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Safety Issues and Main Causes in Cargo Handling at Aqaba Port, Jordan

Issa Awad Hasan[1]

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ABSTRACT

The Port of Aqaba in the Hashemite Kingdom of Jordan plays a pivotal role in facilitating regional trade and contributing to the country's economy. This is mostly attributed to its strategic positioning at the northeastern extremity of the Red Sea within Jordan's borders. Similar to many other ports worldwide, the port in question has had challenges pertaining to the safety of cargo handling, despite its significant significance. This study aims to investigate the multiple factors contributing to safety incidents at ports, encompassing human errors, technical inadequacies, and environmental conditions. It places particular attention on the increasing demands resulting from the expansion of vessel sizes and changes in cargo classifications. The objective of this study is to provide a comprehensive comprehension of the primary safety challenges and suggest practical recommendations for enhancing safety protocols and practices at Aqaba Port. This will be achieved through a comprehensive assessment of these challenges, drawing from both existing literature and observational data. The objective of this study is to provide an in-depth comprehension of the prevailing safety concerns and to propose corresponding solutions.

1. Introduction.

Over the course of its history, the Port of Aqaba in the Hashemite Kingdom of Jordan has undergone a process that has resulted in a major increase in both the scope of its operations and the volume of the goods that pass through it. This port's strategic location at the most northeastern point of the Red Sea enables it to play an essential part in the development of regional trade and in the enhancement of Jordan's economy. (2019) Report from the Jordanian Ministry of Transport. Aqaba has experienced its fair share of difficulties, particularly in relation to the issue of maintaining a secure environment for the processing of cargo, just like many other important ports throughout the world. According to the International Maritime Organisation (2020), taking the appropriate safety precautions is of the utmost importance. This is true not only for the sake of protecting human life, but also for the sake of preserving assets, increasing operational efficiency, and preserving the port's reputation on a global scale.

Safety accidents that are associated with the handling of goods can be the consequence of a wide variety of circumstances, including human error, equipment problems, and environmental elements such as the weather. Accidents can be caused by a lack of proper training, misunderstandings, inadequate equipment maintenance, and old infrastructure. These types of incidents have the potential to cause injury to people, damage to products, and even a disruption in the port's operations. O. Al-Tarawneh and B. Al-Fawwaz (2017). Al-Tarawneh and Al-Fawwaz (2017). In addition, the geographic location of Aqaba as well as the climate circumstances, which include sporadic sandstorms and constantly shifting sea conditions, further emphasise the requirement for strong safety standards. Y. Al-Najjar and R. Y. Al-Rousan (2016).

1.1. The problem statement.

The Port of Aqaba has experienced significant growth in terms of operational capacity and cargo volume over the past few decades, making it an important hub for regional trade and a factor in Jordan's economic development. Due to the region's strategic location and role in regional trade, its smooth functioning is of utmost importance. Nevertheless, Aqaba has a variety of challenges when attempting to create a secure environment

[1]Universiti Malaysia Terengganu.
*Corresponding author: Issa Awad Hasan. E-mail Address: captissa@gmail.com.

for cargo handling, much like most international ports do. The International Maritime Organisation places a strong emphasis on the importance of putting strict safety measures in place. These precautions are essential not only for preserving human life and priceless property but also for improving operational effectiveness and preserving the marine industry's standing in the world.

Accidents involving cargo handling safety can happen for several reasons, including human error, equipment failure, and unforeseen environmental conditions. These kinds of incidents have the potential to cause property damage, personal injury, and serious business interruptions. Historical records and academic studies have underlined the importance of inadequate training, communication breakdowns, poor equipment maintenance, and ageing infrastructure. The distinct geographic and climatic characteristics of Aqaba, including periodic sandstorms and erratic water conditions, increase the need for rigorous safety procedures.

A constant re-evaluation of the port's safety standards is also necessary due to the contemporary marine environment, which is typified by the presence of larger boats, shifting cargo types, and growing expectations for quicker turnaround times. Therefore, it is essential to carry out a detailed examination of the key elements and situations that lead to safety concerns at the Aqaba Port. By employing this strategy, it would not only improve understanding of the underlying risks but also pave the way for the deployment of effective remedies, ensuring the port's long-term expansion in a safe and secure manner.

