UDC 621.396.6:656.61:81'243
DOI https://doi.org/10.24919/2308-4863/82-2-55

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MARITIME RADIO COMMUNICATION: LANGUAGE CHALLENGES AND HOW TO HANDLE THEM

This article explores the nature of maritime English for radio communications and language difficulties, highlighting the complexities they create and their potential impacts. Additionally, it examines practical strategies and solutions designed to overcome these challenges – language barriers and training and standardizing communication protocols, technological innovations, intercultural competence, pedagogical approaches. Language barriers remain a primary concern, with many seafarers from non-English-speaking backgrounds struggling with English proficiency. The complexity of maritime terminology further complicates communication. Addressing these issues requires robust training programs that integrate general and specialized skills. Standardized communication protocols, such as the IMO Standard Marine Communication Phrases (SMCPs), are essential, especially with the rise of autonomous ships necessitating updated protocols for manned and unmanned operations. Technological advancements offer promising solutions, such as blockchain technology, which enhances communication security through decentralization, data integrity, and consensus mechanisms. Applications include secure cargo tracking, verified digital identities, and smart contracts. Implementing blockchain-based document management systems could further enhance efficiency and security. Intercultural competence is equally vital. Over 80% of maritime accidents stem from human factors, often due to miscommunication among diverse crews. Enhancing intercultural skills aligns with IMO standards and improves employability and collaboration. Innovative pedagogical approaches are crucial. Multiliteracy-based models incorporating linguistic, visual, audio, gestural, and spatial literacies better reflect maritime communication's complexity. Interactive teaching methods, equip students with practical skills for real-world scenarios. By addressing linguistic, technological, and educational challenges, the maritime industry can enhance safety and efficiency, ensuring adaptability to evolving demands.

Key words: *maritime radio protocols, language challenges, clear communication, standard implementation, navigation safety.*

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МОРСЬКИЙ РАДІОЗВ'ЯЗОК: МОВЛЕННЄВІ ТРУДНОЩІ ТА ШЛЯХИ ЇХ ПОДОЛАННЯ

У статті досліджено особливості морської англійської мови для радіозв'язку та мовних труднощів, висвітлено їхню складність і потенційні наслідки. Також розглянуто практичні стратегії та рішення для подолання цих викликів – мовні бар'єри й навчання, стандартизація протоколів зв'язку, технологічні інновації, міжкультурна компетентність і педагогічні підходи. Мовні бар'єри залишаються однією з головних проблем, адже багато моряків із неангломовних країн стикаються з труднощами у володінні англійською мовою. Складна морська термінологія ще більше ускладнює комунікацію. Для вирішення цих питань необхідні потужні навчальні програми, що інтегрують загальні та спеціалізовані навички. Стандартизовані протоколи зв'язку, такі як Стандартизовані морські комунікаційні фрази ІМО, є ключовими, особливо в умовах зростання використання автономних суден, що вимагає оновлення протоколів для взаємодії між керованими та автономними операціями. Технологічні досягнення пропонують перспективні рішення, наприклад, технологія блокчейн, яка підвищує безпеку комунікацій завдяки децентралізації, цілісності даних та механізмам консенсусу. Сфери застосування включають безпечне відстеження вантажів, верифіковані цифрові ідентифікатори та смарт-контракти. Впровадження систем управління документами на основі блокчейну може додатково підвищити ефективність і безпеку. Міжкультурна компетентність є не менш важливою. Понад 80% морських аварій спричинені людськими факторами, часто через непорозуміння серед екіпажів із різних культур. Підвищення міжкультурних навичок узгоджується зі стандартами ІМО, покращуючи працевлаштування та співпрацю. Інноваційні педагогічні підходи також мають вирішальне значення. Моделі, засновані на мультилітератності, які охоплюють лінгвістичні, візуальні, аудіальні, жестові та просторові аспекти, краще відображають складність морської комунікації. Усвідомлен-

ня мовних, технологічних та освітніх викликів дозволяє морській галузі підвищити безпеку та ефективність, забезпечуючи адаптацію до зростаючих вимог.

Ключові слова: *морські радіопротоколи, мовні проблеми, чітка комунікація, впровадження стандарту, безпека судноплавства.*

Problem statement. Communication is the cornerstone of effective maritime operations, as it facilitates the exchange of critical information between vessels, coastal stations, and other stakeholders. However, the maritime industry's inherent multilingual and multicultural nature often presents significant language barriers that can compromise safety and operational efficiency.

