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Comparative Evaluation and Regulatory Gaps in the Bangladesh's Inland Shipping Ordinance 1976 Against Classification Society Standards: Implications for Ferry Safety Reform

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Abstract

Inland Water Transport (IWT) is the backbone of Bangladesh's economy and its social life.However, its potential isalways wasted becauseof the high frequency of ferry accidents. The present study investigates the systemic regulatory failures that cause these events. Qualitative comparative analysis has been used to examine the Inland Shipping Ordinance 1976 (ISO 1976) in Bangladesh. This domestic law is compared against the comprehensive rules of three leading classification societies: Det Norske Veritas (DNV), Bureau Veritas (BV), and the American Bureau of Shipping (ABS). These international organizations maintain advanced maritime safety standards. Analysis was structured into nine key safety areas and discussed in the context of a case study of the 2021 Ro-Ro Ferry Amanat Shah accident. The analysis finds that ISO 1976 is well behind the times and requires upgradationacross all nine categories, ranging from design life to survey arrangements. The ordinance provisions tendto becompletely nonspecific or generalized on crucial safety matters carefully outlined in classification society rules. These regulatory loopholes were found to be directly correlated with the causative factors of the Amanat Shah accident, such as the ship's advanced age, unresolved stability issues, and a poor survey track record.Bangladesh's IWT sector's persistent safety crisis is a consequence of a stagnant, inadequate local regulatory system that has lagged behind modern maritime safety standards. There is an urgent and fundamental need to reform ISO 1976on the basis of best-practice principles and technical guidelines.

Keywords: Classification Society; Inland Water Transport, Inland Shipping Ordinance; Ferry Accident; Maritime Safety.

1. Introduction

1.1 Background and Significance

Bangladesh's widespread 24,000 km waterway network is a critical component of its national transport infrastructure, making Inland Water Transport (IWT) a necessity for the economy and rural population. The sector carries over 100 million passengers and 30 million metric tons of freight annually (Rahman 2021). Despite its socio-economic importance, Bangladesh's IWTsector is troubled by a high frequency of ship accidents, leading to significant loss of life and property (Mia et al. 2021; Uddin and Awal 2017).

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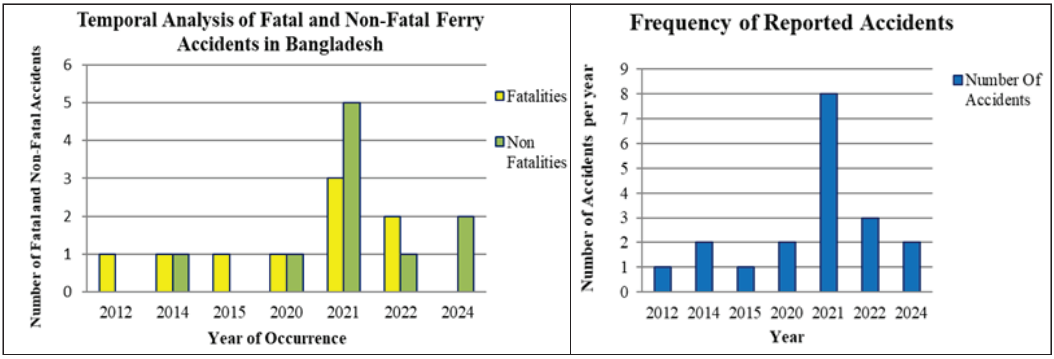
Bangladesh has a history of significant maritime incidents involving its broad inland ferry network, as summarized in Figure 1. On March 13, 2012, the double-deck ferry MV Shariatpur 1 capsized after a collision with a cargo vessel on the Meghna River near the Munshiganj District, resulting in 147 reported fatalities. Two years later, on May 15, 2014, the MV Miraj-4, a double-decker, capsized in the Meghna River. This incidentcaused an official death toll of 54, with many others missing. Later that year, on August 4, 2014, the Pinak-6 capsized on the Padma River with approximately 200 people on board. Although around 100 were rescued, about 50 were presumed dead or missing. Another major incident occurred on February 22, 2015, when a ferry capsized in the Padma River after a collision, and the lives of70 people were compromised. (Local and International News Reports)



(a) (b)

Figure 1: Ferry Accident Incidents in Bangladesh (2012-2024), (a) Categorized by Incidents with Fatal and Non-fatal Accidents, (b) Number of Accidents Per Year.

