustainment Plan</i>	Australian Government, Department of Defence	https://www.defence.gov.au/about/strategic-planning/2024-naval-shipbuilding-sustainment-plan	Active	Government Report Summary
17	<i>About TAFE and Vocational Education System</i>	TAFE Directors Australia	https://www.tda.edu.au	Active	Industry Institute Website

#	Reference Title / Source	Organization / Publisher	URL	Status	Source Type
18	<i>Australian Maritime College Overview</i>	University of Tasmania	https://www.utas.edu.au/amc	Active	Industry Analysis
19	<i>Defence Industry Development Strategy</i>	Australian Government, Department of Defence	https://www.defence.gov.au/about/strategic-planning/defence-industry-development-strategy	Active	Government Report Summary
20	<i>Australia–United States Alliance Overview</i>	Australian Government, Department of Foreign Affairs and Trade	https://www.dfat.gov.au/geo/united-states-of-america	Active	Government Report Summary
21	<i>Congressional Guidance for a National Maritime Strategy – Reversing the Decline of America’s Maritime Power</i>	U.S. Senate (Sen. Kelly’s Office)	kelly.senate.gov/wp-content/uploads/2024/05/Congressional-Guidance-for-a-National-Maritime-Strategy.pdf	Active	Legislative Guidance Document
22	<i>U.S. Maritime and Shipbuilding Industries: Strategies to Improve Regulation, Economic Opportunities, and Competitiveness</i>	U.S. Department of Transportation	transportation.gov/testimony/us-maritime-and-shipbuilding-industries-strategies-improve-regulation-economic	Active	Federal Testimony