One of the primary challenges in maritime radio communication is the limited English proficiency among crew members. Despite the adoption of English as the official language of the maritime industry many seafarers, particularly from non-English-speaking countries, struggle to communicate effectively in English. This issue is exacerbated by the technical nature of maritime terminology, which can be difficult to comprehend even for native English speakers (Yercan et al., 2005).

Analysis of recent research and publications. In some research it has been highlighted the need for improved maritime English training programs that can better prepare maritime students and professionals for the demands of the industry. These programs should focus on developing both general and specialized maritime English skills, encompassing a wide range of communication scenarios, from routine operations to emergency situations. Additionally, the standardization of communication protocols and procedures can help mitigate the impact of language barriers. The theoretical basis of the communication problem is presented in the following research: challenges of integrating autonomous ships into maritime operations, particularly concerning Maritime English and the IMO Standard Marine Communication Phrases (Chirea-Ungureanu, 2021); the potential of blockchain in maritime communication security (Dimitrov & Mitishev, 2024); the critical need to enhance intercultural communication skills (Lyu, 2024); the need for improved Maritime English (ME) training (Yercan et al., 2005).

The purpose of the article is to provide the overview of the maritime English for radio communications and language challenges during sea operations and their potential impacts; to examine practical strategies and solutions designed to overcome these challenges.

Presentation of the main material. The need to reassess and adapt Maritime English and communication standards is predetermined by the emerging presence of autonomous ships in the maritime industry. Chirea-Ungureanu C. examines the challenges and implications of integrating autonomous ships into maritime operations, particularly concerning Maritime English and the IMO Standard Marine Communication Phrases (Chirea-Ungureanu, 2021). The main challenges presented in the article by Chirea-Ungureanu C. consist in the necessity for updated communication protocols. To ensure safe navigation in the future, especially in environments where both manned and unmanned ships operate simultaneously, there is a pressing need to develop and implement updated communication protocols that accommodate the unique requirements of autonomous maritime operations. Another challenge consists in Maritime Education and Training (MET)**.** Educators face the task of preparing students for roles that may not currently exist, utilizing technologies yet to be developed. This uncertainty complicates the development of curricula that effectively equip future maritime professionals with the necessary skills and knowledge.

In the research of maritime communication Dimitrov G., Mitishev I. explore the potential of blockchain in fortifying maritime communication security and how blockchain can strengthen maritime communication security. This technology has many advantages, which can increase security of communication, namely: it provides decentralization as block chain's peer-to-peer framework eliminates single points of failure, enhancing security; it ensures data integrity, once data is recorded, it cannot be altered; it creates consensus mechanisms which ensure that all network participants agree on data validity, preventing unauthorized changes. Also potential uses include secure cargo tracking, verified digital identities, and smart contracts for automating processes like ownership verification and payment settlements. The article suggests practical implementation of this technology – developing a blockchain-based document workflow management system to manage critical maritime documents securely (Dimitrov & Mitishev, 2024). So, we can agree with the authors that integrating blockchain technology into maritime communications can significantly enhance security and efficiency.

The problem discussed by Lyu X. underscores the critical need to enhance intercultural communication skills among maritime students to bolster shipping safety. Citing International Maritime Organization

data, it attributes over 80% of maritime accidents to human factors, with a significant portion stemming from intercultural miscommunications among seafarers of diverse nationalities. The author emphasizes that improving these skills aligns with IMO conventions and enhances students' employability and personal development (Lyu, 2024). To achieve this, the article recommends that maritime institutions revise curricula and create environments that foster intercultural competence, ensuring graduates meet competency standards. Additionally, it calls on shipping companies to value seafarer diversity by cultivating inclusive workplaces and living conditions, thereby maximizing each seafarer's potential.

Some research focus on the development of maritime English communication learning model based on multiliteracy pedagogy (Simanjuntak et al., 2024). It identifies challenges in current maritime English education, such as limited engagement with diverse communication modes and insufficient integration of cultural contexts. To address these issues, the study proposes a learning model that incorporates various literacies – linguistic, visual, audio, gestural, and spatial – to better reflect the multifaceted nature of maritime communication. The model advocates for interactive and student-centered teaching methods, including simulations and collaborative tasks, to foster practical communication competencies. By adopting this approach, the article argues that maritime education can produce professionals who are more adept at navigating the complex communicative demands of the global maritime industry.