More recently, on June 29, 2020, the MV Morning Bird was struck from behind by another ferry and sank in Dhaka, causing at least 30 deaths. The following year, several accidents were reported, including the sinking of the ML Rabit Al Hasan on April 4, 2021, in the Shitalakshya River after colliding with a cargo vessel, which led to 35 deaths. The very next day, another ferry, the ML Sabit Al Hasan, sank in the same river under similar circumstances, killing at least 26 people. Collisions with infrastructure have also been noted between July and August 2021, the ferries Kakoli, Birshreshtha Jahangir, and Shahjalal all collided with pillars of the Padma Bridge, causing damage and injuries but no fatalities. On October 27, 2021, the 1980-built Ro-Ro Ferry Amanat Shah capsized while offloading vehicles at the Paturia ferry terminal in Manikganj, Bangladesh. Multiple regulatory failures were found in this case. A significant fire aboard the MV Avijan-10 near Jhalakathi in December 2021 resulted in at least 39 deaths and over 100 injuries.

In 2022, incidents continued with a ferry sinking near Dhaka on March 20, killing at least six people. On August 15, a boat carrying 21 passengers sank after being hit by a cargo ship on the Dhaleshwari River, though all aboard somehow managed to swim to shore. A major disaster occurred on September 25, when an overcrowded boat capsized, leading to a death toll of 66. The trend of accidents has persisted, as detailed further in Figure 1, and on January 17, 2024, the Ro-Ro ferry Rajanigandha-7 sank near Paturia after being hit by a dredger. On January 27, 2024, two passenger launches, the Sundarban-11 and Surovi-9, collided on the Dhaka-Barisal route, though no casualties were reported. (Local and International News Reports)

1.2 The Problem: A Legacy of Accidents

Decades of accident data identify collision, capsizing, overloading, and stability failure as the primary causes (Hossain and Awal 2014; Islam et al. 2021). As illustrated in Figure 1, ferry accidents are a continual issue, with a dramatic spike in fatal incidents in 2021, underscoring the urgency of the problem. These events are not random but point to systemic limitations in safety management and regulatory oversight. Even though accidents that were caused by unfortunate and unnatural means cannot be controlled, accidents caused by regulatory limitations can surely be addressed and rectified. This is the purpose of this research to address those regulatory concerns and approach solutions.

1.3 Literature Review and Regulatory Context

A review of existing literature reveals a strong focus on accident statistics and socio-economic factors. Awal (2007) utilized a descriptive statistical methodology to categorize accidents, finding that 80% of incidents involved collisions.Iqbal et al. (2007) investigated vessels between 1981 and 2005, identifying stability breakdowns and overcrowding as primary contributors to structural failures. Furthermore, Uddin et al. (2017) conducted a decade-long analysis (2005-2015) which spotlighted suboptimal vessel design as a probable cause for sinkings.

