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Navigating the impossible

Integrating Kobayashi Maru-style exercises into the simulator-based training of deck officers

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In the Malacca Straits on the bridge of a container ship, a deck officer on watch faces a seemingly impossible choice. Bound for Singapore, and already behind schedule due to difficult weather conditions in the Indian Ocean, the radar isn't functioning at its most efficient due to smoke in the atmosphere from forest clearance activity ashore. To starboard at a range of one mile is a bulk carrier, steering a similar course and speed to their own, with which they have been in an overtaking situation for the last day. Another container ship, also bound for Singapore, is two miles astern. A ferry – crossing from the starboard side – is currently at a range of four miles and on course to collide. Directly ahead, out of the haze, emerges a cluster of fishing vessels. The radars aren't yet able to detect them, but they are at a distance of approximately five miles. To port is a rocky shoal surrounded for miles by patches of dangerously shallow water. And then the bilge alarm sounds for hold number one. The Master has instructed the watchkeeper that he does not wish to be disturbed as he has a mountain of paper work to get through before arrival in Singapore. What to do?

While this particular incident may appear to be simply a contrived fiction useful for making a point, it is a situation experienced, as a junior officer, by one of Liverpool John Moores University Maritime Centre's instructors. And it echoes countless real-world situations where deck officers find themselves navigating treacherous waters, both literally and figuratively. In an era of increasing maritime traffic, unpredictable weather patterns and complex international regulations, the need for deck officers who are capable of making decisions under extreme pressure has never been greater.

Enter the 'Kobayashi Maru' – a training concept borrowed from the realm of science fiction that could revolutionise how we prepare officers for the challenges of the high seas. Originally conceived as a test of character for Star Trek's Starfleet cadets, the Kobayashi Maru scenario is one that presents trainees with an unwinnable situation, forcing them to grapple with the realities of the real world, the limits of regulations, and the weight of life-and-death decisions. The integration of a Kobayashi Maru-style approach into existing courses of simulator-based training could enhance the decision-making capabilities, leadership skills and mental resilience of merchant navy deck officers. By subjecting trainees to scenarios that defy conventional solutions, we may better equip them to face the unpredictable navigational challenges of the 21st century.

The evolution of deck officer training

The history of merchant navy training has evolved from apprenticeship models to formalised academies, to now include high-tech

simulator-based instruction. The introduction of simulator training in the 1970s marked a significant leap forward, allowing officers to gain critical experience in high risk situations without the risks associated with doing the same things at sea. A former instructor at Liverpool John Moores University's Maritime Academy, who had over 40 years' experience in the Merchant Navy, would often reflect on this evolution: 'When I started, you learned by doing, often in situations where mistakes could be costly. Simulators changed that, giving us a safe space to make and learn from our errors.' Today, simulator training is used to provide a mixture of navigation exercises, engine room simulations, and cargo handling scenarios. While undoubtedly valuable, these often focus on technical proficiency and adherence to standard procedures. However, as maritime incident reports consistently show, it's often the unconventional, high-pressure situations that pose the greatest challenges. The IMO reports that human error contributes to approximately 75% of maritime accidents. On top of that, a 2022 study by the European Maritime Safety Agency (EMSA) found that decision-making under stress was a critical factor in 43% of collisions and 38% of groundings.

These statistics underscore a crucial gap in current training methodologies. While officers may excel in routine operations, they can find themselves ill-prepared for scenarios that fall outside the bounds of traditional training. This is where the Kobayashi Maru approach could make a significant difference. 'We need to train not just for the expected, but for the unexpected,' argues Dr Abdul Khalique, Head of LJMU's Maritime Centre, 'It's in those moments of crisis, when there's no clear right answer, that we truly test the mettle of our officers.' The Kobayashi Maru concept could bridge the gap between traditional instruction and the complex realities of modern seafaring. By challenging officers to think beyond established protocols and to make difficult decisions in the face of impossible odds, we will be able to cultivate a new generation of maritime leaders who are better equipped to navigate the uncertainties of the world's oceans.

Testing character and decision-making

The Kobayashi Maru is not about winning or losing, but about revealing how individuals respond to no-win situations. In the context of merchant navy training, this approach can be adapted to test officers' ability to manage crises where conventional solutions are inadequate. At its core, the Kobayashi Maru approach challenges trainees to think creatively and ethically. It places them in scenarios that defy standard operating procedures, requiring them to weigh risks, prioritise safety, and make decisions with incomplete information. This type of training emphasises adaptability and resilience – qualities essential for effective leadership at sea. For merchant navy deck officers, a Kobayashi Maru-style scenario might involve a rapidly escalating situation where multiple systems fail simultaneously.