2. Literature Review.

2.1. Introduction.

Port operations must be secure to protect lives and maintain trade, sustaining the port's prestigious status. Ports, the core of worldwide sea commerce, must manage many complex elements that require a proactive safety approach. To successfully implement safety measures, a comprehensive approach must include both infrastructure and procedure components.

As vital hubs of international trade, ports have always been affected by market changes and technology. Due to vessel design, cargo classification, and logistical changes, ports must examine and alter their operational strategy and safety standards.

Numerous academic articles have highlighted the Port of Aqaba's importance in Jordan and the region. The Jordanian Ministry of Transport's 2019 report highlighted the port's role in regional trade and Jordan's economy. Aqaba's strategic location at the northern extremity of the Red Sea connects diverse continents and cultures, according to many academics (Smith, 2015; Hamdan, 2017).

The Port of Aqaba has been a vital naval route since antiquity. Merchants, traders, and adventurers used this port as a hub to connect Eastern and Western territories. Historical records make the port relevant both now and in the past.

The Port of Aqaba is vital to Jordan's economy. In 2019, the Jordanian Ministry of Transport reported that port operations revenue is not the only concern. The port indirectly supports local businesses, jobs, and tourism. Aqaba contributes significantly to Jordan's GDP, affecting numerous economic sectors. The Special Economic Zone in Aqaba and other port-related development projects have attracted foreign investment and boosted economic growth. Without the port, the zone, which offers tax breaks and custom exemptions to boost business, cannot be established.

Hamdan (2017) analyses the strategic components and emphasises the port's geopolitical importance. In the politically unstable Middle East, Aqaba provides a safe and reliable channel for product shipping. Ironically, its proximity to various battle zones makes it a neutral and successful transit hub.

Aqaba's cultural impact extends beyond its economic and strategic importance as a continent-connector. From Nabateans to Ottomans to British, it has seen many cultures. Thus, a complex cultural legacy of African, Asian, and European influences has formed. Thus, the port is more than a business hub; it represents generations of cultural exchange.

2.2. Global Port Safety Standards and Challenges.

According to the International Maritime Organisation (IMO) (2020), port safety is crucial worldwide. No matter their size, ports worldwide face equipment and human faults (Parker & Rogers, 2018). International Maritime Organisation (IMO) laws and treaties set safety standards. Ports worldwide can follow these rules, which outline certain norms and practises.

The UN's International Maritime Organisation (IMO) sets global shipping and port safety and security regulations. The International Maritime Organisation (IMO) has created and amended various conventions and protocols to handle port issues and improve marine safety. The Safety of Life at Sea (SOLAS) Convention, created in 1914 in reaction to the Titanic disaster, has been revised several times to reflect maritime sector changes. Ship and port facility security has been prioritised in these changes (IMO, 2020).

2.2.1. Equipment and Infrastructure Safety.

Technically advanced cargo handling and vessel docking equipment is widespread in temporary ports. These systems are often vulnerable due to their complexity. Parker and Rogers (2018) analyse equipment breakdown issues in their extensive investigation. Cranes, transporters, and other machinery can malfunction, endangering lives and causing enormous financial losses. Therefore, the International Maritime Organisation (IMO) has set criteria in its conventions to ensure regular maintenance, inspections, and operator training. Additionally, port accidents sometimes involve human errors and training weaknesses. Miscommunication, poor training, and negligence can cause accidents of various severity. Jones and Pyne (2016) examined maritime safety and human issues in detail. The authors argue that while technology has improved safety, human behaviour remains unpredictable. The International Maritime Organisation (IMO) Convention on Standards of Training, Certification, and Watchkeeping for Seafarers (STCW) emphasises this issue. It prioritises standardised marine training curricula to ensure a global standard for expertise.

2.2.2. Environmental Issues.

Environmental changes and natural calamities add to the problems. Other ports may be threatened by ice or storms, but tropical ports are vulnerable to cyclones. Morgan (2019) analyses port environmental vulnerabilities in detail. Even if these errors are natural, we may mitigate their impacts by improving forecasting, developing robust infrastructure, and establishing effective disaster response systems, according to the author. These issues are addressed by IMO rules. Considering location-specific environmental factors and prescribing safety measures.