Beyond the local context, international research highlights similar systemic flaws. Kim and Lee (2017) and Park and Park (2017) analyzed the MV Sewol disaster in South Korea, concluding that 'regulatory capture'where industry pressure leads to the erosion of safety standardswas a root cause of the tragedy. Additionally, Nwokedi et al. (2022) examined the performance of

Table 1: Previous Researchon Maritime Safety Research

Reference	Methodology	Primary Findings/Objective
Awal (2007)	Descriptive Statistical Categorization	Analyzed accident frequency to identify collision as the dominant incident type (80%).
Iqbal et al. (2007)	Historical Vessel Investigation (1981– 2005)	Correlated stability breakdowns and overcrowding with systemic structural failures.
Uddin et al. (2017)	Decade-long Trend Analysis (2005–2015)	Identified suboptimal vessel design as a primary causal factor for ferry sinkings.
Kim and Lee (2017)	Systemic Accident Analysis (AcciMap/STAMP)	Evaluated the balance between organizational learning and legal accountability in disasters.
Park and Park (2017)	Socio-Political Policy Analysis	Identified 'regulatory capture' where industry pressure led to the erosion of safety standards.
Nwokedi et al. (2022)	Empirical Performance Modeling	Verified that IACS-certified vessels demonstrate significantly lower rates of safety defaults.

classification societies under the Abuja MoU, providing empirical evidence that vessels certified by IACS members consistently demonstrate lower rates of safety defaults.

1.4 Identification of Research Gap and Objective

While global literature has successfully identified the 'what' and 'why' of maritime disasters through statistical and socio-economic lenses, a critical gap remains in the absence of a line-by-line technical evaluation between aging domestic ordinances and modern international standards. This research fills that void by transitioning from descriptive statistics to a systematic, technically detailed comparison between the nearly 50-year-old ISO 1976 (Government of the People's Republic of Bangladesh 1976) and the evolving rules of IACS-member classification societies. Consequently, the study is structured to achieve the following four technical objectives:

Objective 1: To perform a systematic, qualitative gap analysis between the Inland Shipping Ordinance 1976 and IACS standards (DNV, BV, ABS) across nine safety domains critical to ferry seaworthiness. Objective 2: To evaluate the structural and fatigue implications of the 30-year operational limit permitted by ISO 1976 against the 20–25 years fatigue assessment norms established by international classification societies. Objective 3: To identify specific technical voids in Bangladesh's domestic legislation, particularly concerning welding process evaluation, ballast water management, and damage stability criteria. Objective 4: To utilize the 2021 Amanat Shah accident as a representative technical benchmark, demonstrating how these identified regulatory gaps directly manifest as operational failures in the Inland Water Transport (IWT) sector.

2. Methodology

2.1 Research Design

This study employs a qualitative comparative analysis as its core methodological framework (Lee, M. J. 2016).Unlike purely descriptive methods, QCA allows for a 'configurational' comparison, identifying how the absence of specific technical requirements in the ISO 1976 creates conditions for systemic failure. This approach is specifically aligned with the research objectives as it moves beyond identifying that a gap exists to quantifying what the technical void entails. The QCA was operationalized through a four-phase process: (1) identification of safety domains based on historical accident data; (2) extraction of prescriptive rules from IACS (DNV, BV, ABS) and ISO 1976; (3) cross-jurisdictional mapping; and (4) validation of these findings through the Amanat Shah case study.

2.2 Data Sources

The analysis integrates three primary data sources to ensure technical rigor:

- **Domestic Legislation:** The Inland Shipping Ordinance 1976, which serves as the current legal baseline for Bangladesh's IWT sector.
- **International Technical Standards:** Publicly available 2023 rulebooks from DNV(DNV 2023), BV (BV 2023), and ABS (ABS 2023) were selected as they represent the highest standards of the International Association of Classification Societies (IACS).
- **Case Study Documentation:** Factual information regarding the capsizing of the Ro-Ro Ferry Amanat Shah on October 27, 2021, was reviewed.

2.3 Analytical Framework

Rule-based approach enables the assessment of systemic, root-cause problems that contribute to accidents, thereby avoiding the limitations of often-unavailable public accident reports (Zhang and Wang 2019).The comparison was categorized across nine pre-selected technical and regulatory domains critical to vessel safety: (1) Design Life/Service Life, (2) Structural Strength, (3) Environmental Protection, (4) Welding Process Evaluation, (5) Safety Equipment, (6) Stability, (7) Ballast Water Management, (8) Docking Analysis, and (9) Survey Arrangement. These domains are deeply interconnected, forming a complex web of safety dependencies.

