

White Paper

PARADIGM SHIFT:

Elevating Maritime Equipment Standards to
Enhance Operator Survival





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As global powers such as the US Department of Defense (DoD) and NATO pour vast resources into cutting-edge technologies like artificial intelligence (AI), machine learning, unmanned surface vehicles (USVs), unmanned underwater vehicles (UUVs), and unmanned aerial vehicles (UAVs), a glaring vulnerability has emerged. The focus on technology has led to a significant underinvestment in human capital—specifically, in the training and equipment that our military personnel rely on to survive and succeed in combat. This oversight is not just a budgetary issue but a cultural and programmatic misconception that could result in catastrophic mission failures when conflict inevitably reaches our shores. No matter what shape the next global conflict takes, it will be humans, not machines, who are ultimately committed to the battlefield.

The Realities of the Maritime Environment

The maritime environment is among the most hostile and unforgiving on Earth. Hypothermic conditions, sheer cliffs, powerful surf zones, and rapidly changing weather patterns are just a few of the challenges that maritime operators face daily. Unlike technology, humans cannot be hacked, do not run on batteries, and are inherently water-resistant, and while technology operates within the parameters it was designed for, it lacks the adaptability and resilience that comes with human experience and training. However, despite these inherent strengths, our maritime operators are consistently neglected in comparison to their airborne counterparts when it comes to life-saving equipment.



Photo by Chief Mass Communication Specialist Mike DiMestico copyright of the United States Navy.



Memorial service at Marine Corps Base Camp Pendleton on Aug. 21, 2020 in remembrance of the eight Marines and one sailor from Bravo Company, BLT 1/4, 15th MEU, who died in an assault amphibious vehicle mishap off the coast of California, July 30, 2020. (U.S. Marine Corps/Cpl. Dalton S. Swanbeck)

Several factors contribute to this disparity:

Cultural Attitudes: There is a pervasive belief among maritime operators that being a strong swimmer negates the need for additional safety equipment. This mindset is dangerously flawed and overlooks the unpredictability of in-water situations, whether in training or combat scenarios. In reality, survival equipment is a critical safeguard against the unexpected challenges that even the strongest swimmers may encounter during these high-stakes operations. This shift in perspective redefines survival gear as essential for allowing operators to perform at their peak, even in the harshest environments, ensuring they remain focused on the mission and confident in their ability to survive unexpected challenges.

Military organisations have shown a willingness to invest heavily in high-value technologies such as drones, artificial intelligence (AI), and unmanned aerial vehicles (UAVs), all designed to enhance strategic capabilities. However, equipment like thermal protection garments, immersion suits, and tactical lifejackets are often overlooked despite being low-cost, high-impact investments. These essential pieces of gear are not merely for survival but are mission-enhancing tools that ensure the safety and effectiveness of the greatest asset any military can have—its people. Prioritising such equipment can significantly boost operator survivability and ensure mission success in extreme maritime conditions.

Budgetary Constraints: Mission support gear for maritime operators often takes a backseat in military budgets, with funding frequently delayed by continuing resolutions. This neglect is concerning given the high stakes involved in these operations. Maritime operators are frequently tasked with missions that involve extreme risks, such as amphibious assaults, coastal reconnaissance, and underwater demolition—all of which require navigating unpredictable and hostile environments. These high-stakes operations demand not only exceptional skill and physical endurance but also reliable and effective survival gear. An investigation into a tragic incident involving a Marine Corps amphibious vehicle highlighted how inadequate training and a lack of proper safety measures led to the preventable loss of lives, underscoring the severe consequences of underinvestment in essential safety equipment (Military.com, 2022).

Lack of Certification and Maintenance: While fighter pilots benefit from rigorous certification processes and a robust ecosystem dedicated to their survival, maritime operators receive proportionally less support. This creates a paradoxical situation: those in the military who are most likely to face the risk of drowning—such as maritime operators—are often the least prepared to survive it. The assumption that these operators will naturally cope with water environments overlooks the critical need for specialised training and reliable equipment. Recent data and investigations, such as the drowning of Staff Sgt. Paul Lincoln Olmstead during a combat diver course, have shown that inadequate life-saving equipment—like outdated military dive vests that require manual activation—contributes significantly to these tragic outcomes (Military Times, 2022).

Additionally, in many advanced militaries, survival gear is often developed and tested in isolation rather than as part of an integrated system. This fragmented approach to equipment design means the overall performance of the kit, when used together in real-world conditions, is not fully understood or certified. For example, life vests, immersion suits, and thermal protection garments may individually meet certain standards, but their collective performance may not be assessed, leaving gaps in operator protection. Without a system-level approach to the design, testing, and certification of this equipment, it's difficult to ensure that all components work seamlessly together to provide optimal protection and survivability.

A shift towards viewing and certifying gear as part of a comprehensive system, rather than individual components, is essential to improving operator safety and mission success.



