



Satakunnan ammattikorkeakoulu  
Satakunta University of Applied Sciences

ELIAS HAUNAWA

# **Investigating business opportuni- ties in Africa**

DEGREE PROGRAMME IN MARINE ENGINEERING  
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## ABSTRACT

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This bachelor's thesis was commissioned by Kongsberg Maritime, one of the global players in aftermarket services for propulsions and deck machinery in the maritime industry. The thesis focus is on deck machinery products i.e., Anchoring, mooring and towing winches (AMT). The author of this thesis worked as a spare parts sales engineer trainee at Kongsberg Maritime Finland Oy during summer 2023.

The purpose of this thesis was to explore the current situation perceived by Kongsberg Maritime aftermarket services affecting their customers in Africa. The second objective of this thesis was to find out how Kongsberg Maritime can expand to other parts of Africa rather than the southern part only. This study utilized a case study technique and a qualitative research method. Interviews and discussions with Kongsberg Maritime team members were conducted to gather data for the case study section. Responsible persons at Kongsberg Maritime service facilities in Africa were also interviewed.

In empirical part of this thesis, the research present findings about the current situation on what affects aftermarket business in Africa perceived by Kongsberg Maritime aftermarket service team. It also present findings on the recommended suitable trading spots in Africa. Discussions and conclusion include recommendations and ideas for improvement.

Keywords: Aftermarket services, Kongsberg Maritime, Africa continent, Ship building, Ship repair, Major seaport, Vessel registry, Fleet owners

## FOREWORD

I would like to thank my academic thesis supervisor Jarno Laine, for guidance and making sure that my thesis is academic fit. Also, by sharing his experience about Namibia's maritime industry played an important role in my thesis.

Extra gratitude goes to my case company supervisor Oili Reunamäki, for showing interest and investing her time in my work, for sharing her experiences and opinions during my thesis. Under her supervision I was able to host interviews and connect to the right people that provided me with information that I ever needed to complete my thesis. The openness of the interview participants offered an immense amount of information based on their personal experiences.

I'm deeply grateful for the support!

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## 1. INTRODUCTION

The aftermarket sector of a company is a prospective source of revenue. These are the goods and services that are either purchased in addition to the main product or that are used with it. Since the demand for the original product also creates a need for aftermarket, more businesses are growing interested in aftermarket's potential as a source of growth (Agrawal, & Cohen, 2006, p. 67-69.)

According to McKinsey & Company (2015, p. 45), it has been shown that to increase company performance and profitability, it necessitates the use of a strategic approach to fully realize the potential of the aftermarket industry. With this market segment serving as one of the main drivers of a company's growth, having an aftermarket strategy gives a business a direction for the future. Kongsberg Maritime needs to investigate approaches for taking advantage of this aftermarket services opportunity in Africa because aftermarket business has the potential for growth.

End users in industrial markets are active in commercial activities and suffer financial losses from day-to-day company operations when a product malfunctions. Therefore, aftermarket support and services are crucial for customer. It is vital to support customers over the whole lifecycle of the product. If customers don't believe that they will get service and support in future, purchasing the primary product might not be convincing to them (Shapiro & Teece, 1995, p. 111-113.)

With rapidly expanding economies that draw an increasing amount of shipping traffic and a robust offshore oil & gas industry, there is an ocean of opportunities in the continent. Therefore, there might be opportunities for Kongsberg Maritime deck machinery (Anchoring, Mooring and Towing winches, AMT) in Africa. It is therefore quite interesting for Kongsberg Maritime to expand their facilities within this region. It might be a significant move for Kongsberg Maritime in extending its global reach, particularly in this continent of Africa. It will

lead to a stronger cooperation for Kongsberg Maritime and their customers over the next years as African maritime industry continues to shoot up within the continent at large. It will create a smooth system for providing sales support and customer service, and staff can effectively assist customers using the expanded Kongsberg Maritime product lines within Africa sub-continent. This bachelor's thesis focuses on aftermarket for Kongsberg Maritime deck machinery products Anchoring mooring and Towing winches (AMT).

### 1.1 Problem Area

The company's profitability is largely dependent on the aftermarket. It is therefore a part that this thesis will highlight as a key component. The case company may benefit if it chooses to increase aftermarket business in the region by extending its service facilities to other regions of Africa. Over Fifteen significant seaports in Africa have dry dock facilities, and the majority of them would rather have ship repair and shipyard facilities on their premises. Additionally, the majority of these ports function as entry points into the global network of maritime transportation. Note that where there are ship repair facilities, there is a need for aftermarket services as well.

### 1.2 Research Problem

The main research topic of the thesis came as a result from a discussion between the researcher and his manager. It was decided that the study would focus on identifying business opportunities in Africa as well as the type of difficulties encountered when providing aftermarket services in the Africa. The design process includes developing the objectives of the study and research questions.

Main topic of the research:

What are the business opportunities in Africa?



### 1.3 Research Questions

The study aims to focus on two different areas: The first area of study is about aftermarket services; the researcher wants to understand how aftermarket services are carried out in Africa. The second area of study, the researcher aims to investigate business opportunities in Africa's maritime industry. Therefore, the study asks the following questions in table 1 during the research.

Table 1. Research questions

<ol style="list-style-type: none"><li>1. What do customers value in the aftermarket?</li><li>2. What factors to consider if Kongsberg Maritime plans to expand in Africa?</li><li>3. What challenges Kongsberg Maritime is facing when conducting aftermarket services in Africa?</li></ol>

### 1.4 Conceptual Framework

A conceptual framework is at the centre of an empirical study. The conceptual framework serves as a guide and ballast to the research (Ravitch & Riggan, 2016), functioning as an integrating ecosystem that help researchers intentionally bring all aspects of the study together through a process that explicates their connections and the contexts shaping research sitting and the study of phenomena in that setting.

The interactive components of a conceptual framework for this research are shown in figure 1.

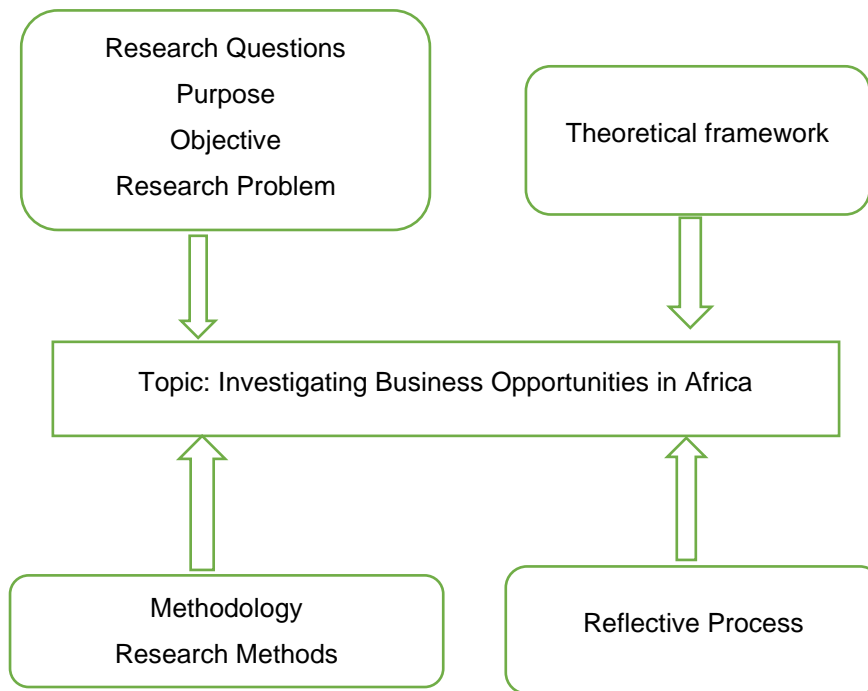


Figure 1. Conceptual framework for the research.

### 1.5 Definition of key terms

**Aftermarket:** According to Shapiro & Teece (1995, p. 39-135), the aftermarket is defined as products or services used in conjunction with the primary product or purchased after purchasing the primary product. According to Agrawal, Agrawal, & Cohen (2006, p. 45-46), it is also referred to as after-sales items or services.

**Deck Machinery:** Vessel deck equipment is another name for deck machineries that are fitted all around the deck of the vessel from fore to aft. These are type of mechanical equipment's located on the ship's deck and serves as an integral part of the vessel. For a ship to dock, to berth, to stand still in the middle of the sea and for towing purposes, deck machineries are crucial pieces of mechanical equipment to do all this. This can guarantee vessels to operate safely. The primary ship deck machinery equipment's are the anchor windlass, mooring winches, mooring bollard, and towing winches (Lau, 2018, p. 2.)

**Spare part:** Denotes a part, sub-assembly, or assembly for replacement that is prepared to replace a part, sub-assembly, or assembly that includes a

component or an accessory and is identical to or comparable to that part, sub-assembly, or assembly (Lau, 2018, p. 2.)

## 1.6 Why Africa

To support its intercontinental trade, Africa primarily depends on ships and ports. Africa's marine sector reflects the continent's low level of commercial integration, but this also heralds a huge opportunity for the second youngest and most populous continent in the world. While the continent only contributes 2.7% of global trade in terms of value, it accounts for 7% and 5%, respectively, of maritime exports and imports in terms of volume. Even though one-third of African nations are landlocked, shipping is still the principal method of accessing the world market (UNCTAD website, 2022.)

There are over 20 seaports around Africa. One of the most significant worldwide maritime channel travels through Africa. The Cape of Good Hope (Southern tip of Africa) is a major passageway between the Atlantic and Indian Oceans. Suez Canal is one of the busiest trade routes connecting Mediterranean Sea to the Red Sea and dividing Africa and from the Arabic world. The Suez Canal Zone delivers a competitive economic advantage as it connects about 1.6 billion consumers across Europe, Asia, and Africa. More than 90% of all imports and exports in Africa are handled by sea through ports along the coast, despite the continent's own marine transport sector still being relatively underdeveloped (UNCTAD website, 2022.)

Additionally, one of the biggest shipping registries in the world is in Africa. About 11% of the global seagoing fleet is covered by the Liberian Registry. The oldest fleets of bulkers, container ships, and oil tankers are in Africa. There are few fleet owners in Africa. Despite decades of efforts to boost African participation in the provision of maritime services, the continent continues to rely primarily on ships that are owned by foreigners. The low trade diversification and trade concentration of Africa influence maritime trade. Accordingly, crude oil accounted for 40% of items exported by sea in 2017, while dry cargoes (dry

bulks and containerized goods) accounted for almost two thirds of imports and petroleum products and gas made up close to 20% of imports (UNCTAD website, 2022.)

Despite its trade share falling from roughly 50% in 1995 to one-third in 2017, the European Union remains Africa's principal commercial partner. China and Asia in general have gradually reduced the EU and US share of African commerce, while trade with China has expanded in recent years. This is due to a decline in trade with the United States of America and an increase in trade with China. This is creating new prospects for the continent as a consumer market as well as a prospective manufacturing zone, as evidenced by Ethiopia's expanding textile and apparel industry, for instance (UNCTAD website, 2022.)

## 2. INTRODUCTION TO THE CASE COMPANY

### 2.1 Kongsberg

Kongsberg is a global technology powerhouse company that offers cutting-edge and dependable solutions to raise performance, safety, and security in difficult situations and complex operations. Kongsberg serves discerning clients in three main key business areas, Kongsberg Maritime, Kongsberg Digital and Kongsberg defence & aerospace. The fourth key business area is Sensors and Robotics as of 2023 will be separated from Kongsberg Maritime and will be established as a separate business area (Kongsberg Maritime website, 2023.)

Kongsberg provides their clients in the maritime, energy, defence, space, and other sectors with strategically significant solutions through their business areas.

Kongsberg defence & aerospace present in 16 countries with over 3700 employees is a global technology leader and a leading supplier within defence, surveillance, space and aerostructures.

Kongsberg Digital present in 8 countries with over 900 employees is an industrial software company shaping the future for work by changing how businesses are design, operate and maintain their assets.

Kongsberg Maritime present in 32 countries with over 7000 employees provides the technology, equipment and aftermarket services required to operate at sea in the most sustainable way (Kongsberg Maritime website, 2023.)

Kongsberg Maritime has the broadest portfolio of products for the maritime industry. Kongsberg Maritime is the largest business area for Kongsberg with their products on over 33000 vessels worldwide. Kongsberg Maritime is further divided into five divisions which are, Integrated solutions, Global customer support, Propulsion & Engines, Sensors & Robotics and Deck machinery & Motion control (Kongsberg Maritime website, 2023.)

This business area of Kongsberg will be the focus of the entire thesis.