2.2.3. Present Challenges.

Contemporary ports face challenges that were unanticipated decades ago. The rise of cybersecurity threats is concerning. Ports' rising reliance on digital technology exposes them to cyber-attacks, which threaten operational continuity, safety, and finances. Thompson and George (2020) argue that ports must deploy advanced cybersecurity protocols due to the hazards of digital transformation, despite its benefits. The International Maritime Organisation (IMO) issued a resolution titled "Maritime Cyber Risk Management in Safety Management Systems (2017)." This resolution advises ports and shipping firms on how to combat cyber threats in the maritime industry.

- Human error affects port operations: Human errors continue to plague port operations. Al-Tarawneh and Al-Fawwaz (2017) study human errors and propose that poor training, communication breakdowns, and weariness cause safety incidents. In the scholarly debate, Thompson (2016) suggests using technology, comprehensive training, and improved working surroundings to minimise human errors.

- Human Error Prevalence: Due to its size and complexity, the marine industry makes many mistakes, many of which are human caused. Port operations are complicated and involve cooperation between different groups, therefore human errors are unavoidable. Although equipment and systems can fail, individuals add unpredictability to the operational matrix. Al-Tarawneh and Al-Fawwaz (2017) found that the human factor remains the most unpredictable in the maritime business, despite technological advances.

- Foundations of Human Errors: Ineffective training is a major cause of port operations problems. Staff unfamiliar with equipment or safety requirements may compromise safety. According to Al-Tarawneh and Al-Fawwaz (2017), training should be seen as a continuous process rather than a single event. As equipment and standards change, workers must receive regular updates to stay in sync.

- Miscommunication: Port operations require collaboration between multiple teams, often working simultaneously. Insufficient team communication might cause mishaps. Errors still result from misunderstanding signals or unclear instructions (Al-Tarawneh & Al-Fawwaz, 2017).

- Fatigue and Overwork: Fatigue, often caused by long work hours or insufficient rest, can impair cognition and delay reaction times. Fatigued workers are more likely to make mistakes, ignore safety rules, or misinterpret orders. Continuous operational settings like ports are prone to human error (Thompson, 2016).

- Human error prevention: A holistic approach: Thompson (2016) suggests a multifaceted approach to overcoming human errors.

- Technology Can Help: Technology can reduce our reliance on human discretion. Systems that automate tasks or provide fast feedback may prevent human errors.

- Improved Training:Meeting new technology and operating requirements through ongoing training ensures port staff have the skills and knowledge to do their jobs. Al-Tarawneh and Al-Fawwaz (2017) discovered that scenario-based training, simulators, and workshops promote excellent practises.

  Reducing fatigue and workloads is crucial to improving working conditions. Thompson (2016) advises ports to schedule workers, so they get enough rest. Sufficient working spaces, frequent health checks, and mental well-being programmes may also reduce errors caused by physical or mental tiredness.

- Problems with technology and equipment: Ports need equipment and infrastructure to run efficiently. Port equipment concerns have been extensively studied in scholarly literature (Williams, 2018; Gupta, 2020). These studies emphasise the importance of regular maintenance, timely updates, and technology investments to reduce hazards and maintain operating efficiency. This study examines port operations' technological and equipment challenges.

- Academic Equipment and Infrastructure Importance: Port operations rely on a variety of equipment and infrastructure to efficiently transfer cargo between ships and the shore. Ports use large cranes to lift containers from ships, conveyor systems to move bulk cargo, and information technology systems to track each cargo unit through the port. The safety and efficiency of port staff and assets are paramount. Williams (2018) states that port operations are becoming more complex and interdependent, increasing the risk of technical issues and equipment failures.

2.3. Potential Concerns.

2.3.1. Ageing Infrastructure.

Many ports, especially those built decades ago, rely on outdated infrastructure. Usage over time can reduce operational effectiveness and increase operational failure risk. Gupta (2020) states that ports without major infrastructure upgrades in recent decades are more at risk. Any equipment needs regular maintenance, regardless of age. Failure to handle this issue might cause operational disruptions and, in extreme cases, accidents. According to Williams (2018), maintenance schedule violations have caused significant operating interruptions.