Imagine a simulation where a vessel loses propulsion in a busy shipping lane during a storm, with limited visibility and communication channels compromised. More senior officers may be incapacitated, leaving the watchkeeper unexpectedly 'in charge'. Such scenarios force officers to confront their own limitations and biases. They learn to rely on teamwork, draw on their experience, and

trust their instincts. By simulating these high-pressure environments, trainees can develop the confidence and competence needed to handle real-life emergencies. Experiences of this sort should be introduced as early as possible in the training of deck officers, rather than waiting until they are attending training for senior officer roles.

Designing scenarios

Creating effective Kobayashi Maru-style scenarios requires careful planning and a deep understanding of the unique challenges faced by deck officers. These scenarios must be grounded in realism, incorporating authentic conditions such as adverse weather, mechanical failures, and navigational hazards that officers might encounter at sea. They should also be complex, introducing multiple variables that demand prioritisation and strategic thinking, mirroring the multifaceted nature of real maritime crises. Crucially, these scenarios should also present ethical dilemmas that test an officer's moral decision-making capabilities.

The effectiveness of Kobayashi Maru-style training in maritime education hinges on the diversity and depth of simulated exercises. These exercises should encompass a wide spectrum of potential emergencies, from collisions and severe weather to security threats, ensuring officers are prepared for various challenges they might face at sea. By incorporating time pressure and evolving situations, these simulations test an officer's adaptability and quick thinking – crucial skills in real-world maritime crises. Communication challenges should be woven into scenarios, mimicking the difficulties often encountered in coordinating responses during emergencies at sea. Moreover, carefully crafted scenarios can serve to test officers' knowledge of international maritime laws and regulations, ensuring they can navigate complex legal waters as confidently as they do physical ones. Perhaps

most importantly, multi-stage scenarios allow for the evaluation of decisions over the long term, teaching officers to consider not just immediate consequences but also the ripple effects of their choices over time. This comprehensive approach to simulation design creates a robust training environment that prepares deck officers for the multifaceted challenges of modern seafaring, creating leaders who are not only technically proficient but also adaptable, communicative, and far-sighted in their decision-making.

The value of these scenarios lies in several key elements. First, realism is essential; by incorporating authentic maritime conditions and challenges, such scenarios prepare officers for situations they may actually encounter. This could involve common maritime emergencies, such as an engine room fire while transiting an ecologically sensitive area.

In addition to realism, complexity plays a significant role. The inclusion of multiple variables forces trainees to prioritise and think strategically, requiring them to balance various concerns simultaneously.

Another critical aspect is the ethical dimension of these scenarios. Introducing moral dilemmas adds depth to the training, preparing officers for the difficult decisions they may face at sea. This often involves forcing a choice between equally undesirable outcomes.

Such scenarios push officers beyond their comfort zones, requiring them to weigh multiple factors quickly and make tough calls. By facing these challenges in a simulated environment at an early stage in their training, officers can develop the critical thinking skills and moral fortitude necessary to handle similar situations in real life as they progress through their careers. Through careful design of these scenarios, training programmes can better prepare deck officers for the unpredictable and often unforgiving nature of life at sea.



Creating realism

Integrating students from diverse fields such as acting and paramedics into Kobayashi Maru-style training for merchant navy deck officers can significantly enhance the realism and effectiveness of these simulations. Actors can play the roles of distressed crew members, panicked passengers, or even hostile entities, adding a layer of emotional complexity to the scenarios. Their ability to portray authentic reactions and create high-pressure interpersonal situations can test officers' communication and leadership skills under stress. Paramedic students can contribute their expertise in emergency medical situations, simulating injuries and medical crises that officers might encounter at sea. This cross-disciplinary approach not only enriches the training experience for deck officers but also provides valuable interprofessional education opportunities. The collaborative environment encourages a more comprehensive understanding of crisis management, prompting deck officers to consider multiple perspectives when making decisions. Moreover, the inclusion of students from diverse backgrounds can help simulate the varied crew compositions often found on modern vessels, preparing officers for the cultural and professional diversity they will encounter in their careers. By creating these multifaceted, interdisciplinary scenarios, Kobayashi Maru-style training can more closely mirror the complex, unpredictable nature of real-world maritime emergencies.