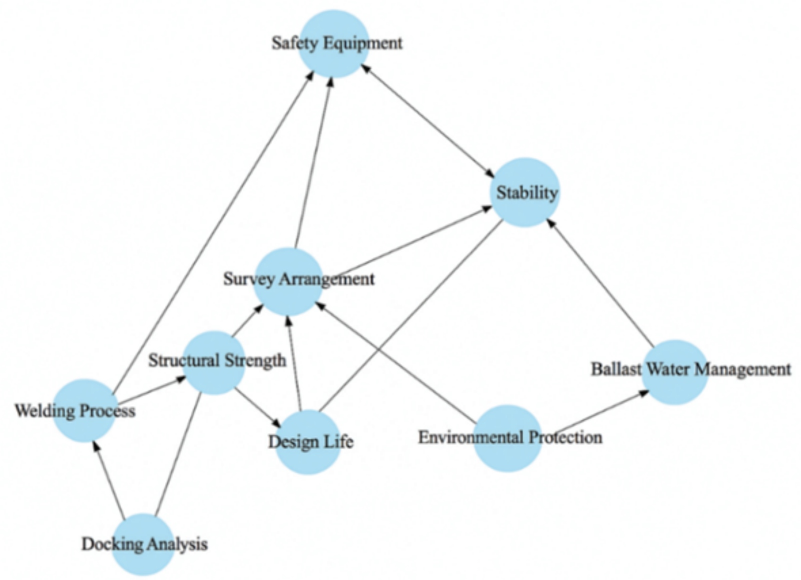


Figure 2: Causal Loop Diagram Based on Interrelations of Maritime Safety Criteria.

The analytical framework presented in Figure 2 is an original construct developed to map the causal dependencies within the maritime safety system. It is grounded in the System-Theoretic Accident Model and Processes (STAMP) framework (Leveson 2004; Awal2017), which conceptualizes that safety is an emergent property resulting from proper design and enforcement constraints. This model illustrates how a deficiency in Domain 4 (Welding Process Evaluation) or Domain 2 (Structural Strength), both of which are currently unregulated in the ISO 1976is not an isolated failure but a precursor that compromises the entire 'safety stack,' eventually manifesting as a loss of stability (Domain 6). For each domain, the provisions of the ISO 1976 were systematically identified and then directly compared with the corresponding rules of DNV, BV, and ABS to pinpoint specific regulatory voids (Government of the People's Republic of Bangladesh 1976;DNV 2023; BV 2023; ABS 2023).

3. Case Study, Analysis and Results

This section presents the objective findings of the comparative analysis. It begins with a summary of the Amanat Shah accident to establish the practical context, followed by the systematic comparison of the ISO 1976 and classification society standards across the nine analytical domains.

3.1 Case Study Context: Regulatory Failures in the Amanat Shah Accident

3.1.1 Rationale for Case Selection

The selection of the Amanat Shah Ro-Ro ferry as the primary case study for this research is based on its status as a 'critical case' that exemplifies the convergence of multiple regulatory failures identified in the ISO 1976 framework. Unlike accidents caused solely by human error or weather, this incident was a direct consequence of a 'multi-domain' breakdownspecifically involving advanced vessel age (41 years), unaddressed stability issues (11.43° initial list), and the omission of technical protocols such as welding quality checks and hull thickness gauging during repairs. This specific case allows for a generalized assessment of the Inland Shipping Ordinance's effectiveness, as the vessel's continued operation directly exploited the legal permissiveness regarding service life extensions and the lack of prescriptive technical oversight found in modern IACS standards.

On October 27, 2021, the 1980-built Ro-Ro Ferry Amanat Shah capsized while offloading vehicles at the Paturia ferry terminal in Manikganj, Bangladesh. The accident, following the ferry having suffered a critical list during travel, was followed by a massive salvage operation, but fortunately,there was no loss of human life. The incident was investigated and concluded to have been the direct outcome of a chain of technical, operational, and regulatory failures.