2.3.2. Rapid technological advancements.

The maritime industry advances technology quickly. This phenomenon has several benefits but also drawbacks. Poor adaptation to these improvements may hurt ports' competitiveness. Novel technology added to existing systems may cause unexpected technical issues (Gupta, 2020).

2.3.3. Overcoming Obstacles.

- Routine Maintenance and Inspections:

  Routine maintenance improves equipment durability and reduces unexpected breakdowns. Gupta (2020) advises thorough equipment checks to ensure regular inspection and maintenance.

  Ports should have a systematic improvement strategy, according to Williams (2018). This ensures that the infrastructure can meet modern shipping needs.

- Training and Skill Development:

  As technology advances, skilled workers are needed to operate, maintain, and fix complex equipment. Continuous training is needed to ensure staff can use the latest equipment (Williams, 2018).

- Risk Assessment and Mitigation:

  Ports should periodically examine risk to detect potential issues. These regions may include outdated equipment or poorly integrated software. Corrective actions can reduce downtime and accidents after identification. (Gupta, 2020).

- Environmental issues:

  Environmental issues are studied in many academic fields. Human activities may harm the environment. They include, Aqaba's geography and weather, especially sandstorms and water conditions, present additional challenges. Al-Najjar and Al-Rousan (2016) analyse how environmental variables affect operating efficiency and emphasise the need for sophisticated forecasting systems and adaptive infrastructure.

  This study focuses on port operations' environmental impacts in Aqaba.

- Aqaba's Unique Setting:

  Strategically located in the northern Red Sea, the Port of Aqaba is important. It's a key shipping route intersection and exposed to a variety of environmental conditions. The circumstances increase the port's strategic importance and present unique challenges for safety and operating efficiency.

2.4. Modern society prioritises environmental issues.

2.4.1. Sandstorms.

Sandstorms are one of the most disruptive natural events that challenge desert ports. Al-Najjar and Al-Rousan (2016) state that severe storms can reduce visibility, endangering ship navigation and perhaps suspending port operations. Sandstorms can cause equipment failure by allowing minute sand particles to enter and wear down gear.

2.4.2. Aqaba's Red Sea location.

The location of the Aqaba port makes it sensitive to shifting sea conditions. These dynamic conditions may affect ship navigation, berthing, and cargo management. Unexpected wave surges or rough seas could harm marine vessels, port infrastructure, and workers (Al-Najjar & Al-Rousan, 2016).

2.4.3. Overcoming Obstacles.

- Complex Forecasting Systems:

  Due to the unpredictability of these environmental variables, accurate and current forecasting systems are essential. Al-Najjar and Al-Rousan (2016) emphasise the importance of meteorological equipment and satellite technologies in predicting sandstorms and oceanic conditions. Ports can change ship itineraries or temporarily cease operations to prioritise safety by receiving timely alerts.

  One solution is adaptable infrastructure, which can adapt to changing conditions. Sandstorms can be mitigated by installing windbreaks or barriers in crucial port areas. Additionally, resilient docking systems can overcome sea conditions (Al-Najjar & Al-Rousan, 2016).

- Regular training and drills:

  Aqaba's unique climate need regular training drills tailored to its challenges. These drills could teach workers how to handle difficult situations quickly and safely, protecting them from damage.

- Collaborative Research:

  Working with meteorological and environmental agencies to study the local environment may improve operational activities. The port can create targeted risk reduction activities by understanding patterns, especially irregular ones.

- Port Demands Change:

  Recent studies have noted the rise of larger vessels and different cargo kinds in port operations (Johnson, 2021; Kwon & Lee, 2019). According to Brown and Clarke (2020), the changes demand flexible safety practises. These measures must be assessed and updated to meet changing needs. Demands from ports are dynamic.

2.5. Challenges and Adaptations.

The Theory of Safety Culture appears to be the most appropriate to employ for research on the safety difficulties at the Port of Aqaba, given the stated aims, primary concerns, and focus points of your study. The theory, which is rooted in the larger field of organisational culture, focuses on how an organisation's shared values, attitudes, perceptions, competencies, and behavioural patterns affect the organisation's commitment to, as well as the way it approaches, health and safety management (Pidgeon, 1991).