## 2.2 Integrated solutions division

Regarding dynamic positioning, propulsion control, automation, bridge systems, electric and digital solutions, Kongsberg Maritime offers products that are both market leaders and innovators. This serves as the foundation for a variety of integrated solutions. Customers benefit from seamless integration of mission-critical products and systems, which gives Kongsberg Maritime and their clients an edge over the competition. Increased operational effectiveness, safety, and sustainability are just a few of the substantial advantages that Kongsberg Maritime integrated solutions offer (Kongsberg Maritime website, 2023.)

## 2.3 Global customer support division

Through a global network of more than a thousand service engineers, technical support, the delivery of spare parts, and modifications to sailing vessels,

Global Customer Support provides assistance to marine customers across the world (Kongsberg Maritime website, 2023.)

#### 2.4 Propulsion & Engines division

Kongsberg Maritime is one of the global leaders in providing propulsion systems. The product categories include propellers, rudders, thrusters, including electrical PODs, waterjets, as well as entire propulsion and manoeuvring systems for offshore, commercial, and defence applications. Products provided by Propulsion & Engines are adaptable to greener and emission-free fuels, high efficiency, electrification, and low noise technologies. The division's technological team is made up of top professionals from around the world in the fields of hydrodynamics, material technology, and a team focused on cutting-edge electrical propulsion employing permanent magnets (Kongsberg Maritime website, 2023.)

#### 2.5 Sensors and Robotics division

Kongsberg Maritime has portfolio of sensors and sensor systems that are needed to map, monitor, and comprehend the environmental conditions and values of the ocean space. This helps ensure the safe and reliable operation of vessels that operate above and below the ocean surface. Solutions for communication above and below water are also included in the portfolio. A variety of robotized platforms are available from Sensors & Robotics, including the autonomous underwater vehicle (AUV) HUGIN. Kongsberg Maritime sensors can access even the most inaccessible and far-off regions of the ocean space (Kongsberg Maritime website, 2023.)

#### 2.6 Deck machinery & Motion control division

Kongsberg Maritime provides a wide range of products and systems within safety critical deck machinery from mooring and anchoring winches to anchor handling, specialized winches, and handling systems for offshore, merchant,

tugs, fisheries, naval vessels and other types of ships and offshore installations. The steering gears available from Deck Machinery & Motion Control (DMMC) are suited for ships of all shapes and sizes. Kongsberg Maritime fin stabilizers help ensure safe and enjoyable cruise excursions, steady naval warships, and secure cargo (Kongsberg Maritime website, 2023.)

Figure 2 presents Four main business areas of Kongsberg as well as four sub divisions within Kongsberg Maritime that are were previously discussed. The area of interest in this study is deck machinery.

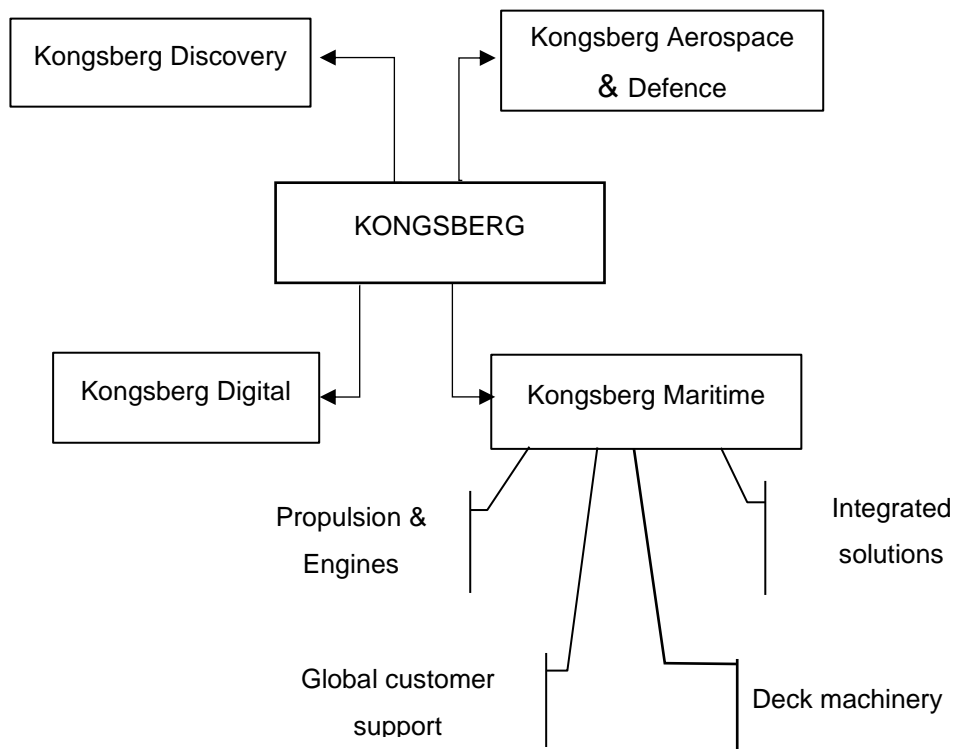


Figure 2. Kongsberg four main business areas and sub-divisions

Anchoring, mooring, and towing winches are part of Kongsberg deck machinery products designed in Rauma product centre, and manufactured in Busan, Korea. The warehouses for spare parts are in Rauma and Helmond, in the Netherlands. There are three different primary drive types for the winches: 1) hydraulics, low or high pressure 2) Three-speed pole-change electric drive 3) Electric frequency converter with stepless speed control.

Due to this versatility, clients can select the drive that best meets their requirements and the winch that is the most efficient among all available options. It is estimated that the product will last for at least 25 years once it is in use. There will be significant changes in the available and developing technology during that time. The company's objective is to help its customers throughout the expected life of the equipment; thus, it offers a range of aftermarket services to enable customers to continuously enhance the performance of their vessels (Reunamäki, 2017, p. 7-8.)

Windlass and high-pressure hydraulic mooring winch shown in figure 3 are one of deck machinery products in Rauma. These products are available for tugs, tankers, container vessels and cruise ships. All designs are done in Rauma and assembling is Busan, Korea.

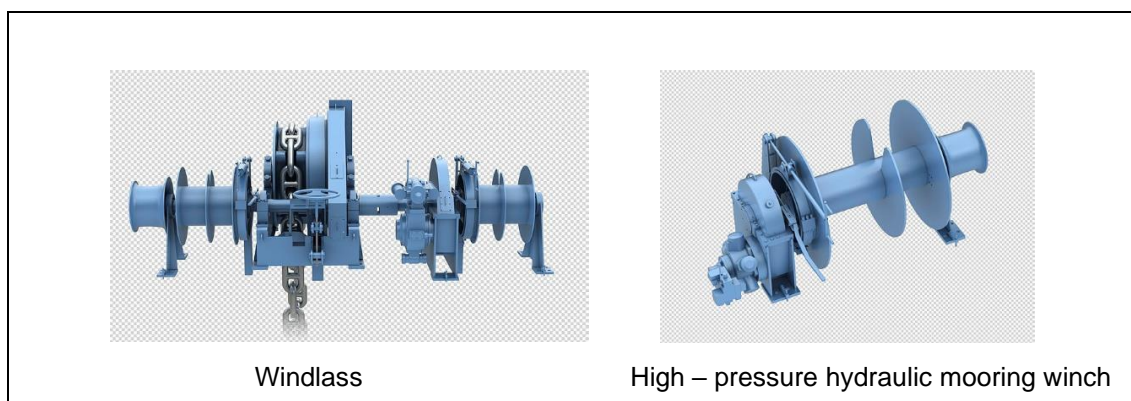


Figure 3. Rauma AMT products (Kongsberg Maritime website, 2023.)

### 3. SHIPPING INDUSTRY AND MARITIME SECTOR IN NAMIBIA

#### 3.1 Namibia

Since gaining its independence in 1990, Namibia an Upper Middle-Income Country has made notable advancements in both the economy and society. Namibia is strategically located on Africa's south-western coast as a crucial



trading route with the rest of the landlocked world like Botswana, Zambia, Zimbabwe, and the Democratic Republic of the Congo through the port of Walvis Bay. The poverty rate in Namibia drastically decreased from 69% in 1993 to 17.4% in 2018, while the nation's economy up until recently saw robust and consistent growth. Continual political stability, strong macroeconomic management, and good governance have served as the foundation for this outstanding accomplishment (African Development bank, 2020, p. 15.)

Namibia is still one of the least corrupt nations in Africa, but more needs to be done to improve institutional accountability. The 2019 World Press Freedom Index placed Namibia in the 23rd spot overall and first in Africa. The main obstacles and difficulties to sustainable and inclusive growth are insufficient economic diversification into higher value economic industries, a shortage of qualified labour, outdated infrastructure, a declining business-enabling environment, and competitiveness (African Development bank, 2020, p. 34.)

According to FDI Greenfield index - The index that show information on which countries and regions were successful in attracting new investments and fostering favourable business conditions for foreign companies. It shows Namibia as the top African country in attracting foreign direct investment (FDI). This indicates that there is a rising trend in investors' confidence and this acknowledgment strengthens Namibia's reputation as a premier investment destination playground in Africa (The Brief Live Nam Website, 2023.)

Namibian sectors with an abundance of untapped development potential are waiting for investments. The fields of green hydrogen, renewable energy, oil and gas, chemical manufacturing, sustainable tourism, transportation and logistics, and value addition opportunities in the mining sector (NIPDB website, 2023.)

### 3.2 Fishing Industry

Over 15% of export revenues come from the fishing industry, which is the third-largest source of income after mining and tourism. Namibia is among the nations with the highest fisheries capture in Africa according to the sector's yearly marine landings of 550,000 MT. Over 6,800 people are employed directly and over a half million people indirectly by the fishing industry. Most Namibia's fisheries are industrial and export-focused, going to Europe and Southern African Development Community (SADC) member states (African Development bank, 2020, p. 44.)

The fishing industry's economic cycle is reaching a stage of maturity, indicating a limit to the extent to which it can grow. Most Namibia's fish exports are sent to SADC and European countries through Spain, and the export bill of fish has climbed for nine months running, reaching a 60.2% year-over-year gain in May 2023. The export bill increased from N\$697 million in May 2022 to N\$1.1 billion in May 2023 (Business Express website, 2023.)

### 3.3 Fishing Companies in Namibia

Every company involved in shipping in Namibia has three to five or more vessels with an engine capacity from 1500Kw. Fishing sector is business driven, majority of the companies will ensure that there is operation going on 24/7 to secure as much fish as possible and to sail back and forth for fish delivery to the factory. That will lead to high demand for service, repair maintenance ship deck machineries such as fish trawling net winch. Many fishing vessels need more upgrades and require substantial maintenance on their machineries to ensure they perform their daily commercial tasks (Haimbala, 2021, p. 7-11.)

There are a number of fishing companies in Namibia both locally and internationally registered, shown in table 1. The Namibian government awards fishing quotas to all companies that meet certain requirements to fish one kind of fish species.

Table 2. Fishing companies in Namibia (Haimbala, 2021, p. 7-11.)

<b>Name of Company</b>	<b>Town</b>
<b>Hangana Seafood</b>	<b>Walvis bay</b>
<b>Turnacor Fisheries</b>	<b>Walvis bay</b>
<b>Merlus Fishing</b>	<b>Walvis bay</b>
<b>Etosha Fisheries Holding</b>	<b>Walvis bay</b>
<b>Embwinda Fishing</b>	<b>Walvis bay</b>
<b>Pereira Seafood Company</b>	<b>Walvis bay</b>
<b>Seawork Fish Processors</b>	<b>Walvis bay</b>
<b>Benguela Fishing Company</b>	<b>Walvis bay</b>
<b>Gendev Fishing Company</b>	<b>Walvis bay</b>
<b>Namsov Fishing Enterprises</b>	<b>Walvis bay</b>
<b>Omuala Fish Processors</b>	<b>Walvis bay</b>
<b>Pescanova Limited</b>	<b>Walvis bay</b>
<b>Novanam Limited</b>	<b>Lüderitz</b>

### 3.4 Oil and Gas Industry

Namibia has discovered two large light crude oil wells and associated gas in the last 18 months located Orange Basin, namely, Venus-1X and Graff-1X deep-water exploration wells. Since 2015, the Venus-1X well was drilled by Maersk Voyager drillship to a total of 6296 meters, the well discovery ranks as the second-largest deep-water oil discovery in the world. In March 2023, the third well of light oil was discovered, the Jonker-1X, drilled by Odfjell Deepsea bollsta, a semi-submersible rig which drilled the well to a total of 6168 meters in water depth of 2210 meters in the Orange Basin, offshore southern Namibia (NAMCOR website, 2023.)

It is expected that Namibia's oil and gas industry will achieve its production by 2026. The oil discoveries have a potential reserve of 11 billion barrels, and this have the potential to propel the country among the top 15 oil-producing countries by 2035 (The Brief Live Nam website, 2023.)