The primary failures identified are summarized in Table 2. These failures provide a clear indication of the regulatory drawbacks that will be detailed in the subsequent comparative analysis.

Table 2: Summary of Key Regulatory and Operational Failures in the Amanat Shah Accident

Failure Category	Description
Vessel Age and Condition	The vessel was over 40 years old, operating well beyond the typical 20-25years design life assumed by classification societies for fatigue analysis.
Survey and Certification	The ferry lacked an up-to-date survey certificate, indicating a critical lapse in regulatory oversight of its seaworthiness.
Maintenance and Repair	Recent repair work in July 2021 was inadequate, omitting essential processes such as sandblasting, welding quality checks, and hull thickness gauging.
Structural Integrity	The investigation noted that previous docking opportunities to address known issues, such as small holes in the hull, were missed, leading to progressive deterioration.
Stability and Ballast	Improper management of ballast water was a significant factor. The vessel was operating with a noticeable list, a clear sign of instability that was not rectified.
Loading and Cargo Ops	The sequence of unloading trucks at the terminal exacerbated the existing list, contributing directly to the capsizing. Weight management protocols were not followed.
Crew and Safety Culture	There was a noted lack of crew authority to enforce safety protocols, particularly concerning vehicle movements and passenger compliance.

3.2 Comparative Analysis of Regulatory Standards

The following subsections present a direct comparison of the provisions within the ISO 1976 and the rules of the selected classification societies for each of the nine safety domains.

3.2.1 Design Life / Service Life

A fundamental difference exists in the prescribed operational lifespan of a vessel. The ISO 1976 allows for a significantly longer service life than is considered standard practice by international bodies, which base their shorter design life on rigorous fatigue analysis.

Table 3: Comparison of Design Life / Service Life Regulations

Aspect	Inland Shipping Ordinance 1976	DNV and Bureau Veritas (BV)	American Bureau of Shipping (ABS)
Prescribed Life	Initial 30-year registration validity.	Target design life of 25 years for fatigue assessment.	Target design life of 20 years for fatigue assessment.
Extension	Possible 5-year extensions after a "special inspection," which can be renewed.	Not applicable; fatigue life is a design parameter, not a fixed operational limit subject to simple extension.	Not applicable; as above.

3.2.2 Structural Strength

The requirements for ensuring a vessel's structural integrity show a significant contrast between the unspecified, discretionary language of the ISO 1976 and the highly prescriptive, engineering-based rules of the classification societies.

Table 4: Comparison of Structural Strength Guidelines

Aspect	Inland Shipping Ordinance 1976	DNV, BV, and ABS
General Requirement	Allows the registrar to refuse registration if a ship has "mechanical or structural problems," but provides no specific technical criteria.	Provide extensive, detailed rules for hull scantlings, framing systems, and material strength based on vessel type, size, and operational loads.
Specifics for Ro-Ro	No specific provisions for Ro-Ro vessels.	Detailed rules for Ro-Ro vessels, including wood sheathing for caterpillar trucks, drainage of cargo spaces, and calculations for structures subjected to wheeled loads.
Basis of Assessment	Discretion of the government registrar.	Prescriptive calculations, finite element analysis (FEA), and verification against established engineering formulas and standards.

3.2.3 Environmental Protection

While the ISO 1976 contains basic anti-pollution measures, it lacks the comprehensive and tiered approach to environmental management found in modern classification society rules.