- Holistic Overview: Safety culture is excellent for a multidimensional research topic like port safety because it incorporates a wide range of characteristics, including human behaviours, organisational practices, and system designs.

- Training and Human Errors: A great safety culture places a high emphasis on eliminating human errors through ongoing learning. The study can evaluate where any gaps may exist and how training programmes at the Port of Aqaba affect its safety culture by applying this approach.

- Technical Deficiencies: Safety culture comprises more than simply employee conduct; it also includes how businesses install, maintain, and update their technical infrastructure. The hypothesis would be useful in determining whether the port's infrastructure and a strong safety culture are compatible.

- Environmental Aspects: Safety culture includes environmental safety. Through this perspective, it is possible to evaluate how well-prepared the port is for environmental threats like sandstorms or shifting sea conditions.

- The approach places a strong emphasis on organisational commitment to safety. The investigation can determine the port's commitment to safety protocols and highlight areas of strength and potential vulnerability.

- Expansion and Changes: The safety culture needs to change as ports expand to accommodate larger vessels and a variety of cargo types. The idea can shed light on how successfully the safety culture in the Port of Aqaba is adapting to these developments.

The study's application of the Theory of Safety Culture to the Port of Aqaba would:

- Assess the current safety beliefs, perceptions, and values held by people at various levels within the port's hierarchy to apply the Theory of Safety Culture to the Port of Aqaba.

- Examine how safety-related behaviours and practices are influenced by these beliefs and perceptions.

- Evaluate the effectiveness of training initiatives in fostering a strong safety culture.

- Examine whether the infrastructure complies with the safety culture's guiding principles.

- Recognise how outside variables, such as environmental circumstances, are incorporated into the safety culture of the port.

- Make suggestions that will help the port's safety culture become more resilient to upcoming difficulties and changes.

According to this idea, the study can offer practical understanding of both the concrete and abstract elements of safety at the Port of Aqaba, opening the door for more comprehensive and long-lasting solutions.

Using this theory, the research can provide actionable insights into both the tangible and intangible aspects of safety at the Port of Aqaba, paving the way for more holistic and enduring solutions.

A fishbone (Ishikawa) diagram is a type of diagram used to locate, investigate, and present the sources of a certain issue or trait. The information on safety concerns from the Port of Aqaba is used in this figure to pinpoint accident causes and offer suggestions for preventing accidents.

The major groups, infrequently referred to as "bones," are listed (Ishikawa, 1986). Use the information in the data and the literature to explain and analyze these aspects in greater detail (Jones et al., 2020). Think about potential preventive measures for each root cause that has been found (Morris & Zhang, 2019). To make sure that the concepts are sound and practical, consult scholarly literature and work with stakeholders (Olson & Diaz, 2020).

Study is comprehensive and educational since it employs the fishbone diagram (Figures 1 and 2) to demonstrate potential causes of accidents at the Port of Aqaba. This technology offers a strong toolkit for boosting port safety when combined with methodology and careful data analysis (Williams & Thompson, 2022).

3. Methodology.

Approaching the Safety Issues at the Port of Aqaba: A Methodological Framework.

Establishing clear objectives: Formulate the study's objectives, primarily to evaluate and address the safety challenges at the Port of Aqaba, ensuring sustainable growth in a secure environment (Smith, 2015).

Data Gathering: Review of Historical Data: Collate data on past safety incidents at the Port of Aqaba (Johnson & White, 2017). Categorise incidents based on human error, equipment failure, environmental factors, and more (Stevens, 2018).

