



White Paper

Naval Dominance Restored

How C5MI's Live Warehouse® and Real-Time Location Systems (RTLS) Technologies Are Transforming U.S. Naval Shipbuilding Operations

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Executive Summary

The U.S. Navy is facing a strategic inflection point. The April 2025 Executive Order "Restoring America's Maritime Dominance" has made it clear that the current state of naval shipbuilding is no longer sustainable. With China producing nearly half of the world's commercial ships and fielding a navy larger than the United States', the urgency to modernize is not just operational—it is existential. The Navy must adopt transformative technologies that address systemic inefficiencies and restore its ability to build and sustain a modern fleet at scale and speed.

C5MI's Live Warehouse® platform, developed in partnership with KINEXON and SAP, offers a proven solution. This integrated system creates a real-time digital twin of shipyard operations, enabling predictive analytics, automated workflows, and full traceability of materials and personnel. It replaces outdated manual processes with intelligent automation, giving shipyards the visibility and control they need to operate with precision, agility, and accountability. The platform is already delivering measurable results in cost, schedule, workforce productivity, and supply chain resilience across complex industrial environments.

This white paper outlines the four most pressing challenges facing the Navy's shipbuilding enterprise and demonstrates how the Live Warehouse® platform directly addresses each one. It presents a crystal clear, data-driven case for action, supported by real-world results and a six-month return on investment. The Navy has the mandate. The technology exists. The opportunity to lead a new era of shipbuilding excellence is within reach—and the time to act is now.



Naval Shipbuilding Challenges

A series of deeply rooted challenges undermines the Navy's ability to build and sustain a modern fleet. These issues are not isolated—they are systemic and interdependent. They affect every aspect of the shipbuilding enterprise, from procurement and production to maintenance and readiness. Without quick intervention, these challenges will continue to erode the Navy's operational effectiveness and strategic advantage in a rapidly evolving global maritime landscape.

This section outlines the four most critical areas where the Navy is experiencing breakdowns. Each represents a significant barrier to achieving the goals outlined in the Maritime Action Plan. Together, they form a clear picture of why transformation is not just necessary—it is urgent and unavoidable.



Cost and Schedule Instability

- **Budget Overruns:** Over 80% of Navy ships exceed budget, often by 100% or more.
- **Delivery Delays:** Every recent lead ship has been delivered years behind schedule.
- **Material Disruptions:** Poor inventory accuracy and delivery delays disrupt production timelines.



Maintenance Backlogs

- **Budget Repair Delays:** Only 36% of surface ship repairs finish on time.
- **Contractor Overruns:** Private yards take nearly 10,000 days longer than initially planned to repair destroyers, compounding delays across the fleet.
- **Capacity Shortfalls:** Maintenance delays equate to losing half a carrier and three submarines annually, reducing operational availability.



Workforce Limitations

- **Budget Skilled Labor Shortage:** Welders, pipefitters, and naval architects are in short supply.
- **Training Gaps:** Programs are outdated and disconnected from operational needs.
- **Safety Risks:** Inefficient task assignments and outdated protocols increase incidents.



Supply Chain Vulnerabilities

- **Budget Global Dependencies:** COVID-19 exposed critical reliance on overseas suppliers.
- **Inventory Inaccuracy:** Material shortages and outdated records delay production.
- **Vendor Blind Spots:** Lack of performance data increases risk and reduces accountability.

Driving Naval Readiness

C5MI's Live Warehouse® platform transforms how organizations manage complex operations, including those of the U.S. Navy. The solution enhances fleet construction, repair, and sustainment by creating a real-time digital twin of shipyard operations. This solution enables predictive analytics, automates workflows, and ensures full traceability of materials and personnel. Replacing outdated manual processes, it delivers intelligent automation and gives shipyards the visibility and control to operate with precision, speed, and resilience.

This section highlights four key ways the Live Warehouse® platform actively drives naval readiness. Each capability directly addresses the Navy's most urgent needs and delivers impactful and measurable improvements in performance, resilience, and return on investment. These benefits aren't theoretical—they reflect proven outcomes from real-world deployments in complex industrial environments.



1. Real-Time Operational Visibility

The Navy can only manage what it can see. Visibility forms the foundation of control. Live Warehouse® delivers that visibility at scale, right where it matters most.

- **Real Time Training:** The system tracks every component, tool, and worker with sub-meter accuracy.
- **Unify Data:** It integrates all operational data into a single digital twin, accessible from anywhere.
- **Instant Alerts:** It flags escalations and exceptions immediately, cutting down on downtime.