Figure 4, French Energy company oil rig, Total Energies. It's one of the oil rigs that are set to drill offshore Namibia.



Figure 4. Oil rig (The Brief Live Nam website, 2023.)

### 3.5 Offshore Diamond Mining Industry

Offshore mining has started in the late 1950s, the offshore industry has now matured. Production is accomplished in a number of ways over an 800 km stretch of coastline at nearly 200 m of water. North of the Orange River, which forms the border, Namibia makes up half of the entire coastline; the other half is in South Africa. Eventually, Namibia's offshore diamond mining sectors emerged as significant contributors to the global supply of gem-quality stones (Garnett, 2018, P. 2.)

#### 3.5.1 Debmarine Namibia

Debmarine Namibia is a 50/50 joint venture between De Beers Group and the Government of Republic of Namibia. Started operating since January 2002, Debmarine Namibia mines off Namibia's southern coast in the Atlantic 1

license area. Debmarmine Namibia is a global leader in terms of technology for maritime diamond mining and exploration, (De Beers Group website, 2023.)

The company operates a fleet of six diamond mining vessels and one exploration and sampling vessel, the mv SS Nujoma. The vessels are, mv Debmarm Atlantic, mv Debmarm Pacific, mv !Gariiep, mv. Peace in Africa, mv Grand banks and the Benguela Gem. Mining takes place on the ocean floor at water depths ranging from 70 to 140 meters, diamonds are recovered in a totally enclosed space with no human interaction (Debmarmine website, 2023.)

In figure 5, Namibia's new diamond recovery vessel, Benguela gem regarded as world most advanced diamond recovery vessel. The vessel was built by Damen shipyards in Romania and it was delivered to Namibia in 2021 after her sea trials. It's among Debmarmine's five diamond recovery vessel.

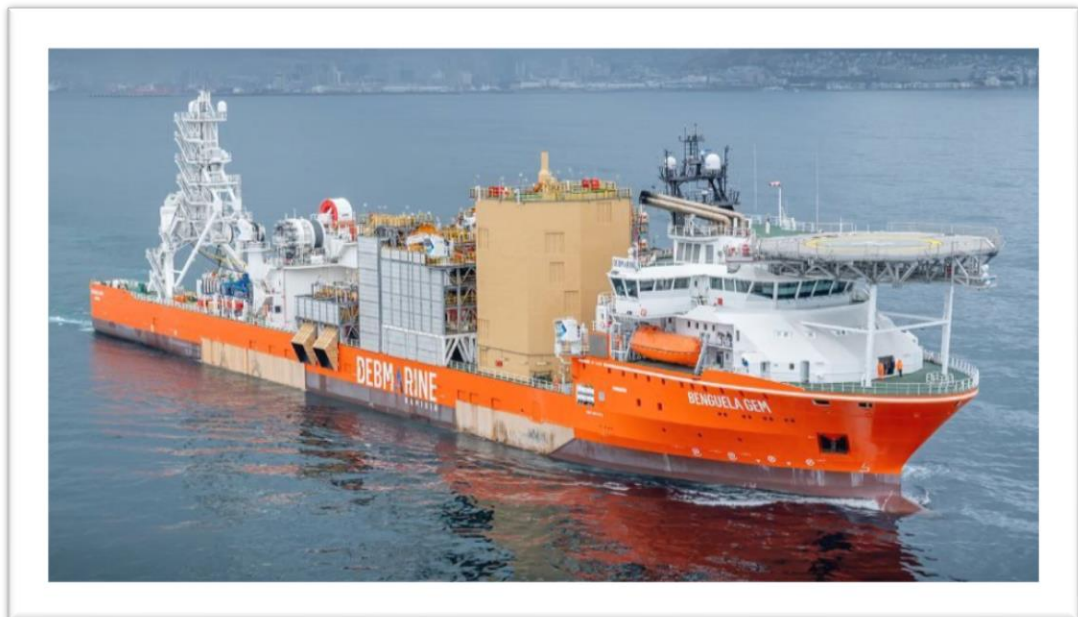


Figure 5. Debmarmine diamond recovery vessel (Debmarmine website, 2023.)

## 4. NAMIBIA'S MARITIME PORTS AND DOCKING FACILITIES

### 4.1 Namibian Ports Authority, NAMPORT

Namibian Ports Authority, is strategically situated halfway along Namibia's coast and has easy access to the main shipping lanes. The port of Walvis Bay is the Namibia's main commercial port, acting as natural point of entry and exit for international trade, it receives over 3000 vessel calls annually and handles more than 5 million tons of cargo. The port's world-class infrastructure and equipment's enable dependable and secure cargo handling, and it is secure and effective. All year round, there are mild weather conditions, and there are no weather-related delays. The port has six tug boats (Namport website, 2023.)

The port of Walvis Bay handles container imports, exports, and transshipments, as well as bulk and break-bulk of various commodities. Namport serves a wide range of industries such as petroleum, salt, mining, and fishing industries. Both bulk and bagged are exported from the port of Walvis Bay.

The port receives a wide range of different types of vessels such as Container ships, RORO ships and cruise liner ships. It is noted that world-wide cruise liner ships visiting the port are growing 5 to 6 percent per annum, with 22 million people taking cruise holidays during 2015-2021 (Namport website, 2023.)

There is different type of vessels that visit the port Walvis Bay shown in figure 6. These vessels do not only deliver goods and products for Namibia, but also for landlocked countries.

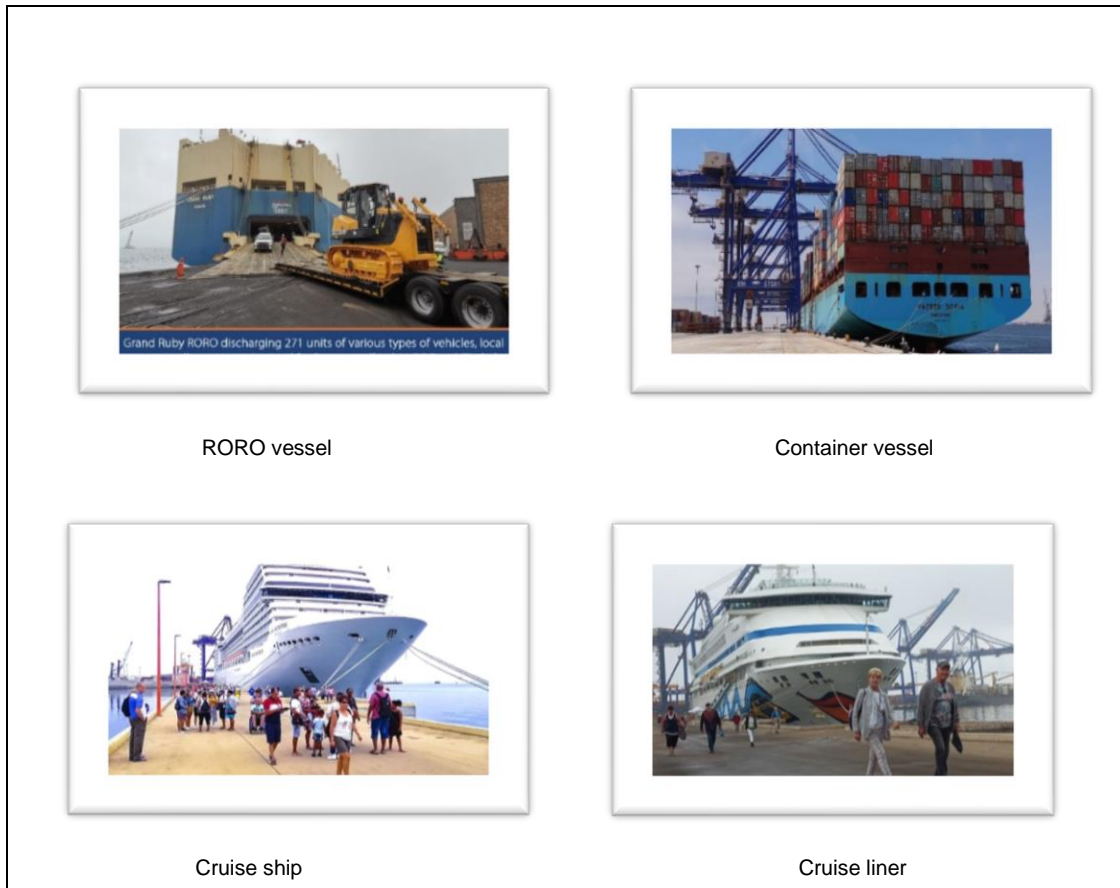


Figure 6. Different type of vessels that visit the port of Walvis Bay (Namport website, 2023.)

#### 4.2 Syncrolift Ship Repair Facility

Namport operates syncrolift for ship repairs which has a lifting capacity of 2000 tons, a maximum overall length of 70 meters, and a maximum width of 12 meters. Many local ship repairs are done here, and it is used as a crucial facility to dry dock, repair, and repaint vessels in the adjoining bays. Additionally, it offers a wide range of engineering services in its own workshops, which are located around the town of Walvis Bay (Namport website, 2023.)

In Figure 7, Namport Syncrolift ship repair facility where most of the local vessels are repaired in the adjoining bays. Vessels that mostly repaired are fishing vessels that have a maximum required weight or else the vessel will be send to floating docks.

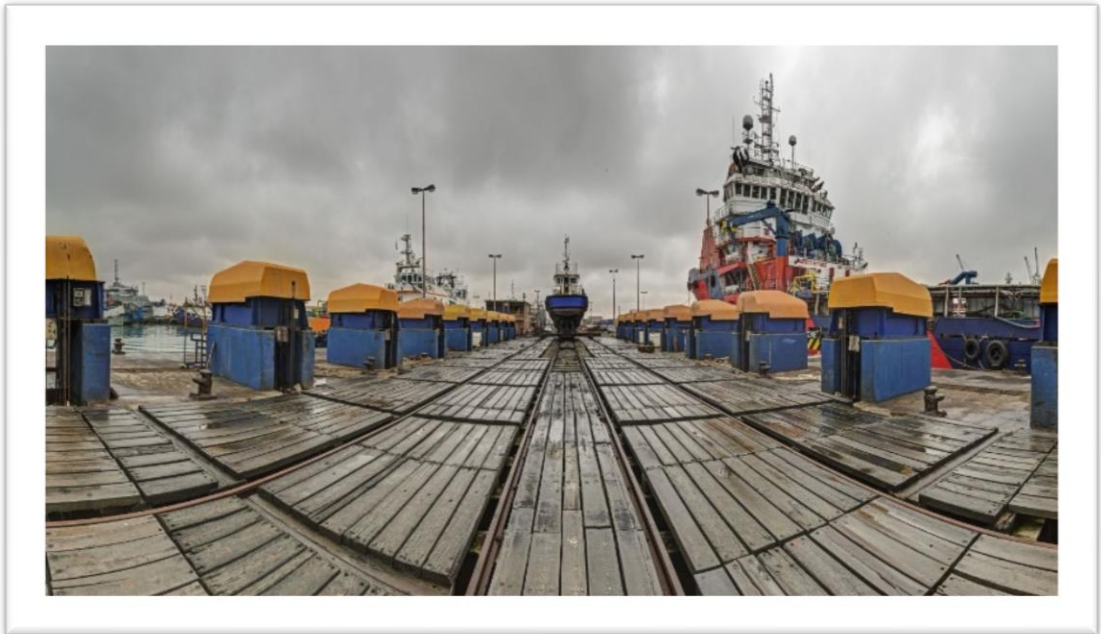


Figure 7. Syncrolift ship repair (Namport website, 2023.)

#### 4.3 Namdock

Namibia Drydock and Ship Repair (NAMDOCK), is a leader in the south-west African ship repair market, with a focus on marine and industrial engineering. With a broad clientele that is continuously supplied daily, it has attained international renown as a ship repair facility. There are three floating docks, seven cranes, one 60-ton floating crane, and fully stocked on-site workshops.

The majority of the vessels serviced on Namibia Drydock and Ship Repair's floating docks are platform support and anchor handler tug that operate in West Africa's oil and gas industry. Seismic vessels, subsea construction vessels, dredgers, tankers, and container ships are also repaired there (Namdock website, 2023.)



In figure 8, three floating docks for Namdock. The floating docks have different sizes and different tensile strengths on their cranes. Floating docks floor is either made of concrete or steel.



Figure 8. Namdock floating docks (Namdock website, 2023.)

Walvis Bay port, the gateway to the world of maritime transportation industry. Several different types of vessels visit the port of Walvis Bay time to time every year. Walvis Bay is where Namibia's major seaport is located. Figure 9 shows different maritime transport routes that are linked to Walvis Bay port.

