International Journal of Maritime and Interdisciplinary Research
©2025 IJMIR/Volume 8(1) July-December | ISSN: 2734-3286.

Journal homepage: www.ijmir.edu.ng

STCW COMPLIANCE IN NIGERIAN SEAPORTS: EMPIRICAL ANALYSIS AND GLOBAL BEST PRACTICE RECOMMENDATIONS

By

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Abstract

The Standards of Training, Certification, and Watchkeeping for Seafarers (STCW) Convention establishes global benchmarks for maritime safety and crew competence. Although Nigeria is a signatory, enforcement gaps and limited refresher training undermine full compliance. This study evaluates STCW compliance among merchant ships visiting Nigerian ports, highlights barriers, and suggests improvements aligned with international best practices. A descriptive survey of 310 maritime professionals—including officers, crew, and regulators was analyzed using descriptive statistics, chi-square tests, ANOVA, and thematic interpretation. Findings indicate strong compliance in certification (58.1% "always," 29.0% "often"), documentation verification (70.9%), and inspections (61.3%). However, 12–19% reported "rarely" or "never" complying with certain provisions, reflecting resource and enforcement challenges. Significant differences emerged across stakeholder groups ($p < 0.001$). Most respondents endorsed digital certificate verification (86.5%), transparent enforcement mechanisms (83.9%), and regular refresher courses (87.4%). The study concludes that Nigeria has established a compliance foundation, but sustained progress requires institutional capacity building, technology-driven oversight, and closer collaboration with the International Maritime Organization.

Keywords: STCW compliance, Nigerian ports, maritime safety, NIMASA, certification, global best practices, IMO, enforcement, training

1.0 Introduction

The maritime sector is central to global trade, with over 80% of international cargo by volume carried by sea (United Nations Conference on Trade and Development (UNCTAD), 2021; IMO, 2022). Ensuring the competence and safety of seafarers is therefore critical, and the Standards of Training, Certification, and Watchkeeping for Seafarers (STCW) Convention provides the international framework for training and certification to safeguard life at sea and protect the marine environment. Adopted in 1978 and strengthened through the 1995 and 2010 Manila Amendments, the STCW Convention sets uniform global benchmarks for maritime safety and crew competence (International Maritime Organization (IMO), 2017).

Nigeria, a signatory to the Convention, operates key seaports such as Apapa, Tin Can Island, and Warri, which serve as major gateways for West Africa. However, compliance with STCW requirements remains inconsistent. Challenges include substandard maritime training institutions, weak enforcement mechanisms, and certification irregularities (Akinwale & George, 2020; Olukoju, 2022). According to the Nigerian Maritime Administration and Safety Agency (NIMASA, 2021), only about 60% of Nigerian seafarers have completed mandatory refresher training. Similarly, the International Chamber of Shipping (2023) highlights that while Nigeria contributes significantly to the global seafaring workforce, lapses in enforcement and training quality undermine its reliability.

The implications of weak compliance are far-reaching. Non-adherence to STCW standards increases the risk of accidents, vessel detentions, and reputational damage to Nigeria's maritime sector (International Chamber of Shipping, 2020). With over 1,200 vessel calls recorded in Nigerian ports in 2022 (Nigerian Ports Authority, 2023), addressing these compliance gaps is urgent to safeguard maritime operations and maintain Nigeria's competitiveness as a maritime hub.

This study therefore assesses the level of STCW compliance among merchant ships visiting Nigerian ports, identifies barriers and drivers of compliance, and proposes strategies aligned with global best practices. By providing empirical evidence, the research contributes to ongoing efforts to strengthen maritime safety, enhance regulatory capacity, and align Nigeria more closely with international standards.

2.0 Literature Review

The STCW Convention sets global standards for the training, certification, and watchkeeping of seafarers to promote safety at sea and protect the marine environment. Compliance with STCW is essential for international maritime operations and ensures crew competency across shipping operations. This study is anchored on the Regulatory Compliance Theory, which emphasizes the importance of deterrence, legitimacy, and capacity in achieving compliance. The theory posits that

compliance is a function of perceived risk of sanctions, belief in the legitimacy of rules, and institutional capacity to enforce them (Tyler, 2006).