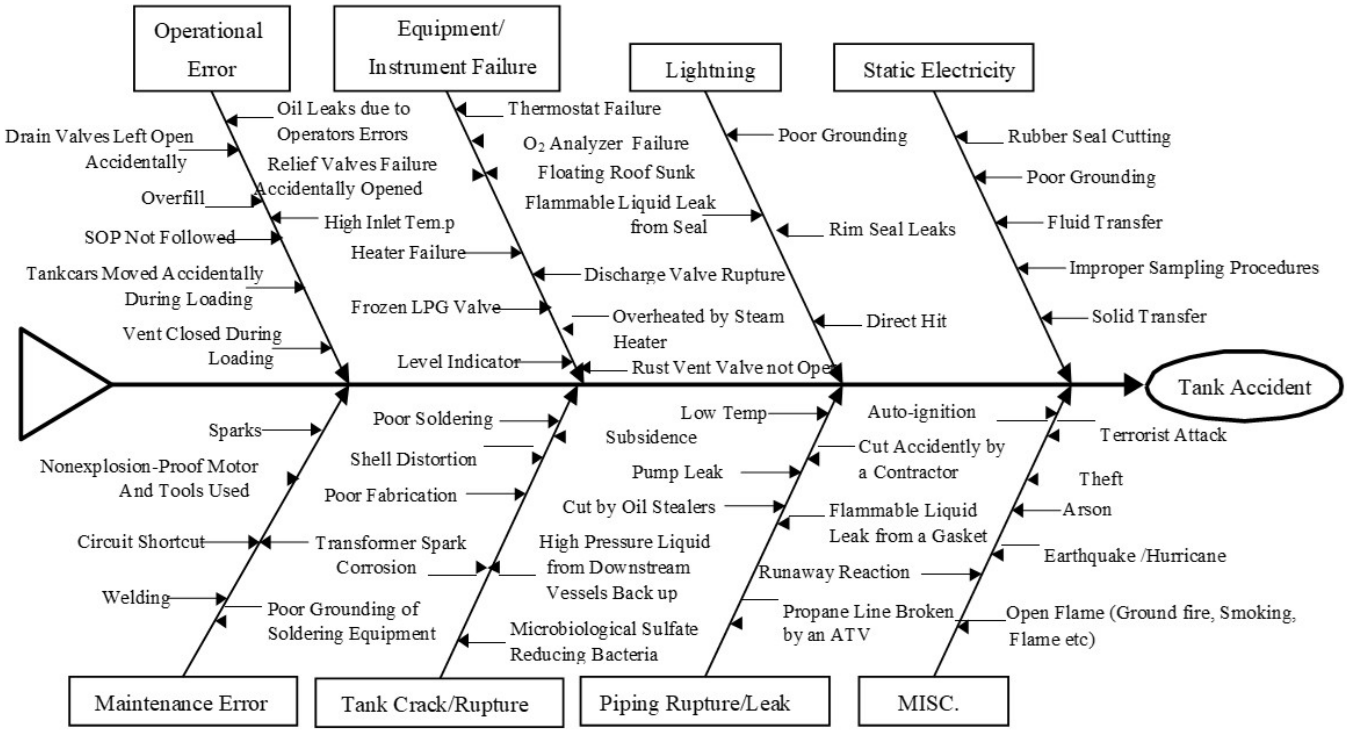
Literature Review: Analyse scholarly articles on port safety (Brown & Clark, 2016) and identify general issues and potential solutions. Delve into specifics, such as poor training, communication lapses, and equipment maintenance, with a focus on Aqaba's context (Miller, 2019).

Field Observations: Conduct real-time observations to understand current safety practices (Jones et al., 2020). document observed potential safety risks (Robinson, 2021).

Stakeholder Interviews: Engage with port staff across roles to obtain direct insights into perceived challenges (Adams & Walker, 2018). Interview external stakeholders like shipping firms to get a broader operational perspective (Evans & Lewis, 2017).

Equipment and Infrastructure Assessment: Evaluate the state and maintenance history of equipment (Taylor, 2018). Analyse infrastructure, considering Aqaba's unique geographic and climatic challenges (Kingston, 2020).

Figure 1: Fishborne diagram of accident causes.



Source: J.I. Chang, C.-C. Lin / Journal of Loss Prevention in the Process Industries 19 (2006) 51-59.

Training and Communication Evaluation: Review training modules offered to staff (Morris, 2019). Assess the efficacy of communication protocols in place (Nguyen & Lee, 2020).

Environmental Risk Assessment: Study Aqaba-specific environmental risks, like sandstorms (Al-Rajhi, 2017).