The article by Yercan F., Fricke D., Stone L. emphasizes the need for improved Maritime English (ME) training to enhance maritime transportation safety. It identifies key challenges, such as inconsistencies in training approaches and varying proficiency levels among maritime professionals. To address these, the authors propose several strategies. First, they recommend adopting a standardized ME curriculum aligned with International Maritime Organization (IMO) standards. This ensures uniformity in the competencies developed across institutions. Second, they advocate for interactive and practical training methods, such as role-playing, simulations, and case studies, which mirror real-life maritime communication scenarios. Third, the authors emphasize the need for continuous professional development for instructors, ensuring they remain adept with evolving industry requirements. Finally, the study suggests implementing rigorous assessment frameworks that evaluate not only linguistic knowledge but also the practical application of ME in safety-critical situations. Collectively, these strategies aim to foster effective communication and enhance global maritime safety (Yercan et al., 2005).

The researches presented in this article highlight several critical areas for improving communication within the maritime industry. Communication is an essential component of maritime operations, enabling the effective exchange of information among stakeholders such as vessels, coastal stations, and shipping companies. However, the multilingual and multicultural nature of the industry introduces significant challenges, which require comprehensive solutions to ensure safety and operational efficiency. In the article we have pointed out 4 areas for the discussion related to the improvement of effective maritime communications – language barriers and training and standardizing communication protocols, technological innovations, intercultural competence, pedagogical approaches.

1. Language Barriers and Training

A recurring theme across the studies is the pressing need to address language barriers. Despite the designation of English as the official language of maritime operations, varying levels of English proficiency among seafarers, especially those from non-English-speaking countries, pose a significant risk. Technical maritime terminology adds another layer of complexity, making it difficult even for native English speakers to comprehend some communications. To mitigate this, maritime English training programs must evolve. Such programs should combine general and specialized language instruction to prepare maritime professionals for a range of scenarios, including emergencies.

Standardizing communication protocols, such as the IMO Standard Marine Communication Phrases (SMCPs), emerges as a vital strategy. As Chirea-Ungureanu C. argues, the adaptation of these standards is particularly crucial in light of emerging technologies, including autonomous ships. The integration of updated communication protocols that accommodate both manned and unmanned ships is imperative to maintain safe and efficient operations in the future maritime landscape (Chirea-Ungureanu, 2021).

2. Technological Innovations

Technological advancements offer promising solutions to enhance maritime communication. It was explored the potential of blockchain technology in addressing security vulnerabilities (Dimitrov & Mitishev, 2024). By ensuring decentralization, data integrity, and consensus among network participants, blockchain can safeguard critical communications.

Applications such as secure cargo tracking and smart contracts can further streamline maritime operations, emphasizing the need to integrate such innovations into existing systems. The development of blockchain-based document management systems presents a tangible step toward this goal, offering enhanced security and efficiency.

3. Intercultural Competence

Intercultural communication skills are another critical focus area. As highlighted by Lyu X., over 80% of maritime accidents stem from human factors, with intercultural miscommunications playing a significant role (Lyu, 2024). Enhancing these skills aligns with IMO conventions and boosts the employability and effectiveness of maritime professionals. Institutions must revise curricula to include intercultural competence training and create inclusive environments that celebrate diversity. Shipping companies also have a role in fostering such environments, ensuring seafarers from diverse backgrounds can collaborate effectively.

4. Pedagogical Approaches

The need for innovative teaching methods in maritime education is underscored by the challenges of current approaches. As Yercan F., Fricke D., Stone L. argue, standardizing Maritime English curricula and implementing rigorous assessment frameworks are essential steps to achieve consistency in training outcomes across institutions globally (Yercan et al., 2005). Incorporating multiliteracy pedagogy – addressing linguistic, visual, audio, gestural, and spatial literacies – can better reflect the complex communication demands of the maritime industry. Interactive methods, such as simulations and collaborative tasks, can help students develop practical skills applicable to real-world situations.

Conclusion and perspectives. The discussions surrounding maritime communication reveal a multi-faceted challenge requiring a combination of linguistic, technological, and pedagogical strategies. By addressing language barriers, integrating advanced technologies like blockchain, fostering intercultural competence, and adopting innovative teaching approaches, the maritime industry can enhance safety and operational efficiency. The collaboration among maritime institutions, regulators, and shipping companies is crucial to implementing these improvements, ensuring the industry remains adaptable to its evolving demands.

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