The goal is not just to test technical knowledge but also to challenge deck officers to think critically, make decisions under pressure, and wrestle with ethical considerations. In doing so, this approach begins the development of skills that are crucial for real-world maritime leadership, cultivating leaders who can navigate both the physical and moral complexities of modern maritime operations. Ultimately, this training approach significantly enhances deck officers' preparedness for the complex challenges of modern seafaring.

Learning outcomes and assessment

The primary goal of Kobayashi Maru-style training is to cultivate officers who are not only technically proficient but also capable of leading under pressure. This approach yields several key learning outcomes. First and foremost, it enhances decision-making abilities, as trainees learn to evaluate options quickly and choose the best course of action in high-stakes situations. Secondly, it improves situational awareness, enabling officers to become adept at assessing rapidly changing environments and anticipating potential challenges. Furthermore, this training strengthens leadership skills, providing trainees with opportunities to practice coordinating with crew members and managing stress effectively. Perhaps most importantly, it builds resilience, allowing officers to develop mental toughness by navigating difficult scenarios without clear solutions.

Assessment of these exercises should focus on both individual performance and team dynamics. Assessors may employ various metrics to gauge trainee progress, such as decision speed, risk assessment accuracy, and communication effectiveness. Additionally, qualitative feedback from peers and instructors provides valuable insights into areas for improvement. This comprehensive evaluation approach ensures a well-rounded assessment of an officer's capabilities and potential for growth in real-world maritime leadership roles.

Challenges and considerations

Implementing Kobayashi Maru-style training poses several challenges. Some trainees may experience heightened stress levels during simulations, which could impact their performance negatively. It is essential to provide support mechanisms – such as counselling services or stress management workshops – to help trainees cope with these pressures. Additionally, developing high-quality simulations requires significant investment in technology and expertise. Training

centres must balance the costs of implementation with the potential benefits of producing more capable officers. Ethical considerations also arise when subjecting trainees to intense scenarios that mirror real-life disasters. It's crucial to ensure that simulations are conducted responsibly and that participants understand the purpose behind these exercises.

Debriefing sessions take on heightened significance in Kobayashi Maru-style training, compared to more traditional approaches. While debriefing is always valuable, the complex, high-stress, and ethically challenging nature of these no-win scenarios makes the post-exercise analysis crucial. In traditional training, debriefings often focus on technical skills and procedural adherence. However, Kobayashi Maru scenarios demand a more nuanced exploration of decision-making processes, emotional responses, and ethical reasoning. These debriefings provide a vital opportunity for trainees to reflect on their choices, confront their biases, and process the intense emotions often triggered by these scenarios. They allow instructors to guide discussions on the long-term implications of decisions, the balance between competing priorities, and the navigation of ethical grey areas. Moreover, group debriefings can encourage peer learning, as trainees share diverse perspectives on handling the scenario. This deep, reflective process is essential for developing the critical thinking skills, emotional resilience, and ethical decision-making capabilities that are the core objectives of Kobayashi Maru-style training. Ultimately, these enhanced debriefing sessions bridge the gap between simulation and real-world application, ensuring that the lessons learned are thoroughly internalised and transferable to actual high-stakes situations.

Lessons from other industries

The concept of training for no-win scenarios is not unique to maritime operations. It has been successfully applied in other high-stakes fields like aviation and military training. In aviation, pilots undergo rigorous simulator sessions that replicate previously experienced real-life emergency situations such as multiple engine failures, severe turbulence, or hijacking. These exercises teach pilots how to remain calm under pressure and make split-second decisions that prioritise passenger safety. Similarly, military personnel participate in war games designed to simulate battlefield conditions where traditional tactics may not apply. These exercises encourage soldiers to think creatively and adapt quickly when faced with unexpected challenges. By examining case studies from other fields, maritime trainers can gain valuable insights into best practices for implementing Kobayashi Maru-style scenarios effectively within their own training courses.

Building resilience

As global maritime operations become increasingly complex, and as new challenges emerge, the need for innovative approaches to deck officer training is clear. Integrating a Kobayashi Maru-style approach into simulator-based instruction offers an opportunity to prepare officers for the unpredictable realities they will encounter at sea. By challenging trainees with no-win scenarios that test character as well as competence, we can cultivate leaders who are not only skilled navigators but also resilient decision-makers capable of guiding their crews safely through any situation they may face. In embracing this innovative approach, we honour the countless deck officers who navigate impossible choices every day on our world's oceans. And we aim to equip the next generation with all they need to succeed – not just knowledge, but wisdom – to steer their ships and the industry as a whole toward safer waters in the future. 🌊