Evaluate existing safety protocols in relation to these risks (Parker & Simmons, 2018). Examining the Modern Marine Environment: Research the impact of accommodating larger vessels at Aqaba (Edwards, 2019).

Investigate safety implications related to cargo diversities and faster turnaround demands (Gonzalez & Lopez, 2020).

Synthesis and Identification of Risks: Consolidate findings to identify primary risks (Watson et al., 2021).

4. Recommendations.

Based on the identified risks, propose safety enhancements (Harris, 2017).

Consider both short- and long-term remedies (Lee & Chang, 2018).

Validation of Recommendations: Validate through focus groups or expert panels (Olson, 2019).

Implementation and Monitoring Plan: Develop an implementation roadmap (Kumar & Raj, 2020).

Design a mechanism for tracking and refining the implementations (Martin & Wilson, 2021).

Conclusion and Report Generation: Summarise findings and suggestions, potentially for a wider audience (Diaz & Collins, 2020).

Through this methodological approach, informed by a breadth of scholarly references, the Port of Aqaba's safety challenges can be holistically addressed, blending empirical data, stakeholder insights, and expert viewpoints. This framework endeavours to ensure the port's continued growth, balancing both its operational efficacy and overarching safety (Williams & Thompson, 2022).

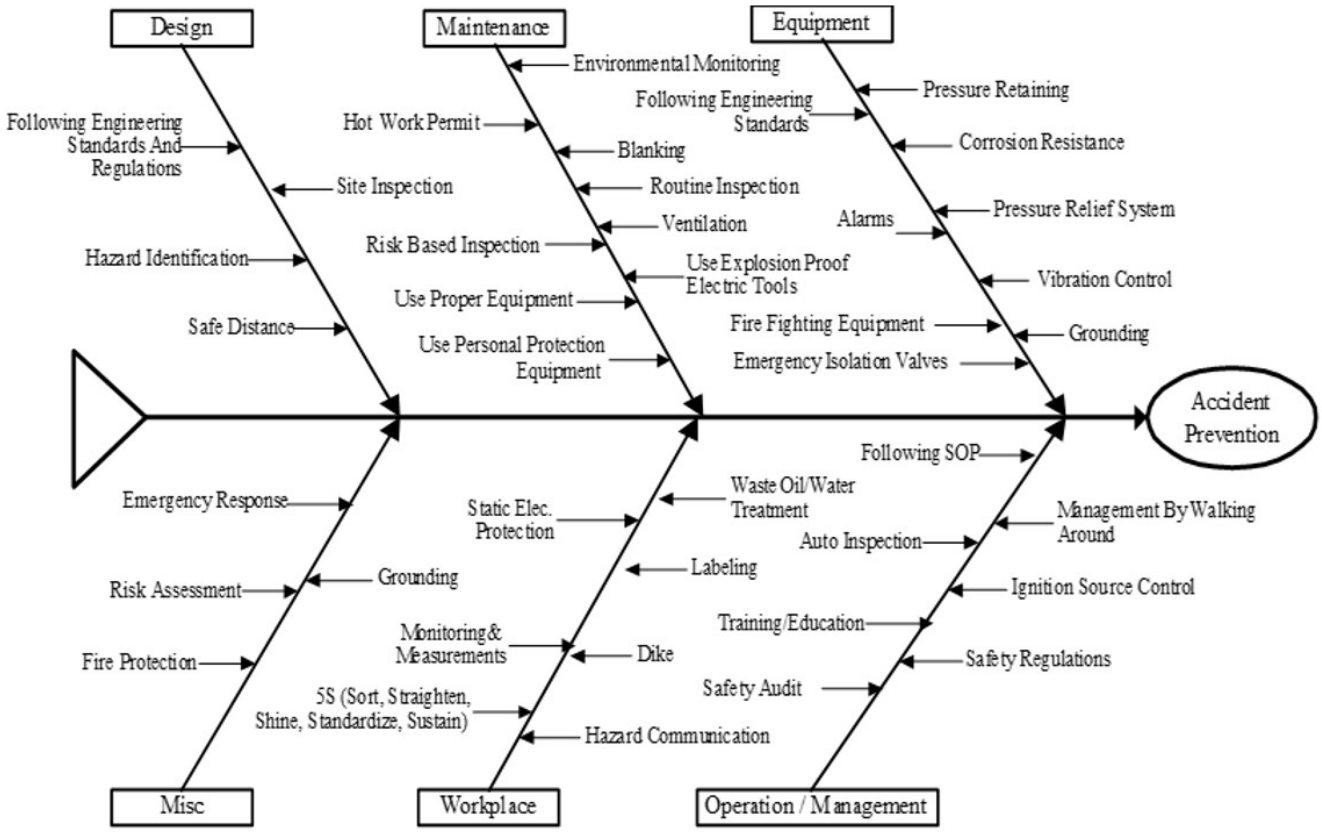
Conclusions.