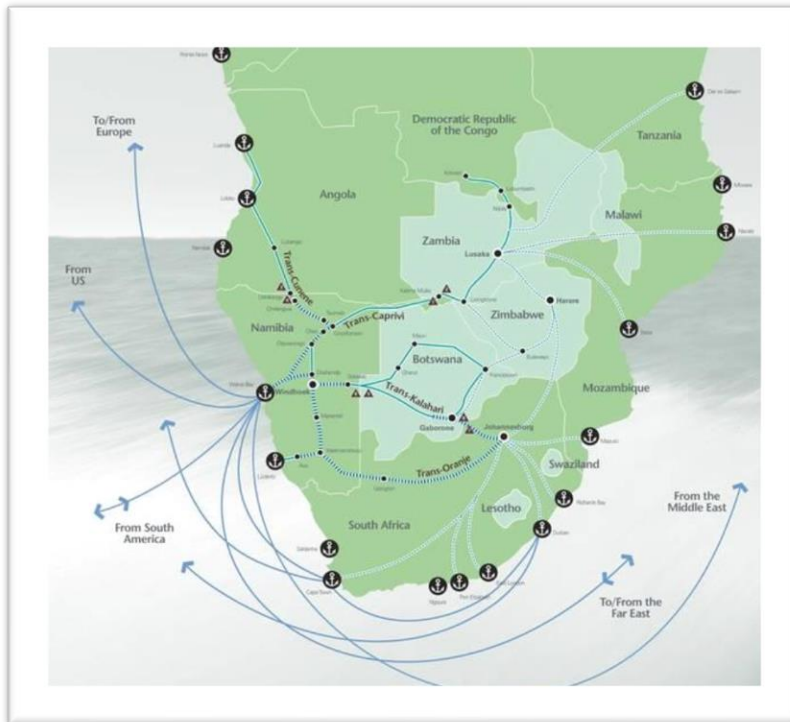


Figure 9. Walvis Bay, the gateway to the world (Walvis Bay corridor group, 2013).

## 5. NAMIBIA AND ITS EDUCATION SYSTEM

Education was able to be incorporated into the country's revised constitution when it gained independence in 1990 because of the "Education for All" (EFA) initiative, which was launched at that time. Since then, the government has included access, equity, better education, and democracy as part of its Vision 2030 plan. According to Namibia's constitution, every citizen should have access to and the right to basic education. Education system consist of seven

years for primary school, three years for junior secondary education, and two years for senior secondary education as well as 4 to 6 years for tertiary education depending on the course of study (Moritz et al. 2020, p. 5.)

Within the Republic of Namibia, education has become an essential aspect. It is a crucial component of the country's shift to knowledge-based economy and expected to help in the achievement of sustainable economic growth. Governmental spending on education, student enrolment, and educational institutions are all rising steadily. Namibia's Universities are, University of Namibia (UNAM), International University of Management (IUM) and Namibia University of science and technology NUST, (Moritz et al. 2020, p. 6.)

Figure 10 describes the structure of Namibian education system. Primary, secondary and tertiary are Namibia's junior childhood education. Maritime studies are pursued through tertiary or educational maritime institutions.

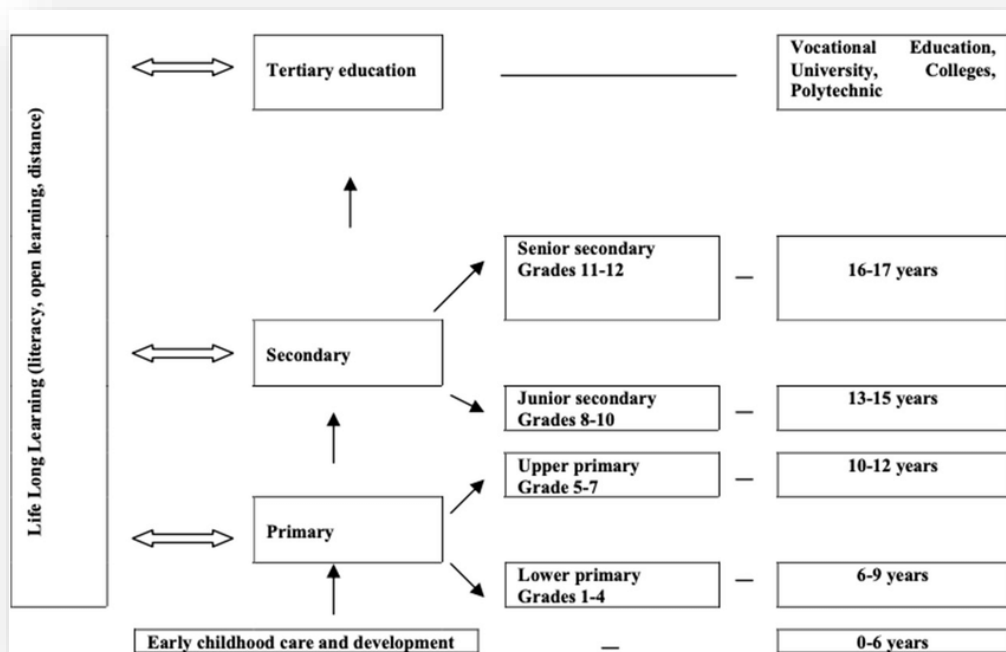


Figure 10. Namibia's education system (Moritz et al. 2020, p. 6.)

## 5.1 Maritime Studies in Namibia

The Maritime education in Namibia hasn't been up to standard as required. This was one of the reasons why the Maribilis project was introduced. The maribilis project aims to enhance higher education competencies in Namibia in the fields of maritime, fisheries, and logistics. This supplemental project will strengthen Namibia's economy by lowering youth unemployment and expanding employment opportunities in the maritime and fishing industries both locally as well as globally. The research vessel R/V MIRABILIS, sold to Namibia Republic in 2011 from STX Rauma Finland shipyard was fully integrated into the project as a living lab environment for the NUST double degree programme in electricity and maritime engineering (HEI ICI programme, 2018, p. 1.)

### 5.1.1 Namibia University of science and technology, NUST

Namibia University of science technology began its operations in 1991. There are currently over 15000 students enrolled studying on full-time, part-time, and distance education basis. The University currently consist of six faculties, namely, computing and informatics, commerce, Human sciences and education, Engineering and build environment, health, natural resources and applied sciences. Out of 12,000 students enrolled at NUST (as of 2020), more than 700 are foreign students from all around the world. International students fall into one of the four categories for international students, namely, exchange, study abroad, interns or full degree. Students come from countries like, south Africa, Angola, Zambia, Zimbabwe, Cameroon, Nigeria, Kenya, Ghana, China, India, Indonesia, Malaysia, Finland, Germany, Italy, Spain, UK and the US (NUST website, 2023.)

NUST has not been offering maritime engineering studies, but this came as partnership between NUST and Satakunta university of Applied sciences (SAMK) along with Maribilis project. The objective of this project was to ensure better access to information for maritime education and research and to improved standards for higher education and the environment for maritime research in the maritime industry for Namibia. In addition, also to improved

institutional capability in supporting high standards of maritime teaching, research and increased importance and significance of higher education in the growth of society development. The project's goal is to improve Namibia's higher education capabilities in the maritime sector (HEI ICI programme, 2018, p. 5.)

SAMK was in charge of Improving access to educational and research information, and improving institutional capability supporting quality teaching and research in the marine field (HEI ICI programme, 2018, p. 1.)

#### 5.1.2 Namibian Maritime and Fisheries institute, NAMFI

NAMFI, located in Walvis Bay is a maritime educational college that was established in 1996 with the goal of training fishermen and seafarers for Namibia's local and international requirements. There are three different training departments, namely, navigation, ship engines, and safety. The Directorate of Maritime Affairs (DMA) oversees the funding and management of NAMFI. Directorate of Maritime Affairs and the Ministry of Works and Transport are the IMO compliant supervising authorities in Namibia (NAMFI website, 2023.)

#### 5.2 Challenges faced by Maritime Education and Training in Africa

Trainings for graduate engineers in Africa's maritime industry is not sufficient to enable them to compete in global labour market as they still need a better level of competence. In contrast to other countries in Africa, the maritime industry has only recently been placed on the national agenda, and often, it was not seen as a long-term beneficial system, but as a quick way to improve economic fortunes. Consequently, the culture of using labour in the maritime industry is relatively new and has not become part of all countries in Africa. The consequence is that there is a broad lack of understanding about the potential

that the maritime industry can have, and considerable efforts are needed for education in this regard at all levels of society (AFRIMET, 2020, p. 83.)

It is noted that in some African countries there are no vessels intended for cadet training. Consequently, this turns out to be a global challenge as there are not enough training spaces for cadets to move on to obtain their first Certificate of Competence (CoC). If an institution produced a substantial number of maritime students to be trained, it is highly possible for their berths not to be located, and this will cause an increase in unemployment rate (AFRIMET, 2020, P. 83.)

This kind of situation pushes cadets to try and find berths on international trading vessels to complete their sea time. The ability to create training opportunities onboard vessels, particularly for first certificates of competence, is a persistent challenge. The ongoing cadet berths shortage was made worse in 2019 when Maersk Line (ML) reduced the number of South African cadets it accepted, eliminating about 250 cadet places in total. The funding organizations then question why they should support cadets when there is no placement for them (AFRIMET, 2020, p. 79, 83.)

Another challenge is an extensive shortage of infrastructure and technical instruments for training maritime labour, including training tools such as simulators. Despite this, there is also a perceived lack of funding for crucial learning resources and facilities, and there is a long wait (up to 2 years) of waiting when applying for funding from the government. As a result, candidates who have received job offers but are unable to meet the requirements lose out on the opportunity. A further difficulty is finding and keeping qualified instructors and assessors (those with necessary levels of qualifications and industrial experience). Sometimes it might be difficult to teach and evaluate mariners. This is being made worse by rapidly advancing technologies (AFRIMET, 2020, p. 79, 82.)

Simulators are one of the crucial tools used for trainings in maritime studies. It is recommended that students need to do some practices on simulators before

onboard training. Figure 11 illustrates Namibian delegates given an overview on simulators at Satakunta University of Applied science, SAMK.

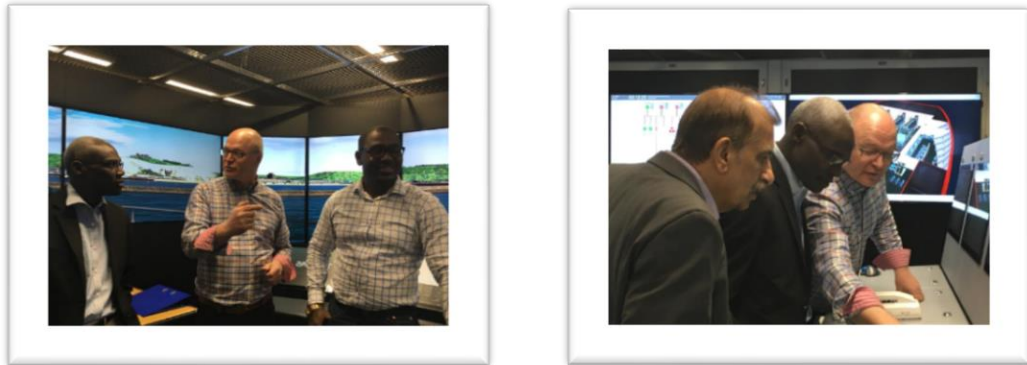


Figure 11. Deck and Engine simulators (NUST website, 2023.)

Figures 12 and 13, the researcher's supervisor giving training to the stakeholder companies' trainers on ship electrical control systems on RV Maribilis research vessel.

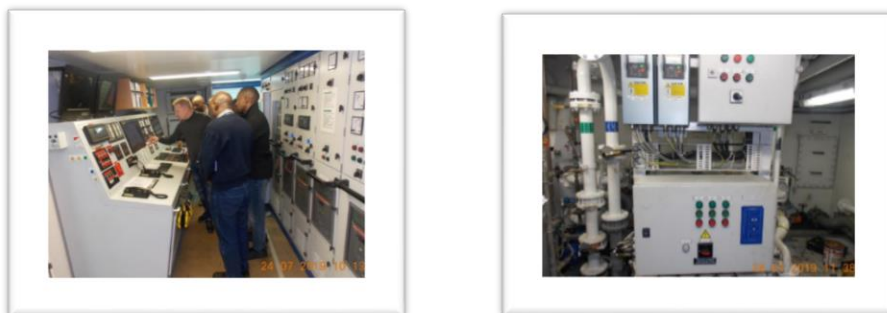


Figure 12. Training of trainers (NUST website, 2023.)



Figure 13. Namibia University of Science and Technology, (NUST) faculty of Engineering embraces maintenance software training (NUST website, 2023.)