Table 5: Comparison of Environmental Protection Regulations

Aspect	Inland Shipping Ordinance 1976	DNV, BV, and ABS
Core Requirement	Mandates an annual "pollution prevention certificate" and basic sanitation facilities.	Offer a range of voluntary, tiered environmental class notations (e.g., CLEAN, ENVIRO, ENVIRO+) that signify compliance beyond baseline international requirements.
Scope	Primarily addresses direct pollution (e.g., sewage, oily mixtures) into inland waters.	Covers a broad spectrum of environmental impacts, including air emissions (NOx, SOx), greenhouse gases (EEDI), anti-fouling systems, garbage management, and ballast water.
Compliance	Requires carrying the certificate on board.	Requires submission of detailed plans for fuel, sewage, garbage, and ballast systems for approval and verification through surveys.

3.2.4 Welding Process Evaluation

Welding is a critical process for ensuring the structural integrity of a vessel. The ISO 1976 is entirely silent on this subject, representing a central regulatory void.

Table 6: Comparison of Welding Process Evaluation

Aspect	Inland Shipping Ordinance 1976	DNV, BV, and ABS
Regulation	Not specified in the ordinance.	All three societies have extensive, dedicated chapters in their rulebooks for welding.
Scope	N/A	Rules cover welder qualification, welding procedure specifications (WPS), requirements for different materials (steel, aluminum), non-destructive testing (NDT) protocols, and standards for various joint types.
Oversight	N/A	Welding procedures must be approved by the classification society, and production welding is subject to inspection by class surveyors.

3.2.5 Safety Equipment

The ISO 1976 grants the power to regulate safety equipment but does not mandate a specific, detailed list within the ordinance itself, leaving a potential gap in standardized requirements.

Table 7: Comparison of Safety Equipment Regulations

Aspect	Inland Shipping Ordinance 1976	DNV, BV, and ABS
Requirement	Vaguely states the power to "make rules" for the "appliances and equipment to be carried on board" for safety.	Mandate specific, detailed lists of required safety equipment based on vessel type, size, and area of operation, directly referencing SOLAS and other international codes.
Scope	Not detailed.	Covers life-saving appliances (lifeboats, life rafts, lifejackets), fire protection and firefighting equipment (fixed systems, portable extinguishers), and navigational equipment.
Maintenance	Not specified.	Provide detailed requirements and schedules for the periodic inspection, testing, and maintenance of all safety equipment.

3.2.6 Stability

Vessel stability is paramount to preventing capsizing. The ISO 1976 addresses stability at the construction phase but lacks the detailed operational and damage-related criteria mandated by classification societies.

Table 8: Comparison of Stability Regulations

Aspect	Inland Shipping Ordinance 1976	DNV, BV, and ABS
Core Requirement	Mandates supervision and certification to ensure stability during a vessel's construction or modification.	Provide comprehensive rules covering both intact stability and damage stability.
Intact Stability	No specific criteria mentioned.	Prescribe detailed criteria for righting levers (GZ curves), metacentric height (GM), and weather criteria. Require an approved stability booklet on board.
Damage Stability	Not addressed.	Mandate calculations based on deterministic or probabilistic models to ensure the vessel can survive specified levels of hull damage and flooding, in line with SOLAS requirements.(Ariany, Santoso, et al. 2022)
Operational Tools	Not addressed.	Often requires an approved loading computer system on board to allow the crew to verify stability for any given loading condition.

3.2.7 Ballast Water Management

The management of ballast water is crucial for both stability and environmental protection. The ISO 1976 does not address this modern maritime issue.

Table 9: Comparison of Ballast Water Management Regulations

Aspect	**Inland Shipping Ordinance 1976**	**DNV, BV, and ABS**
Regulation	Not specified in the ordinance.	All three societies have detailed rules and guidelines aligned with the IMO's International Convention for the Control and Management of Ships' Ballast Water and Sediments (BWM Convention).
Scope	N/A	Rules cover requirements for Ballast Water Management Plans, ballast water exchange procedures, and technical standards for the design, type approval, and installation of Ballast Water Management Systems (BWMS).

3.2.8 Docking Analysis

Periodic drydocking is essential for underwater inspection and maintenance. The requirements for this process differ significantly in their technical depth.