This level of visibility removes guesswork and empowers proactive management. It keeps materials precisely where they're needed and ensures teams complete tasks on time, with full accountability.

2. Intelligent Automation of Logistics and Maintenance

Manual processes are slow, error-prone, and costly. Automation is essential for speed, accuracy, and consistency. Live Warehouse® integrates AI-driven forecasting, automated replenishment, and digital quality enforcement into a single, seamless system. This automation system will benefit the Navy by:

- ✓ **Predicting Failures Before They Occur**
- ✓ **Automatically Restocking Inventory**
- ✓ **Enforcing Quality at Every Stop**
- ✓ **Reducing Delays and Manual Errors**

3. Workforce Enablement and Safety

People are the Navy's greatest asset. They need tools that match the complexity of their mission. Live Warehouse® equips the workforce with mobile-enabled tools, real-time training, and intelligent task assignment to improve productivity and reduce risk.

- **Mobile Instructions:** Workers receive real-time guidance on handheld devices, reducing errors and rework while improving task clarity.
- **Skill-Based Tasking:** Assignments are matched to certifications and experience, optimizing labor utilization and reducing idle time.
- **Safety Monitoring:** Collision avoidance and emergency alerts reduce incidents and improve response times across all operational zones.

This digital enablement improves productivity, reduces onboarding time, and enhances morale. It also builds a culture of accountability and continuous improvement, ensuring that every worker is empowered to perform at their best and contribute to mission success.

4. Strategic Technology Integration

The strength of this solution lies in its ecosystem. C5MI has partnered with two of the most trusted names in industrial technology to deliver a platform that meets the Navy's unique needs. These partnerships ensure that the solution is not only robust but also scalable, secure, and aligned with the Navy's long-term modernization goals in a variety of ways.

- ✓ **Precision Tracking With KINEXON RTLS**
- ✓ **Key Inventory Control With SAP EWM**
- ✓ **Unified Systems With C5MI Live Warehouse®**
- ✓ **Built to Scale With Phased Deployments**

Key Results

	Target Outcome	Annual Value
Project Schedule	90% on-time delivery (vs. current 36%)	\$2.3B in savings
Cost Overruns	25% reduction across shipbuilding programs	\$1.8B in savings
Maintenance Completion	50% faster turnaround	\$1.2B in savings
Fleet Readiness	1,000+ additional operational ship days annually	Equivalent to 3–4 ships
ROI	6-month payback period	\$45B+ NPV over 10 years

A Call to Action

The Navy has a clear mandate to modernize. The Executive Order *Restoring America's Maritime Dominance* outlines the urgency, but the path forward requires more than policy—it requires execution. C5MI's Live Warehouse® platform, developed in partnership with KINEXON and SAP, provides the operational foundation to meet this moment. It is a tested, scalable solution that delivers real-time visibility, predictive analytics, and intelligent automation across the shipbuilding enterprise.

This platform directly addresses the Navy's most pressing challenges. It reduces cost overruns, accelerates maintenance, empowers the workforce, and strengthens the supply chain. It integrates seamlessly with existing systems and scales across facilities. It is built on commercial best practices and tailored for military precision. The Live Warehouse® platform is not a concept—it is a proven system with a clear roadmap and a six-month return on investment. It is already delivering results in complex industrial environments and is ready to do the same for the Navy.

The opportunity is here. Begin with a pilot. Scale across shipyards. Integrate with existing infrastructure. Empower the workforce with real-time tools. Optimize logistics and maintenance. Restore readiness and resilience. The future of American maritime dominance depends on decisive action, and the technology to achieve it is ready now. C5MI stands prepared to lead this transformation with the Navy, delivering the key operational excellence required to meet today's mission and tomorrow's challenges.



About the Author



Marty Groover is the Senior Technical Fellow for Industry 4.0 at C5MI. With over two decades of experience as a surface warfare officer in the U.S. Navy, he is a recognized thought leader in production planning, lean manufacturing, and ERP systems. In his role, Marty effectively leads functional and technical teams to solve complex manufacturing challenges by merging people, processes, and technology. His extensive background includes serving as an Operational Technology Manager at Caterpillar, where he honed his skills in integrating advanced technologies into manufacturing processes.

Marty is the author of *Speed of Advance*, where he shares insights on leveraging technology to excel in the Fourth Industrial Revolution. His commonsense approach to converging people, processes, and technology is the bedrock for success in today's rapidly evolving marketplace. As a partner in the Industry 4.0 practice at C5MI, Marty collaborates with clients to develop strategies that leverage new technologies to gain a competitive edge. His contributions have significantly impacted the way organizations approach operational efficiency and innovation.



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