Figure 14 illustrates scheduled training ideally for electro-technical officers who would like to boost their skills in the marine field. The researcher's supervisor was the one training the stakeholder companies' persons through the facilitator Namibia University of Science and Technology (NUST) in 2019.



**TIME TO BOOST YOUR SKILLS?  
REGISTER NOW!**

**Service and Maintenance of Ship Electrical and Automation Systems**

**Stakeholder Training Short Course**  
**31 July - 02 August 2019**  
**Cost: N\$ 7 500.00**  
**Venue: Walvis Bay**

**Training**  
 The Namibia University of Science and Technology (NUST) is offering a short course in Marine Engineering in partnership with the Satakunta University of Applied Sciences (SAMK), Finland, and the Namibian Maritime and Fisheries Institute, (NAMFI). This course aims at improving participants technical knowledge in service and maintenance of ship electrical installations and automation systems.

**About the Facilitator: Mr Jarno Laine**



Mr Laine, a Senior Instructor/Lecturer from SAMK/Winnova in Finland, is highly experienced in the ship electrical systems and automation in general and also with the R/V Mirabilis systems in particular.

He has qualifications from various reputable institutions such as Tampere University of Applied Sciences. Mr Laine has over 20 years experience and he has served on several boards. Currently, he is the chairperson of the Electricity and Automation committee of the Finnish Maintenance Society.

**Target Group**  
 The training is ideal for electro-technical officers in the Marine Engineering field.

**Learning outcomes:**

- Explain the regulations related to ship electrical installations
- Identify the main ship electrical and automation systems
- Describe the working principles of the main ship electrical and automation systems
- Trouble-shoot and rectify faults in ship electrical and automation systems
- Explain the planned and periodic maintenance required for ship electrical and automation systems
- Carry out basic service, planned and periodic maintenance on ship electrical and automation systems etc.

**Enquiries:**  
 Sisi Kaapehi  
 Secretary  
 T: +264 61 207 2694  
 E: [skaapehi@nust.na](mailto:skaapehi@nust.na)



**NAMIBIA UNIVERSITY OF SCIENCE AND TECHNOLOGY**



**samk**  
 Satakunta University of Applied Sciences



**NAMFI**  
 NAMIBIAN MARITIME AND FISHERIES INSTITUTE

Figure 14. Stakeholder training advertisement (NUST website, 2023.)



## 6. CASE COMPANY AFTERMARET SERVICES

### 6.1 Spare parts

It is crucial for every vessel involved into sea going to have onboard spare parts readily available onboard a vessel. Anchoring mooring and towing winches are one of the main deck machineries on board a vessel with critical parts that will need to be considered immediately once one of the components is worn out. Spare parts are kept on board to minimize the effects of equipment downtime, playing a critical role in maintaining the necessary equipment availability at the lowest possible cost. There might be significant financial loss if spare parts are not available when they are needed for repairs (Ozturk., 2007, p. 39-47.)

Equipment maintenance requires the use of spare parts, which are sometimes frequent inventory stock items. It has been noted that a significant portion of the cost of a product's lifecycle goes toward spare components. The annual consumption of spare parts for machinery, which may have a useful life of up to 30 years, can reach up to 2.5 percent or more of the purchase price (Gallagher et al., 2005, p. 56).

### 6.2 Service and maintenance

Deck machinery equipment's such as anchor handling chains and winches need to be serviced and maintained for longer life spanner. Marine deck machineries are critically dependent on service and maintenance. Each year, successful companies allocate substantial sums of money for upkeep (Guignieret al., 1999, p. 12.)

Failure to manage maintenance might result in expensive penalty costs brought on by business downtime (Dekker, 1996, p. 54).

Modern technology necessitates continuous service maintenance, which has elevated it to an essential position. Service and Maintenance is necessary to ensure the functionality of machines onboard a vessel. Because well-

maintained equipment is more likely to function to meet requirements, preventing quality issues, it is possible to prevent quality faults. If maintenance is carried out on a regular basis, operating costs can be reduced. Longer life cycles for the machinery; good maintenance can extend the useful life of an equipment by reducing the minor issues that arise during use and add up to wear or deterioration (Guignier et al., 1999, p. 17.)

### 6.3 Upgrades services

Upgrading is an adjustment to the equipment's, whether it be adding a change, modification, or improve, that enhances the equipment's functionality, capacity, or performance and a prolonged life cycle of the machine or an equipment. Equipment updates and calibrations can be a part of equipment upgrades. Every piece of equipment currently on the market will deteriorate with time, whether it's because of prolonged usage, indications of faulty parts, or poor use of the equipment. To fix the problem after that, it is either necessary to repair, replace, or upgrade. Anchoring mooring and towing winches are among of deck machineries that need technical upgrades, system upgrades as well as new programs with latest technology (Lauder., 2020, p. 46).

## 7. CASE COMPANY LOCATIONS ACROSS AFRICA

Kongsberg Maritime has two service facilities in the southern area of Africa. It is crucial that there is a continual support to assist Kongsberg Maritime worldwide customer base by making sure that there are local service facilities ready to help wherever the vessel may be in this region. Furthermore, this puts a team of professionals in a more convenient location for Kongsberg Maritime customers in the area, allowing for a quicker and more affordable response if there is a need to visit a vessel. This will promote a long-term perspective and

anticipate that African continent will become even more attractive in the future (Kongsberg Maritime website, South Africa.)

There are two countries in Africa shown in figure 15 where Kongsberg Maritime service centres are located i.e. Namibia and South Africa. Each offers different Kongsberg Maritime support services to customers across Africa.

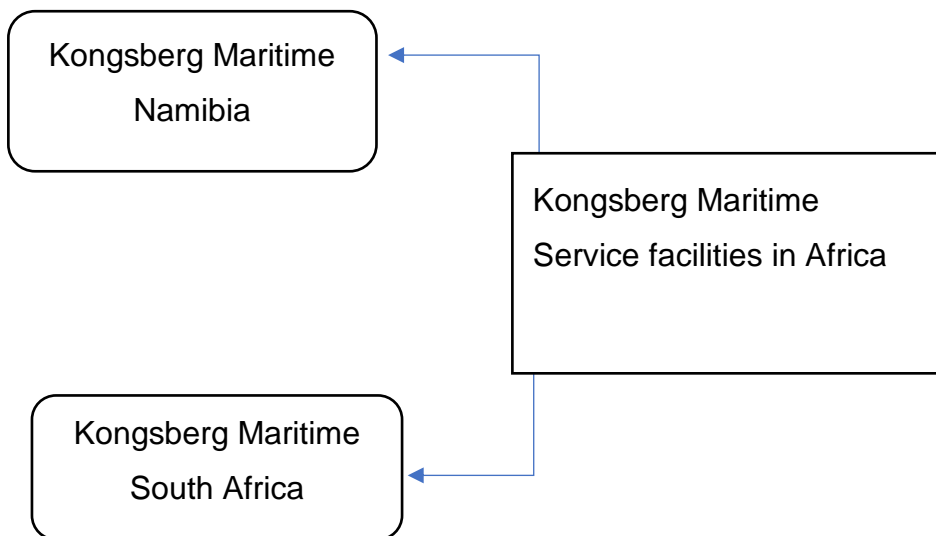


Figure 15. Kongsberg Maritime locations in Africa

Kongsberg Maritime offers several maritime services through its respective centres in Africa. The support services include other services and not only for deck machinery. Table 3 illustrates an overview of support services offered at respective Kongsberg Maritime centres in Africa.

Table 3. Support services offered in Africa (Kongsberg Maritime website, 2023.)

Kongsberg Maritime support services offered in <b>South Africa</b>	Kongsberg Maritime support services offered in <b>Namibia</b>
Dynamic positioning systems	Deck Machinery
HiPAP – Acoustics underwater	Fin Stabilizers
Positioning and Navigation system	Cranes

Stand – alone voyage data recorder	Propellers
Marine automation system, K- chief position, motion & heading thrusters systems ocean science & mapping information management systems.	Steering gear

### 7.1 Kongsberg Maritime South Africa

Kongsberg Maritime South Africa was officially opened on the 4<sup>th</sup> November 2016, it is located near the airport area of Cape Town, it's in the suitable place for serving better customers who are based in or traveling to other ports across the country and in the Sub-Saharan region. The building includes office, warehouse, testing lab space, in addition to that is the training facility to assist local offshore operators in satisfying local content standards. Currently, Kongsberg Maritime South Africa serves all customer demands in the merchant automation and dynamic positioning divisions, service and maintenance, and after-market support. The facility is serving as a local point of contact for all clients in Africa (Kongsberg Maritime website, 2023.)

### 7.2 Kongsberg Maritime Namibia

The service facility have been operating for about 11 years ago under the name Rolls Royce. It was officially branded to Kongsberg Maritime Namibia in 2019. The service facility have been responsible for giving assistance to all clients throughout Africa since then. The service facility works closely with South African service facility. It also works closely with product centres, Rauma and Brattvag (Kongsberg Maritime website, 2023.)

### 7.3 Kongsberg Maritime Training Centres

Training is the best tactic Kongsberg Maritime uses to give in-depth knowledge of their products and practical training needed to apply during product operations. Deck machinery training centres are located in three countries so far, i.e., Korea Republic, Brazil, and Norway. The only training facility in Africa is located in South Africa and was developed to give high-quality personal training and safer maritime operations in dynamic position, navigation, and marine automation (Kongsberg Maritime website, 2023.)

## 8. CASE COMPANY COMPETITORS IN AFRICA

Maritime industry is one of the broadest market environments. As the African maritime sector expands, more shipments to and from the continent will be attracted, strengthening the aftermarket industry. As a result, the market can have as many competitors as feasible for a particular aftermarket service. According to the marketing philosophy, a company must exceed its rivals in terms of customer happiness and value to succeed. Marketing professionals must position their products strongly in comparison to those of competitors to acquire a strategic edge (Bobek, 2020. P.41.)

### 8.1 Stone Marine Services

This is among the prominent competitors in southern Africa. Its range of maritime services are diverse and includes important areas such propulsion, Marine controls, deck machinery, dynamic positioning, stern seal service, spare parts, propeller repair and steering gear. Their offices are located in Namibia, south Africa, and United Kingdom (Stone Marine Services Website, 2023.)

## 8.2 Dynamic Marine Survey and Solutions

From the corporate office located in Walvis Bay, Namibia, they provide marine surveying, upgrades, repairs, navigation, automation, propulsion controls, and mechanical markets, project management, and technical advice for Dynamic Positioning systems, sensors, control units, and any other capital mechanical equipment to clients throughout Africa and the Middle East. They have in-house surveyors, mechanical engineers, and electrical engineers, the company specialises more in marine electronics and mechanics sales and service that supports the critical maritime, oil, and gas market 24 hours a day. The company is located in Namibia, South Africa and in the Netherlands (Dynamic Marine Survey & Solutions website, 2023.)

## 8.3 AEGIR Marine

AEGIR Marine company have over 20 years of experience working with the maritime sector. The company have several locations around the world like in Namibia, Australia, Singapore, China, UAE Dubai, Greece, Turkey, Panama, USA and in the Netherlands (AEGIR Marine website, 2023.)

# 9. SECURITY RISKS FACED BY MOBILE WORKERS TO AFRICA

## 9.1 High Risk Areas

In every aspect safety of persons must always be put into consideration. In Sub – Saharan Africa region lies some countries unsafe to travel and might be dangerous and life-threatening to mobile workers. Therefore, there is a need for better understanding of the general security situation for countries that mobile workers may visit or work in. In turn, it is paramount for organizations to be aware of danger-zones in Africa as it will assist them in making proper

decisions so they may develop solutions that are specifically designed to reduce any dangers that their workforces may face. This could be because of unstable governments, political conflict (includes terrorism, insurrection, unrest driven by politics, and war), severe natural disasters or economic conditions, all these can pose a hazard to the health and safety of mobile workers (international SOS, 2013, p. 1.)

Even basic emergency services might not be available in certain countries. It could be difficult to get good prescription medications. The training level of doctors in some of these countries is typically insufficient. Threats from severe infectious diseases like typhoid, cholera, dengue fever, and malaria may be significant. It is possible that travellers with moderate to severe illnesses or injuries will need to be evacuated internationally (international SOS, 2013, p. 1.)

International SOS rates the quality of local medical and dental care, access to prescription pharmaceuticals, the risk of serious infectious diseases, and administrative, language barriers, and cultural challenges when determining the medical quality of a country. The medical risk within a country can vary widely. For example, major cities may have lower risk whereas remote or rural communities may have higher risk (international SOS, 2013, p. 1.)

Figure 16 presents the security risk map for Africa for the year 2022. These data are updated each and every year by international SOS company. The risk per country is either extreme, high, medium and low.