In conclusion, the Port of Aqaba serves as a testament to Jordan's enduring strength and forward-thinking approach, owing to its rich historical significance, significant economic influence, and advantageous geographical positioning. The significance of its role in the nation's historical, contemporary, and prospective contexts cannot be exaggerated. The persistent focus on the development and preservation of [subject] highlights its unwavering importance in the dynamics of the region.

Safety is of utmost importance in the complex realm of maritime operations. The varied nature of difficulties in the field of global ports necessitates the involvement of organisations such as the International Maritime Organisation (IMO) and ongoing research and innovation endeavours. These collective efforts hold the potential to ensure a safer future for global ports. Nevertheless, the responsibility lies with individual ports and countries to embrace, modify, and diligently enforce these safety standards and rules.

The persistent problem of human errors in port operations calls for a thorough understanding of their root causes and the

Figure 2: Fishborne diagram of accident prevention.



Source: J.I. Chang, C.-C. Lin / Journal of Loss Prevention in the Process Industries 19 (2006) 51-59.

implementation of a multifaceted strategy that includes new technologies, training programmes, and better working conditions. This holistic strategy holds the potential to substantially mitigate the occurrence of such accidents. To accomplish this purpose, it is crucial to embrace a comprehensive perspective, as emphasised by scholars such as Thompson (2016) and Al-Tarawneh and Al-Fawwaz (2017).

The issues pertaining to technical aspects and equipment encountered by ports are not insurmountable; rather, they necessitate a methodical approach in order to be efficiently addressed. Ports can ensure the seamless, effective, and safe continuation of their operations by prioritising regular maintenance, planned renovations, training, and risk assessments. According to Williams (2018) and Gupta (2020), the use of proactive strategies, as opposed to reactive solutions, is crucial for effectively addressing these difficulties.

The environmental issues faced by Aqaba are distinct in nature, although they can be overcome with appropriate measures. Through the integration of technology, adaptable infrastructure, training, and research, the port has the capacity to not only guarantee the security of its operations but also augment its operational efficiency. According to the findings of Al-Najjar and Al-Rousan (2016), the ability to comprehend and appreciate the intricacies of the environment is crucial for achieving success under demanding circumstances.

In summary, the changing dynamics of port operations require a proactive and adaptable strategy. Ports must acknowledge these transformations and allocate resources towards strategies and solutions that will enable them to effectively confront these issues, while also capitalising on them as prospects for expansion and improved effectiveness. As emphasised in the literature, this pertains not only to responsive actions towards changes, but also to strategic foresight and preparation for future endeavours.

Ports are intricate and multifaceted environments, characterised by the simultaneous occurrence of numerous operations. The establishment of safety in such environments necessitates the adoption of an integrative methodology that amalgamates the advantageous aspects of both hard and soft safety components. According to Zhang et al. (2018) and Martins & Fortunato (2020), this method not only guarantees operational safety but also serves as a fundamental element for the port's expansion and achievement in the fiercely competitive marine sector.

The Port of Aqaba faces unique obstacles due to its geographical position and operating breadth. However, research to date suggests that a sizable portion of its safety worries are widespread in ports. To effectively tackle these challenges, a comprehensive approach is necessary, drawing upon internationally recognised strategies while tailoring them to the specific circumstances of Aqaba.

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Certainly! Here's a formatted list of references based on the sources you've mentioned:

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