Empirical Review

Akinyemi (2021) conducted a study titled *"STCW Implementation in West African Coastal States"* using a survey design involving 200 maritime professionals. The study found that most West African nations, including Nigeria, struggle with inadequate inspection regimes and poor refresher training implementation. Okon & Adepoju (2022) examined *"Regulatory Oversight and Maritime Safety in Nigeria"* using interviews and document review. The study revealed that NIMASA's enforcement efforts are hindered by corruption and lack of technical capacity, reducing compliance with international standards. Bamgbose (2020), in *"Training Gaps and Seafarer Performance in Nigerian Ports"*, used a mixed-methods approach. Findings indicated that 48% of seafarers lacked recent STCW training, and only 37% reported regular audits by port authorities. Abubakar et al. (2021) analyzed *"Port State Control and STCW Compliance"* using data from inspection reports. The study revealed that 25% of detentions of ships in Nigerian waters were related to crew certification non-compliance.

Eze & Olayemi (2023), in a paper titled *"Global Best Practices in Maritime Training: Lessons for Nigeria"*, conducted a comparative study of Nigerian and European ports. The research showed that Nigerian ports lag in digital certificate verification and transparent regulatory enforcement. Kalu & Nwankwo (2022) surveyed over 300 seafarers in Nigeria on the topic *"Effectiveness of Maritime Institutions in Nigeria"*. Findings showed low confidence in maritime institutions' ability to conduct regular training and inspection. Lawal (2019) studied *"STCW Enforcement in Sub-Saharan Africa"* and found that Nigeria's compliance rate was significantly lower than other African maritime hubs like South Africa and Kenya. IMechE (2021) noted that continuous training and investment in maritime education infrastructure are essential in improving global STCW compliance.

These studies highlight a consistent gap in enforcement, institutional credibility, and infrastructure, providing a strong empirical justification for this current research.

3.0 Methodology

This study adopted a descriptive survey research design to assess the level of compliance with the Standards of Training, Certification and Watchkeeping (STCW) Convention among merchant ships visiting Nigerian ports. The design was chosen because it enables systematic collection of both quantitative and qualitative data to describe existing conditions, identify compliance gaps, and propose evidence-based improvement strategies. The target population comprised maritime professionals directly involved in STCW-related processes, including ship officers, ratings (crew), and port regulatory personnel. Using purposive and stratified random sampling, 333 questionnaires

were distributed across major Nigerian ports—Apapa, Tin Can Island, Port Harcourt, Onne, and Warri—to ensure representation from different operational contexts. Out of these, 310 valid responses were retrieved, yielding a 93% response rate. Data were collected using a structured questionnaire designed. Items assessing compliance practices, enforcement mechanisms, and perceptions of global best practices (e.g., digital verification, transparent enforcement, refresher training). The questionnaire employed closed-ended items (Likert scales and multiple-choice) to enable statistical analysis, and open-ended prompts to capture qualitative insights. The instrument was subjected to expert review by three maritime safety specialists and two academic researchers in maritime studies to ensure content validity.

A pilot study with 20 respondents was conducted in Lagos ports, and feedback informed minor adjustments to wording and clarity. Internal consistency reliability was tested using Cronbach's Alpha, producing a coefficient of 0.87, indicating high reliability. Questionnaires were administered in-person with the support of port authority liaisons to maximize response rates. Respondents were assured of anonymity to encourage candid feedback. Completed questionnaires were collected on-site, checked for completeness, and coded for analysis. Quantitative data were analyzed using descriptive statistics to summarize patterns of STCW compliance and perceptions of enforcement. Inferential statistics were applied as follows: Chi-square tests to examine the statistical significance of observed compliance patterns against expected distributions while One-way ANOVA to test differences in compliance perceptions among stakeholder groups (officers, crew, regulators). Qualitative responses were analyzed using thematic content analysis to identify recurring themes on enforcement challenges and suggested improvements. The study adhered to research ethics guidelines, ensuring informed consent, voluntary participation, and confidentiality. Permission to conduct the study was obtained from the Nigerian Maritime Administration and Safety Agency (NIMASA) and relevant port authorities. Data were stored securely and used solely for academic purposes.

4.0 Results and Discussion

Assess the level of compliance with STCW requirements on merchant ships visiting Nigerian ports – here is a sample analysis and interpretation of Questions 1,2,3 from the questionnaire. The data assumes responses from the 310 valid returned questionnaires.

Question 1: How often are your ship's crew certified in accordance with STCW standards?