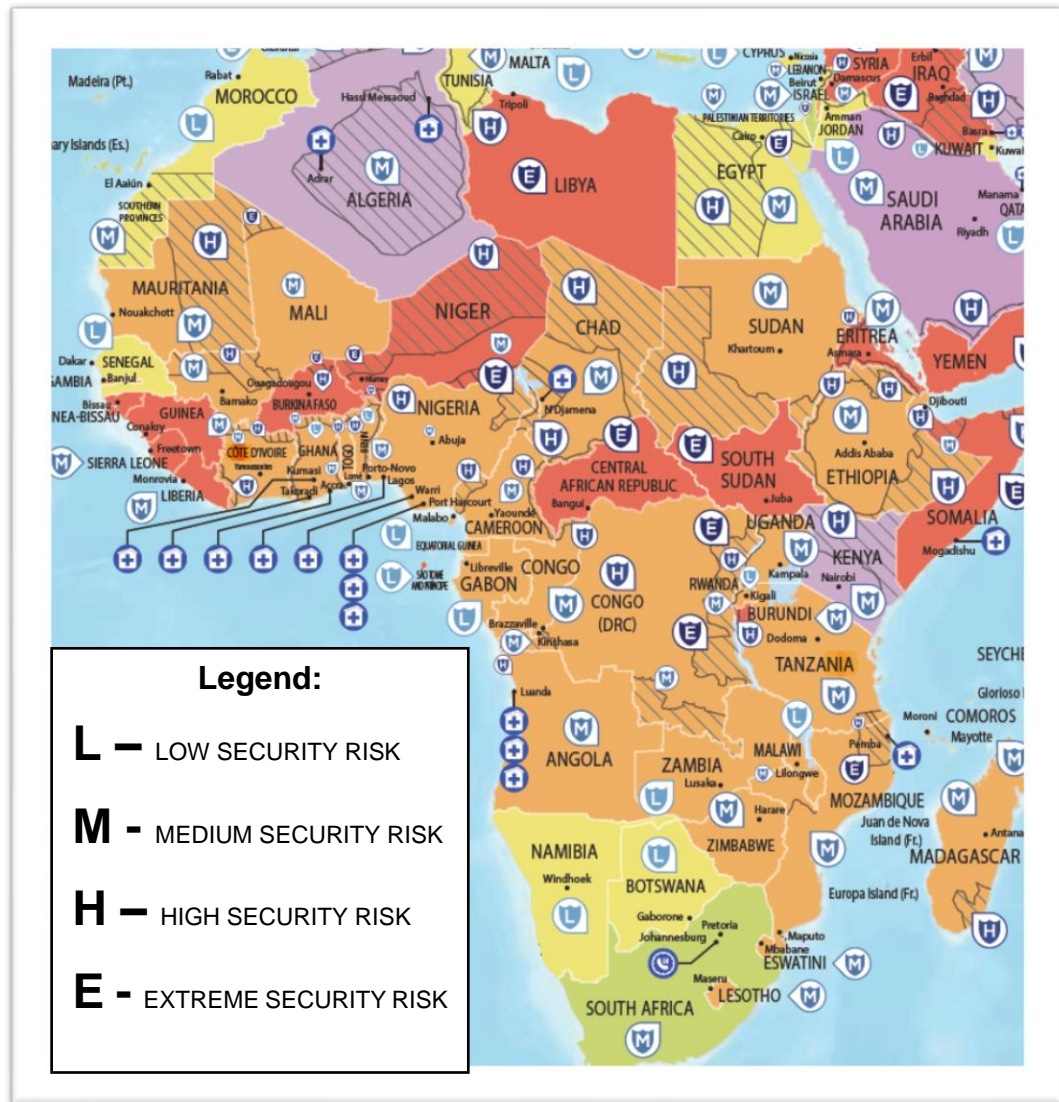


Figure 16. International SOS Security risk levels in the Sub-Sahara Africa continent (international SOS, 2022.)

According to International SOS data for 2022, many countries in Africa have



medium security risk level and least with extreme security risk level. In figure 17, the level of security risks in percentage across all countries of Africa.

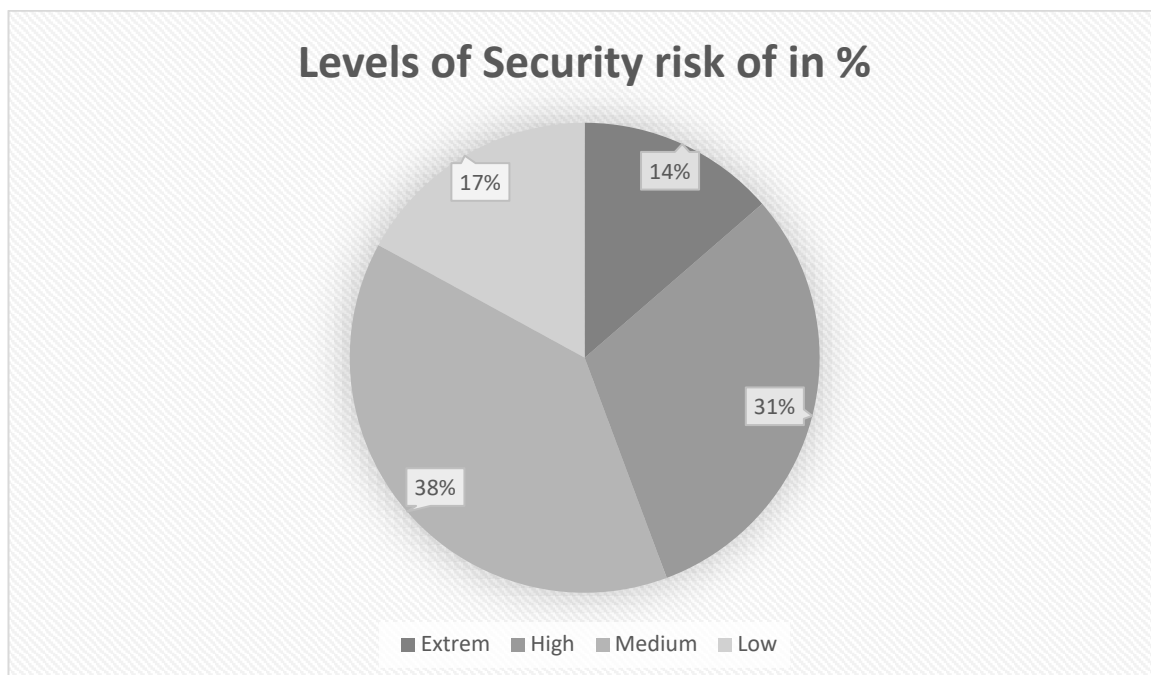


Figure 17. Overall security risk in Africa (International SOS security risk data, 2022)

## 10. TRADE AND MARITIME TRANSPORT IN AFRICA

Sea transportation contributes about 75% to the world economies. Seaports and canals including the Suez Canal in Egypt there is always traffic that sometimes leads to a heavy traffic congestion. This simplifies that a vessel can experience any kind of breakdown anywhere around the world. A well-functioning maritime transport sector in Africa is a key to unlocking new and boosting existing potential business opportunities especially for aftermarket type as there is a good number of vessels circulating within the region. Better transport infrastructures will improve transit efficiency, develop more cooperation, and increase regional economic integration to make Sub-African economies more globally competitive (Michel, 2021., p. 2.)

## 10.1 Suez Canal

Suez Canal is an international maritime truck route that connects Europe, North and East Africa with Asia passing through Arabian Gulf. The Suez Canal is a man-made waterway in Egypt that spans the Suez Isthmus and connects the Mediterranean Sea to the Red Sea. The canal is 193.30 kilometres long, and it takes 13 to 15 hours to travel across it. Averaging 51 vessels per day, over 18,880 vessels sailed through the canal in 2019, accounting for around 12% of total global shipping (ISTSML, 2021, p. 4.)

There had been multiple of incidents occurring within Suez Canal for the past years that have caused disruptions in global supply chain. The latest occurred in March 2021 when Ever Given was traveling from Malaysia to the Netherlands ran aground. According to weather forecasts, the winds on that day were severe, gusting up to 40 knots (74 km/h; 46 mph) the force of the heavy wind caused the head of the ship to veer off course, leaving it's bow stuck in the sediments of the southern canal (ISTSML, 2021, p. 7.)

Despite these incidents, within the zone of Suez Canal lies an ocean of business opportunity, there are six maritime port facilities three located on the northern and three on the southern side of the canal. Each port has several tugboats. In addition, one of the Egyptian shipbuilding Company Alexandria Shipbuilding (AYS) is in this zone alongside the Mediterranean Sea (SC zone website, 2023.)

Figure 18, illustrates all seaports in Egypt around the Suez canal both along Mediterranean, Red sea as well as along the Suez canal.

There is a total of six seaports in Egypt. This ports are located around the busy transport route that connects the Red sea and the Mediteranean sea.

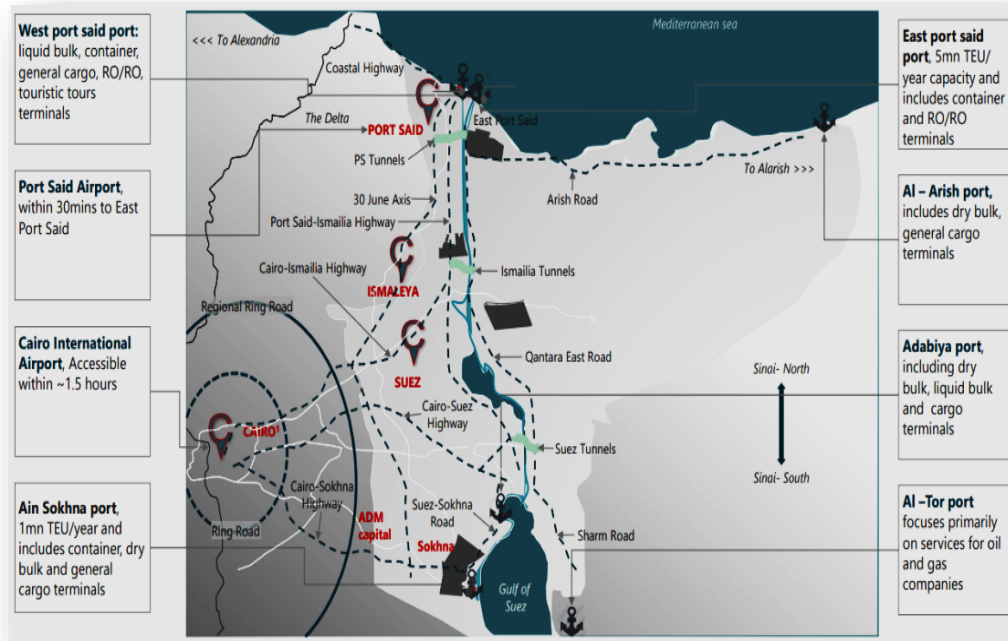


Figure 18. Egptian Seaports (SC zone website, 2023.)

Suez Canal passageway connects Europe, East and North Africa via the Suez Canal with Asia passing through Arabian Gulf serving the majority of global trade (SC zone website, 2023). Figure 19, illustrates all the routes that pass through the Suez canal when it's in operation. It also alternative route (Cape of Good Hope) when Suez canal is not in operation.



Figure 19. Suez Canal serves majority of the global trade (SC zone website, 2023.)

## 10.2 Major Seaports in Africa.

Figure 20, illustrates major seaports in 17 countries across African continent. It is noted that some countries have more than one major seaports. In addition, some of seaports do not have shipyards to handle ship repair services.