Table 10: Comparison of Docking Analysis and Survey Regulations

Aspect	**Inland Shipping Ordinance 1976**	**DNV, BV, and ABS**
Purpose	Mentions a "docking survey" as a condition for extending the 30-year registration certificate.	Drydocking is a mandatory part of the survey cycle for class renewal, allowing for detailed inspection of the underwater hull and appendages.
Technical Guidance	No technical details provided for the analysis or survey.	Provide specific technical guidance for docking analysis (e.g., DNV's guidelines for FEA of docking loads) and exhaustive checklists for what must be inspected during a drydocking survey (e.g., hull plating, rudder, propeller, sea chests).

3.2.9 Survey Arrangement

The framework for vessel inspection throughout its life is a cornerstone of maritime safety. The ISO 1976 outlines an introductory registration survey, while classification societies mandate a continuous, lifelong cycle of rigorous inspections.

Table 11: Comparison of Survey Arrangements

Aspect	Inland Shipping Ordinance 1976	DNV, BV, and ABS
Framework	Primarily focuses on the initial survey for registration and a "special" survey for extending the certificate.	Mandate a comprehensive, lifelong survey regime.
Survey Cycle	Not a defined, continuous cycle.	Includes a mandatory cycle of **Annual Surveys**, **Intermediate Surveys** (at 2.5 years), and a comprehensive **Class Renewal Survey** (every 5 years), which provides fordrydocking.
Specialized Programs	Not available.	Offer specialized programs like the Enhanced Survey Program (ESP) for older tankers and bulk carriers, which require more intensive inspections of critical structural areas.
Oversight	Conducted by government surveyors.	Conducted by certified class society surveyors according to globally standardized procedures.

3.3 Critical Synthesis: Linking Regulatory Voids to the Amanat Shah Failure

The capsizing of the Amanat Shah serves as empirical evidence of the systemic vulnerabilities created by the ISO 1976. When the incident is analyzed through the lens of the nine safety domains identified in the comparative tables, it becomes clear that the disaster was a predictable outcome of regulatory lag:

- Structural Fatigue and Design Life (Domain 1 & 2): While Table 3 and Table 4 show that IACS standards (DNV/BV/ABS) mandate a 20–25 years fatigue life, the ISO 1976 allowed the Amanat Shah to operate for 41 years. The 'tiny holes' identified in the hull are classic symptoms of Fatigue Life Exhaustion, which international rules would have flagged for mandatory retirement a decade prior.
- Welding and Maintenance Voids (Domain 4): As seen in Table 6, the ISO 1976 is silent on welding. Consequently, the substandard welding used in the ferry's previous repairs was not legally required to undergo non-destructive testing (NDT), leading to a hull breach under stress.
- Stability and Ballast Management (Domain 6 & 7): The vessel's list of 11.43° prior to capsizing highlights the void in domestic Damage Stability requirements (Table 8). Unlike IACS standards, the ISO 1976 lacks the technical directives necessary for a crew to assess the 'Point of No Return' list angle.

4. Discussion

The comparative analysis reveals a significant contrast between Bangladesh's domestic regulations and modern international maritime safety standards. The ISO 1976 has remained static for decades, while classification society rules have evolved into advanced, evidence-based approaches. The sinking of the Amanat Shah was a predictable outcome of this regulatory environment. The vessel's operation at over 40 years of age, improper ballast management, and unaddressed stability issues directly correspond to the ISO 1976's permissiveness on service life extensions and no mention of modern stability criteria and ballast management. Its failed survey and maintenance record highlights the inadequacy of a system lacking the strict, periodic cycle of Annual, Intermediate, and Class Renewal surveys mandated by classification societies. Each major failure in the case directly leads to a specific gap where the ISO 1976 provides inadequate or no regulation compared to established international standards.