Image Source: Business Insider, November 2023

Furthermore, drowning remains a leading cause of death during military training exercises, especially in environments where cold water and overexertion are factors.

Military Medicine, 2023

A Call to Action: Equal Standards for Survival

Recognising the high standards in place to protect pilots during in-water survival scenarios, it is essential that the same level of stringent requirements, integrated system testing, and robust support systems be extended to our maritime operators. While the risks they face differ, the importance of their safety is the same. We call for the immediate implementation of the following actions:

Mandate System-Level Certification

Maritime survival gear must be designed, tested, and certified as an integrated system rather than isolated components. This will ensure that equipment such as life vests, immersion suits, and thermal protection garments work seamlessly together to offer optimal protection in real-world conditions.

Establish Comprehensive Training Requirements:

Just as pilots undergo regular and rigorous water survival training, maritime operators must receive mandatory, comprehensive water survival training. This training should be updated regularly to reflect evolving threats and operational environments.

Implement Routine Maintenance and Equipment Upgrade

A strict schedule for the maintenance and inspection of maritime survival gear must be enforced to ensure all equipment is in optimal condition. Additionally, a clear timeline should be established for transitioning from outdated, legacy gear to advanced, high-performance equipment.

Allocate Adequate Budgetary Support

Maritime safety equipment must be prioritised within military budgets. The funding allocated to procure and maintain life-saving gear must be reflective of the high-risk environments maritime operators face.

By taking these steps, we can ensure that maritime operators are equipped with the best possible survival gear and training, enabling them to survive and succeed in the unpredictable and challenging environments in which they operate. It's not just about equipment—it's about safeguarding the lives of our most valuable military asset: our people.



Elevating Standards to Save Lives: Recommendations for Enhanced Maritime Safety

To ensure the safety and effectiveness of our maritime operators, several key measures must be implemented:

1

Adopt a Systems Approach to Development, Testing, and Qualification (Same as Pilots)

A holistic, systems-based approach must be applied to the design, testing, and certification of maritime survival gear, similar to the stringent processes used for pilots' equipment. Rather than testing individual components in isolation, survival equipment—such as life vests, immersion suits, and communication devices—should be tested as part of an integrated system. This approach ensures that all gear works seamlessly together, maximising the protection and effectiveness of maritime operators in real-world conditions. It will also allow for any potential shortcomings in gear compatibility to be identified and addressed before deployment.

3

Embrace New Technologies that Offer a Step Change in Capability

New technologies, such as advanced materials, wearable sensors, and enhanced buoyancy systems, present an opportunity to significantly improve maritime operator safety and performance. Embracing these innovations will result in a step change in capability, allowing operators to perform more effectively in extreme environments. For instance, the use of smart fabrics that regulate body temperature or gear equipped with real-time biometric monitoring can enhance the endurance and readiness of operators during extended missions. The military must stay at the forefront of these technological advancements, ensuring that new developments are rapidly integrated into the field.

2

Develop Systems that Enhance Both Mission Capability and Survivability

Equipment should not only protect operators but also enhance their mission capabilities. This requires designing survival gear that complements the physical demands of maritime operations, providing resilience in the harshest conditions without compromising operator mobility or effectiveness. Whether it's thermal protection that enables operators to withstand cold water for longer durations or advanced lifejackets that integrate with tactical gear, the focus must be on gear that enhances survivability while also contributing to mission success.

4

Define Performance Standards and Set a Timeline to Transition from Legacy Equipment

It is critical to establish clear performance standards that all survival gear must meet, ensuring consistency in quality and effectiveness across all units. Alongside these standards, a defined timeline for phasing out outdated, legacy equipment and transitioning to modern, high-performance alternatives must be enforced. Legacy gear that no longer meets today's operational demands or technological advancements presents a risk to operator safety. By setting firm deadlines and implementing a structured rollout of new equipment, the military can ensure that operators are always equipped with the best tools for the mission at hand.

These recommendations are not mere enhancements; they are essential actions to prevent future drownings and to secure the success of missions that involve waterborne operations.

Investing in the right survival equipment and training for maritime operators is not solely a matter of saving lives—it is also a strategic imperative that enhances the overall effectiveness of our military forces. Properly equipped and trained personnel can operate with greater confidence and focus on the mission, knowing that their safety is prioritised. This not only increases their operational effectiveness but also reduces distractions, allowing them to concentrate fully on achieving their mission objectives.

As we continue to advance and integrate new technologies, we must remember that it is ultimately people who fight and win wars. By prioritising the safety and preparedness of our maritime operators, we strengthen our military capabilities across all domains—land, sea, and air.

In conclusion, the next paradigm shift in military preparedness must include a renewed focus on human capital, particularly for those operating in maritime environments. It is imperative that we provide our operators with the support and resources they need to survive and succeed. The future success and resilience of our military depend on it.

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