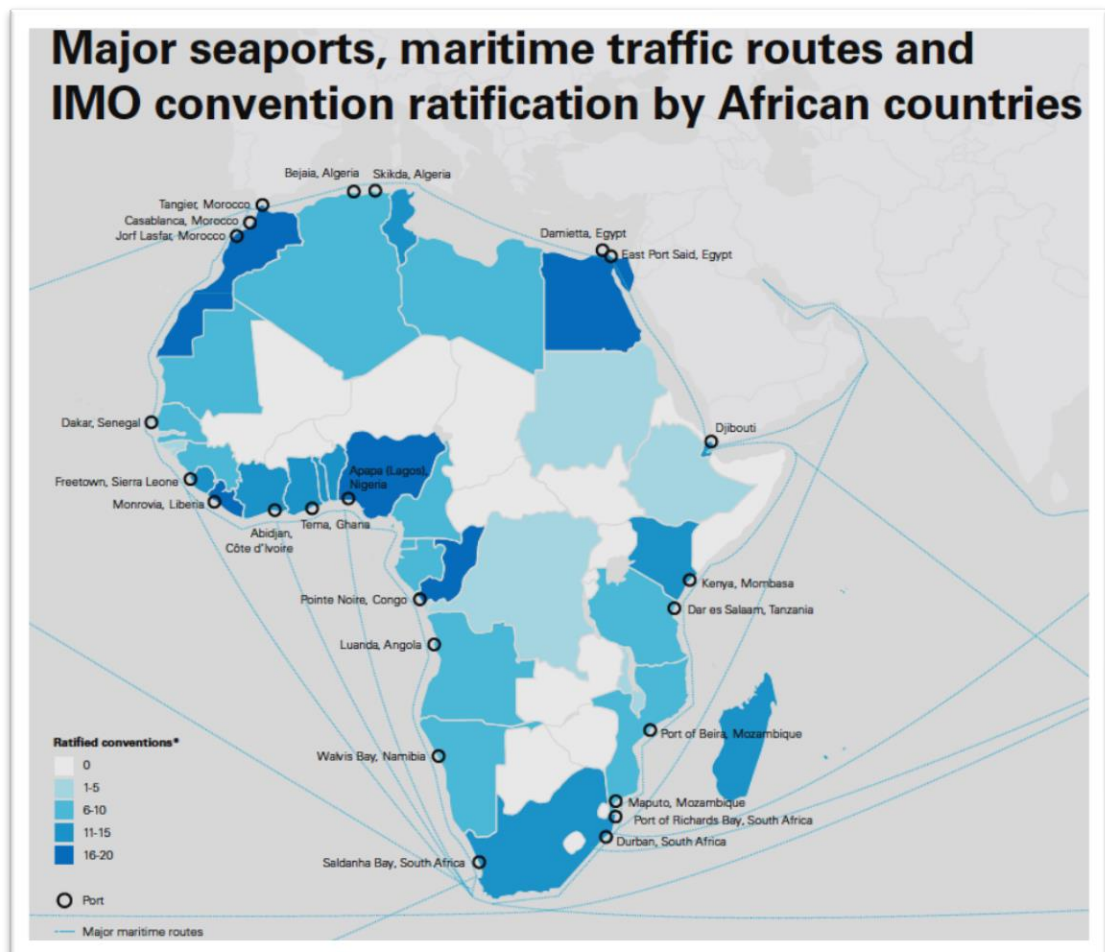


Figure 20. Major seaports (International Maritime Organization, IMO)

According to International SOS data for 2022 in figure 16, the security risks among these 17 countries are more of medium level this includes countries like South Africa, Kenya, Liberia, Mozambique, Tanzania, Kenya, Angola, Sierra Leone, Algeria and Ivory Coast. Low security risk level countries include Namibia, Morocco, and Senegal. High security risk level countries include Djibouti, Egypt, and Nigeria.

Figure 21, the overall security level risks in percentage for selected 17 countries with major seaports in Africa. Most of the countries have medium security risk level and few have high security risk level.

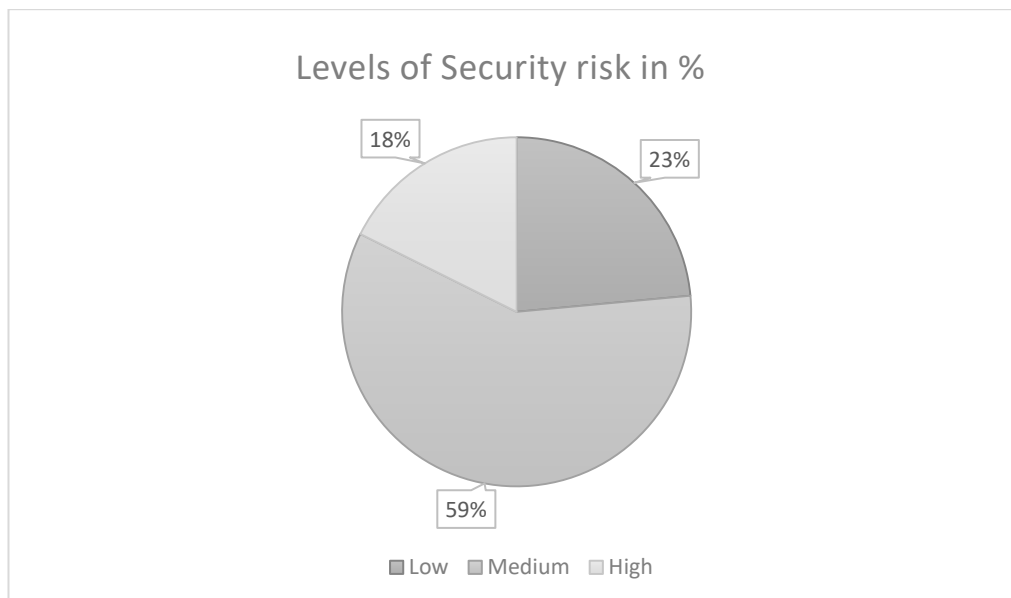


Figure 21. Overall security risk for 17 Countries with major seaports in Africa (International SOS security risk data, 2022.)

## 11. SHIPYARDS, SHIP REPAIR AND SHIPBUILDING INDUSTRY IN AFRICA

It's noted that ship repair industry is doing better in Africa than shipbuilding. Table 4 shows some countries with shipyard facilities for ship repair and shipbuilding in all areas across Africa.

Table 4. Shipyards in Africa (Shiplocation website, 2023.)

Country	Port Name	Shipyard Name	Services	Region
Nigeria	Lagos	Continental shipyards Ltd	Repairs	West Africa
		Niger docks		

		Nigeria		
Ghana	Tema	Tema shipyard limited	Repairs	West Africa
Ivory Coast	Abidjan	Carena ship repair	Repairs	West Africa
Senegal	Dakar	Dakarnave	Repairs	West Africa
Morocco	Casablanca	Chantiers Et Ateliers Du Marco	Repairs	West Africa

Country	Port Name	Shipyard Name	Services	Region
Kenya	Mombasa	African Marine and General	Repairs	East Africa

Country	Port Name	Shipyard Name	Services	Region
	Alexandria	Alexandria shipyard	New build- ings Repairs	

Egypt		Egyptian ship repairs and building	New build-ings Repairs	Mediterranean Sea
	Ismailia	Port Said Shipyard	New build-ings Repairs	Mediterranean Sea
		Timsah shipbuilding	New build-ings Repairs	Red sea
	Port Said	Canal naval constructions shipyard	New build-ings Repairs	Mediterranean Sea
	Suez	Suez Odense Marine ser- vices	Repairs	Red sea



Country	Port Name	Shipyard Name	Services	Region
South Africa	Cape Town	Damen shipyards	New buildings Repairs	
		Dormac marine & Engineering	Repairs	
		Elgin Brown & Hammer Pty. Ltd	Repairs	
		DCD Marine Cape Town Dorbyl	New buildings Repairs	
		Southern African shipyards		
		Elgin Brown & Hammer Pty. Ltd		
		Dormac marine & Engineering		

### 11.1 Overview of Maritime Services within Shipyards in Africa

Over time, maritime countries in Africa have chosen to own their ship-docking facilities for maintenance of their fleets. This enables them to provide ship maintenance and repair services to vessels trading in the territorial waters of African countries. Most of the shipyards in Africa are located in ports. In order to save operational costs, shipowners typically prefer shipyards that are close to their vessel trading routes (Khalifa et al, 2020, p.16.)

## 11.2 Overview on Ship Repair Market

The ship repair industry generates a significant number of jobs and is labour-intensive once the infrastructure needed for drydocking is in place. This is because infrastructure (drydocks) has a very long physical life and requires minimal maintenance. The demand for ship repairs is mostly a result of pre-planned or regular maintenance that ship owners must perform to keep their vessels seaworthy and compliant with IMO standards. However, five-yearly class inspections, which require drydocking, are rarely scheduled without repairs being made. In addition, the industry employs a wide range of professions in organizations that are involved in the maritime industry such as marine, mechanical, and electrical engineering, ship design and architecture, electronics, hydraulics, refrigeration, air conditioning, welding, cleaning, painting, and fire-fighting, and many more (AMTSS, 2011, P. 30.)

The location of infrastructure (drydocks, floating docks, syncrolifts, slipways, and repair quays) in ports affects the size and growth of the ability to cater for ship repair. Some of the ship repair facilities are small to cater for big international vessel repairs. South Africa's largest drydock and ship repair (Sturrock Drydock in Cape Town) has a sufficient size to accommodate large international vessels for repair works. This includes container ships of Panamax size (approximate capacity: 3000 TEU), handy size (2000 TEU), and feeder ships (500–1000 TEU), bulk carriers of Panamax size (60 000–80 000 dwt), handy size (40 000–60 000 dwt), and Panamax and small tankers (60 000dwt) (AMTSS, 2011, P. 31.)

Majority of the vessels repaired in Africa are tugboat, fishing vessels, offshore supply tugs, research vessels and navy vessels. The repair work for drilling oil rigs is done in port of Ngqura, South Africa and in Nigeria (AMTSS, 2011, P. 32, 33.)

### 11.3 Overview on Ship Building Market

Africa's ship building industry is in its developing stage compared to ship repair industry which is much wider in the region. Only few shipyards are operating in this area within the whole region. However, African governments have been striving to promote the growth of the shipbuilding sector by offering incentives to investors and creating a conducive business environment. Ships of about 5000 dwt have been built in South Africa for foreign owners, employing up to 3000 people to work in direct and indirect employment (AMTSS, 2011, P. 36.)

Kenya and Tanzania both have ports that serve as entry ways into East Africa, through Mombasa and Dar es Salaam, respectively. Both have passed regulatory frameworks and implemented measures and have launched initiatives to develop infrastructure and shipbuilding capabilities and attracting investment in multimodal connections (UNCTAD, 2022b, p. 45.)

## 12. CONTRIBUTION OF GLOBAL MARITIME SERVICES TO AFRICA'S ECONOMIES

As African economies tried to avoid recession in developed economies and the demand for commodities by China, US and Europe continued, it has been easier for them to maintain their foreign trade. There are liner companies that are specializing in serving Africa with small liners such as Safmarine, but, African market is dominated by three largest liners, i.e., Maersk line, Mitsui Osk line (MOL) and Mediterranean shipping (MSC) (MTSS, 2011, p. 16,17.)

Table 5, some top shipping companies that are currently trading with different countries across Africa. These liners are from different parts of the world and they are trading different goods, minerals and commodities with African countries.

Table 5. Some liner companies trading with Africa (MTSS, 2011, p. 16,17.)

<b>Line</b>	<b>Abbreviations</b>
<b>Maersk Line</b>	MSK
<b>Mediterranean Shipping</b>	MSC
<b>Mitsui Osk Lines</b>	MOL
<b>CHL shipping BV (Netherlands)</b>	CHL
<b>Hapag-Lloyd</b>	HLC
<b>MIS Shipping Ltd</b>	MIS
<b>Ocean Africa Container Line</b>	OAC
<b>Stella Shipping (Stella)</b>	STS
<b>MUR Shipping</b>	MUR
<b>Gear bulk</b>	GRB
<b>Shanghai Hai Hua Shipping Co Ltd</b>	HUA
<b>Canada States Africa Line</b>	CSA
<b>China Shipping Container Lines</b>	CSC
<b>Evergreen Marine Corp</b>	EMC

## 13. IMO REGULATIONS, FLEET OWNERSHIP AND VESSEL REGISTRATION IN AFRICA

### 13.1 IMO Environment Regulations

African fleets are faced with new environmental laws and fuel types by IMO, they might opt to recycle their current vessels and move to new, greener vessel. The design and building of ships are influenced by IMO environmental standards, which includes area of concern such as air pollution, ballast water treatment and double hulling of tankers. Some countries, such South Africa, Egypt, and Morocco, which have a substantial transportation networks and the

ability to provide alternative energy, are already planning to bunker greener ships. (UNCTAD, 2022b, p. 36.)

### 13.2 Fleet Ownership

There are few fleet owners in Africa. Despite decades of efforts to boost African participation in the supply of maritime services, the continent continues to rely primarily on ships that are owned by foreigners. Africa has the oldest fleets of bulk carriers, cargo ships, and oil tankers (UNCTAD, 2022b, p. 37.)

According to UNCTAD data, Nigeria tops the list of shipping fleet ownership in Africa both 2021 and 2022. Africa is one of the continents with few fleet owners in history. Table 6 presents Nigeria as a top fleet owner in Africa and has an increasing number of vessels with the national flag.

Table 6. Top shipping fleet owner in Africa (UNCTAD, 2022b, p. 37.)