The application of this outdated ordinance can be understood through the concept of regulatory capture, where economic pressures from industry lead to the inactivity of safety rules (Park and Park 2017). The substantial cost of complying with modern standards for construction and maintenance creates an encouragement to maintain less strict requirements, effectively supporting the operation of older, less safe vessels at the expense of public safety.

This has created a dangerous two-tiered safety culture in Bangladesh. Vessels in international trade must abide by high, externally mandated standards (IMO 1974), while the domestic IWT fleet operates under much lower requirements of the ISO 1976. This difference implies that domestic passenger safety is valued less than global cargo efficiency and poses a strategic risk to the nation's "Blue Economy" ambitions (Emu and Hossain 2025). A major domestic ferry disaster can disrupt supply chains, sustain massive costs, and impose severe reputational damage, threatening the maritime goals the country is pursuing (ADB 2020). Modernizing domestic regulations is therefore not just a matter of social welfare but an urgent economic and strategic necessity.

4.1 Pathways for Regulatory Modernization

Addressing these systemic drawbacks requires a comprehensive legislative reformation, as the permissiveness of the current framework directly correlates with the observed operational failures. Since the ISO 1976 lacks prescriptive requirements for critical domains such as Welding Process Evaluation (Domain 4) and Damage Stability (Domain 6), the modernization pathway must shift toward a prescriptive technical code. Rather than developing standards in isolation, the new framework should formally adopt or adapt established international benchmarks, specifically the IMO Model Regulations on Domestic Ferry Safety(IMO 2024), supplemented by structural strength provisions from IACS members. This evidence-based approach leverages global maritime expertise to bridge the domestic regulatory divide identified in this study.

The transition toward complex IACS-level standards necessitates a corresponding upgrade in institutional capacity. The requirement for professional development is a direct consequence of the technical complexity inherent in modern reforms; a shift to Annual, Intermediate, and Class Renewal surveys requires a surveyor workforce at the Department of Shipping (DOS) specifically trained in advanced non-destructive testing (NDT), fatigue analysis, and digital stability verification. Consequently, modernization is a dual-track process where legislative updates are structurally dependent on the professionalization of regulatory oversight.

Long-term sustainability of these standards may benefit from building local technical capacity. A feasibility study should examine the potential for establishing a national classification society dedicated to inland vessels. Such an institution could develop regional expertise, generate high-skilled employment, and provide a sustainable mechanism for maintaining safety standards tailored to Bangladesh's unique IWT context.

Finally, learning from failures requires fundamental improvements in data transparency. Maritime accident investigations must be conducted by independent experts, with detailed technical analyses made publicly available (Kim and Lee 2017).. This transparency is essential for moving beyond 'regulatory capture' and building a safety culture that provides the high-quality data necessary for evidence-based policymaking (Zhang and Wang 2019). The current lack of transparency in accident reporting continues the regulatory stagnation identified in this study.

5. Conclusion

This study establishes that Bangladesh's continual IWT safety crisis arises from the outdatedness of the Inland Shipping Ordinance 1976. Through systematic comparative analysis across nine critical safety domains, the research demonstrates that the ISO 1976 is critically inadequate to international classification society standards. The Amanat Shah tragedy provides evidence of how outdated regulations directly enable catastrophic failures through improper age limitations, absent stability requirements, and insufficient survey protocols.

The findings reveal a two-tiered safety culture where domestic passenger safety is undervalued compared to international maritime standards. This gap carries not only humanitarian costs but also significant economic and strategic implications for Bangladesh's Blue Economy goals. The problem statement presented at the outset, understanding why ferry accidents continue despite the sector's economic importance, finds its answer in regulatory inaction driven by financial pressures favoring weaker supervision.

The technical pathways for improvement are well-established through international best practices. What remains is the institutional commitment to implement comprehensive legislative modernization, strengthen enforcement capacity, and prioritize domestic passenger safety with the strictness of standards for international vessels. The cost of continued inaction, measured in lives lost and economic disruption, definitely exceeds the resources required for practical improvements.

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