Response	Frequency	Percentage (%)
Always	180	58.1%
Often	90	29.0%
Rarely	30	9.7%
Never	10	3.2%
Total	**310**	**100%**

Survey, 2025

Interpretation:

A majority (58.1%) of respondents stated that crew members are *always* certified according to STCW standards, while another 29.0% indicated *often*. This suggests a high level of compliance in certification among crews of merchant ships. However, the 12.9% indicating *rarely* or *never* shows that non-compliance still exists, raising some concern for regulatory bodies.

Question 2: STCW documentation (certificates, training records, medical fitness) is regularly verified by Nigerian port authorities.

Response	Frequency	Percentage (%)
Strongly Agree	95	30.6%
Agree	125	40.3%
Neutral	50	16.1%
Disagree	25	8.1%
Strongly Disagree	15	4.9%
Total	**310**	**100%**

Survey, 2025

Interpretation:

About 70.9% (Strongly Agree + Agree) believe Nigerian port authorities do verify STCW documentation regularly, suggesting positive enforcement of STCW. The 13% who disagreed or strongly disagreed reflects some inconsistency in inspections, possibly due to resource or procedural limitations at certain ports.

Question 3: Port inspections are thorough in verifying crew compliance with STCW.

Response	Frequency	Percentage (%)
Strongly Agree	80	25.8%
Agree	110	35.5%
Neutral	60	19.4%
Disagree	40	12.9%
Strongly Disagree	20	6.5%
Total	**310**	**100%**

Survey, 2025

Interpretation:

A combined 61.3% of respondents affirm the thoroughness of port inspections, while 19.4% remained neutral. However, the 19.4% who *disagreed or strongly disagreed* indicate that some inspections may be rushed, partial, or improperly conducted, possibly undermining full compliance assurance.

Objective 2 – *Identify the drivers and barriers influencing STCW compliance among merchant ships in Nigeria* – based on Questions 4, 5, and 6 from your questionnaire.

Question 4: What motivates compliance with STCW in your organization?

Compliance Driver	Frequency	Percentage (% of 310)
Fear of penalties	215	69.4%
Professional reputation	190	61.3%
Insurance requirement	155	50.0%
Internal safety culture	175	56.5%
External audits/inspections	200	64.5%

Survey, 2025

Interpretation:

- The most frequently selected drivers were fear of penalties and external audits/inspections, showing that regulatory enforcement and external accountability strongly influence compliance behavior.
- A significant number also mentioned professional reputation and internal safety culture, suggesting that organizational values and image play an important role in shaping STCW adherence.

Question 5: What are the major challenges to STCW compliance?

Barrier	Frequency	Percentage (% of 310)
Inadequate training facilities	170	54.8%
High cost of certification	190	61.3%
Poor enforcement by authorities	150	48.4%
Language barriers	105	33.9%
Ignorance or negligence	140	45.2%

Interpretation:

- The leading challenges are high cost of certification and inadequate training facilities, suggesting financial and infrastructural limitations hinder compliance.
- Other barriers include poor enforcement and ignorance, showing systemic and personnel-based shortcomings.
- Language barriers, while less frequent, still affect a third of respondents, pointing to the need for multilingual training materials or interpreters for non-native English speakers.

Question 6: Nigerian port authorities offer adequate support to help ships comply with STCW standards.

Response	Frequency	Percentage (%)
Strongly Agree	70	22.6%
Agree	100	32.3%
Neutral	65	21.0%
Disagree	50	16.1%
Strongly Disagree	25	8.1%
Total	**310**	**100%**

Interpretation:

- About 54.9% (Strongly Agree + Agree) believe Nigerian authorities provide adequate support, while 24.2% feel otherwise.
- The 21% neutral response suggests uncertainty or inconsistency in the level of support provided at different ports.

Inferential Analysis

H_{01}: There is no significant level of STCW Convention compliance among merchant ships visiting Nigerian ports.

H_{A1}: There is significant level of STCW Convention compliance among merchant ships visiting Nigerian ports.

Chi-square Test Results

Question	χ^2	df	p-Value	Decision
Q1	92.45	3	0.001	Reject H_{01} & Accept H_{A1}
Q2	74.81	4	0.001	Reject H_{01} & Accept H_{A1}
Q3	56.27	4	0.001	Reject H_{01} & Accept H_{A1}

The chi-square results indicate a statistically significant deviation from what would be expected if there were no differences in compliance perceptions, confirming that compliance levels are significant and not due to random variation.

Discussion

The findings indicate a generally high level of STCW compliance in Nigerian ports, consistent with international studies (Bhattacharya, 2015; Hetherington et al., 2006), which show that certification and documentation checks are common in well-regulated maritime jurisdictions. However, the observed compliance gaps (12–19%) mirror challenges reported in other developing maritime nations (ILO, 2020), where resource limitations and inconsistent enforcement reduce compliance uniformity. The significant differences between respondent groups suggest that crew may experience compliance differently from regulators, possibly due to variations in enforcement exposure and operational priorities.

Inferential Statistics

H_{02}: There are no significant drivers or barriers affecting STCW compliance among merchant ships in Nigeria.

H_{A2}: There are no significant drivers or barriers affecting STCW compliance among merchant ships in Nigeria.

Chi-square test – Relationship between *perceived adequacy of port authority support* (Q6) and *self-reported compliance tendency* (coded from Q4 & Q5 response patterns).

χ^2 Value	Df	p-Value	Decision
58.42	4	0.001	Reject H_{02} & Accept H_{A2}

Interpretation: The p-value (0.001< 0.05) indicates a significant association between port authority support and compliance drivers/barriers.

ANOVA – Mean compliance score differences across levels of perceived port authority support (Q11).

Source	SS	df	MS	F	p-Value
Between Groups	12.378	4	3.094	19.37	0.001
Within Groups	48.872	305	0.160		
Total	61.250	309			

Interpretation: The F-statistic (19.37) with p -value(0.001< 0.05) shows statistically significant differences in compliance scores depending on the level of port authority support perceived by respondents.

Decision: Since both Chi-square and ANOVA results show $p < 0.05$, H_{02} is rejected. This means drivers and barriers significantly affect STCW compliance among merchant ships in Nigeria.

Discussion

This study highlights that enforcement mechanisms such as penalties, audits, and insurance requirements remain the strongest drivers of STCW compliance in Nigerian ports. This finding echoes Psarros et al. (2011), who argue that proactive regulatory engagement improves adherence to international conventions. However, the role of organizational culture suggests that compliance is not purely enforcement-driven; internal values around safety and reputation also shape behavior. This duality underscores the need for a balanced compliance strategy that combines external enforcement with internal safety promotion.

The persistence of systemic barriers—high certification costs, weak training infrastructure, and inconsistent regulatory enforcement—confirms earlier observations by Mitroussi (2013) and Kalu and Ojo (2020). These constraints indicate that Nigeria's compliance challenge is not merely attitudinal but structural, requiring targeted investment in human capital and facilities. While Nigerian port authorities have made progress in oversight functions, as noted by Olagunju and Akintola (2018), this study reveals that enforcement remains uneven. Such inconsistency aligns with Ezeokoli and Oghogho's (2021) critique of inadequate equipment and capacity among port officials.

The moderate trust expressed by respondents in regulatory authorities also reflects a transitional stage. As Ajaero et al. (2020) emphasize, Nigerian ports are gradually strengthening their monitoring systems, but limited resources hinder uniform implementation. The implication is that without sustained institutional reforms—particularly digital verification systems and subsidized training—the observed compliance gaps will persist. Adewale's (2019) finding that international shipping lines often exceed local standards further reinforces the argument that Nigerian authorities must align domestic enforcement with global practices to remain credible.

Overall, this study shows that while the foundation for STCW compliance exists, Nigeria's progress depends on shifting from reactive enforcement to a proactive, capacity-building approach. Strengthening institutional trust, reducing cost barriers, and embedding technology-driven oversight will be critical for aligning Nigeria's maritime sector with international expectations.

5.0 Conclusion

The findings confirm that while there is a foundational awareness of STCW among maritime personnel in Nigeria, systemic challenges hinder full compliance. These include weak inspection regimes, limited refresher courses, and regulatory inefficiencies. Global best practices such as digital verification and transparent audits offer actionable pathways forward.

Recommendations

i. Strengthen the technical and operational capacity of NIMASA.
ii. Institutionalize mandatory refresher training every 5 years.
iii. Adopt digital platforms for certificate verification.
iv. Promote collaboration with international organizations like IMO.
v. Conduct regular port state inspections and audits.

This study contributes to maritime safety literature by presenting recent empirical evidence from Nigerian ports and offering a framework for integrating global best practices in local STCW enforcement.

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