<b>Country/Territory of ownership</b>	<b>Year</b>	<b>Number of vessels</b>			<b>Deadweight tonnage</b>	
		<b>National flag</b>	<b>Foreign flag</b>	<b>Total</b>	<b>National flag</b>	<b>Foreign flag</b>
<i>Nigeria</i>	2021	198	73	271	3517645	3429887
	2022	203	73	282	3521990	3976535

### 13.3 Vessel Registration Flags

According to UNCTAD, majority of the vessels are registered in developing economies. In Africa, Liberia tops the list of vessel registries while worldwide it comes second after Panama both in terms of carrying capacity and commercial value of the fleet registry. In 2022, the Liberian flag registered the highest increase in fleet value share of 2.2 percentage points. A total number of 3942 vessels were registered in 2021 and 4311 vessels were registered in 2022 under Liberian flag (UNCTAD, 2022b, p. 41, 42.)

Africa has one of the largest ship registries in the world. There is different type of vessels that are registered under the flag of Liberia. Figure 22 presents the number and vessel types that are registered as of 1 January 2022.

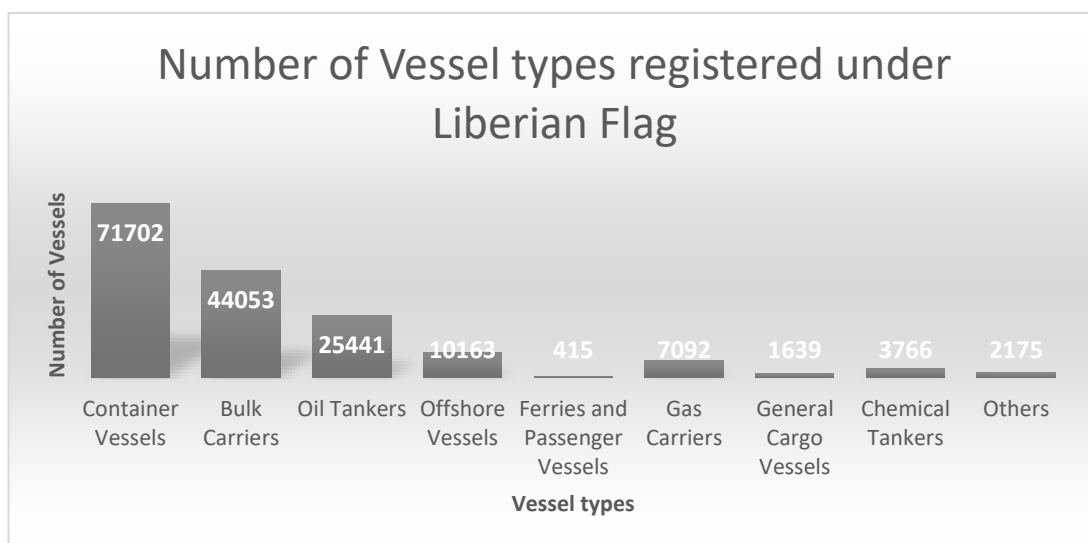


Figure 22. Number of Vessel types registered under Liberian flag (UNCTAD, 2022b, p. 41, 42.)

## 14. BUSINESS ENVIRONMENT IN AFRICA

There is an estimated number of 2 billion people increase in the world's population by 2050. Sub-Saharan Africa is predicted to see more than half of the

population growth (UNDESA, 2019, p. 1). Although, there are already more than 300 million people living in Southern African Development Community (SADC), the population is expected to grow by 2.9% annually (SADC, 2017, p. 2). Consequently, several SADC members states and other non-SADC countries face difficulties, and these countries want assistance to improve their maritime industry, renewable energy, and many other sectors.

SADC and other Africa's countries are developing marketplaces with a demand for high-tech goods and services. Although Namibia offers a relatively small market, it serves as a gateway for enterprises looking to grow in the SADC region. The marketplaces in Africa are expanding and are ready, wide open, and diverse. New product innovations in marketing strategies are required (Keinänen-Toivola et al., 2019, p. 11.)

Being customer-centred is essential for businesses to flourish in today's increasingly competitive marketplace. Businesses must seek favour from customers with the aim to take them away from the competitors and keep them interested, engaged, help them meet their needs, develop, and strengthen customer relationship by offering superior service and quality products. Understanding customer needs and wants is necessary for satisfying customers, hence careful customer analysis is necessary for effective marketing. It can be challenging for certain companies to meet the needs of various customer categories, as a result some companies serve some of their business segments much better than others (Kotler & Armstrong, 2021, p. 68-69.)

Figure 23 illustrates a map for Southern Africa Development Community (SADC) member state countries. Most of the countries are landlocked and they entirely depend on countries other countries for maritime goods transportation.



Figure 23. SADC countries (SADC website, 2023.)

## 15. RESEARCH DESIGN

### 15.1 Methodology

This section outlines the approach used to investigate business opportunities in Africa. The methodological section of the study introduces the realities of conducting research, including potential business opportunities in Africa, typical challenges, discussing the challenges that are most frequently encountered when conducting aftermarket services in Africa. The study of research methodology enables us to comprehend the proper conduct of research as



well as the implications of the theoretical and philosophical presuppositions on which the research is founded (Saunders et al., 2009, p. 3).

Qualitative research method is appropriate for aftermarket business research, because it allows open questioning and exploratory analysis of the research subject. Qualitative research enables a study to identify its environmental context and establish meaning from its data, enhancing the study's accuracy. The study was conducted using single case study research approach. The research was conducted utilizing an inductive methodology, whereby data and theory are evaluated concurrently throughout the data gathering phase, and the research data are then interpreted using a theme analysis (Doz, 2011, p. 582-590.)

## 15.2 Qualitative Research method

Qualitative research depends mostly on people observing, interacting with, and conversing with one another (Patricia, 2014, p. 27-28). Interviews conducted for qualitative research are more open in order to comprehend the interviewee's perspective and the context in which they are understanding the main topic (King, 2004, p. 54.)

Respondents were free and open during interview discussions regarding the questions about the topic the researcher has chosen, offering their opinions and experiences. In this way, the data can be used to develop theories and fresh ideas (Eisenhardt, 1989, p. 532-550).

## 15.3 Case study research

Case studies are most effective when utilized to answer research questions about the company's operations and environment (Hartley, 2004, p. 323-333). Additionally, Case studies can also be analysed at various levels depending on the subject of research (Yin, 2003, p. 18). This bachelor's thesis is a single-case study because the enhancement of aftermarket business is the primary

focus of the research. This was accomplished through a combination of theory and in-depth interviews with staff members of the case company. Case study is a significant approach to research and a good evaluation strategy.

The purpose of the first question (What do customers value in the aftermarket?) of this study is to provide an overview of the relevance of the aftermarket industry and determine what customers value in the aftermarket business. The research's second question (What factors to consider if Kongsberg Maritime plans to expand in Africa?) aims to give advice to Kongsberg Maritime deck machinery anchoring, mooring and towing winches department about what factors to consider when they want to expand within Africa. The final query (What challenges Kongsberg Maritime is facing when conducting aftermarket services in Africa?) aims to emphasize on the challenges faced by Kongsberg Maritime when conducting aftermarket services in Africa.

#### 15.4 Data collection

In data collection, there are some of the methods that are used in qualitative research to acquire data such as through In-depth interviews, focus groups, direct observation, document reviews, and audio recording reviews (Betancourt, et al., 2016, p. 169, 191-198). These methods can give researchers a deeper insight of the study than is possible with quantitative methods alone (Patton, 2002, p. 24).

##### 15.4.1 Document analysis

According to Bowen (2009, p. 32) document analysis is a methodical process for examining or assessing documents, including printed and electronic materials. Document analysis includes reading, interpreting, and skimming.

This iterative procedure incorporates aspects of categorizing data in relation to the main research being explored. According to Burton et al. (2014, 113) show that content analysis can be quantitative and qualitative forms.

Although documents can be a rich source of information, researchers should use caution when utilizing documents in their studies and examine them critically. The initial goal of documents, the reason behind their creation, and their intended audience should all be taken into account by the researcher. When evaluating a document, details regarding its author and the information's original sources may also be useful.

#### 15.4.2 Semi-structured interviews

Given that most case studies are concerned human affairs, interviews are a valuable source of evidence for case studies. Reporters covering human affairs should see things from the perspective of the people they interview; knowledgeable responders can offer crucial context for a given scenario. They can also offer quick access to the situation's past, assisting the researcher in finding other pertinent sources of information. Nonetheless, the interviews should be regarded as verbal reports solely. As a result, individuals suffer from the widespread issues of bias, forgetfulness, and faulty or poorly articulated speech. Thus, combining information from different sources with interview data is a good strategy (Yin 1994, 84-85.)

For this thesis work, the main source of data were interviews, done by interviewing the case company's staff members. The interviews were done either face-to-face and through the MS teams.

The selected group of people to be interviewed are employees who have aftermarket functions as part of their job duties. Questions were sent to them via

email before the interview. Table 7 presents information about the interviews conducted during the study.

Table 7. Interview respondents

Interview date	Duration	Job title	Location
20.09.2023	1h15	Spare part sales team Leader	Rauma, Finland
29.09.2023	1 hour	Forwarder and Invoicing	Rauma, Finland
29.09.2023	1 hour	Upgrades Sales Engineer	Rauma, Finland
09.10.2023	1 hour	Managing Director	Walvis Bay, Namibia (Africa)

The interviewees who were physically close were interviewed face-to-face, while one of them was interviewed via MS teams at their discretion and at a time of their choosing. Semi-structured interviews give a general direction for the interview but also give the correct amount of flexibility to acknowledge other point of views and ask more in-depth questions on topics that come up during the process.

At first, a number of general questions were drafted which in my perspective felt applicable to be addressed to selected personnel that engage with after-market activities in the case company. Before questions were sent to the right people, they were first presented to my manager and if there was an irrelevant question, it was advised to remove it. Prior to the interview, an email was sent to the participants informing them of the research topic, objectives, and questions.

Depending on the respondents' responses, the interviews lasted anything from one hour to an hour and fifteen minutes. This is influenced by the information given and the extent to which they can share information.

The case company's respondents were not hesitant to express themselves and give their honest opinions, which resulted in extensive and rich data.

## 16. RESEARCH FINDINGS

### 16.1 Interview findings

Regarding the research findings, the researcher conducted interviews with participants during the study. The questions were addressed to Kongsberg Maritime team members in Rauma and at Walvis Bay. Every interview participant was asked questions related to their roles within the aftermarket business of the case company. Every query was addressed. The following were the outcomes:

#### 16.1.1 Rauma interview findings

In Africa, most spare parts shipments are done to Namibia, south Africa, Djibouti, Nigeria and Egypt. Most of these spare parts are for thrusters. Some customers prefer some of their winch spare parts to be delivered to South Africa when embarking their journey to Africa. Customs procedures can have an impact on spare parts deliveries to customers. Some countries require certificate of origin i.e. Eur1 certificate. Kongsberg Maritime provides a Free Trade Agreement statement (FTA). Some countries have very strict recruitments and some have normal.

Country like Egypt, requires a chamber of commerce stamp for spare parts to go through. Country like Ghana, have strict government legislations which can cause payment problems between Kongsberg Maritime and their clients in that country. It's noted that there are few fleet owners/managers in Africa, therefore, spare parts are mostly delivered at ports or at anchorage depending on client's choice.

Rauma products centre is one of the products centres that offer support like technical, and spare parts support to Africa. Whenever there is a critical problem, it's either a service engineer will travel to Africa or else the problem is solved remotely via a phone call. The problems are mostly solved are related

to vessels like tugs boats. Fishing vessels are carried out by local Kongsberg Maritime service centres. The training for crew members is mostly provided when Kongsberg Maritime service engineer is doing some service or upgrade works normally, by following and asking questions what the expert is doing.

However, for shipyards there is an official scheduled training programme for training. In terms of safety, when service work is done in a country with unfavourable security risk Kongsberg Maritime service engineer is provided with security by customer. It's noted that it's costly when sending Kongsberg Maritime service engineer to Africa plus it involves quite a lot of paper work (immigration) when embarking a journey to Africa.

#### 16.1.2 Walvis Bay Interview findings

Kongsberg Maritime Namibia team usually travel to some countries in Africa mostly targeting where the main ports and docking locations are. The team usually visit seaports for countries like south Africa, Cote d'Ivoire, Nigeria and Algeria visiting all the clients. Namibia service centre is responsible for serving all customers across Africa in products like thrusters and winches.

According to the managing director for Namibia and sales manager for Africa, the market for winches in Africa is challenging to get into compared to the thruster's market and this is because there are a lot of local hydraulic companies that can-do winch overhauls and repairs. Fishing vessels normally have low pressure hydraulic winch drive type which is quite simple to any hydraulic company to service it. About 60 tugs under South African ports Authority have signed an agreement with local companies to be doing overhauls of winches on their tugs. Although Kongsberg Maritime team in Africa have done some winch works which are mostly on controls this includes calibrations, supply of spare parts for upgrades, load and pick up sensors. The only growth that can be seen in the winch market is when getting offers on older control systems for new upgrades.

Kongsberg Maritime team in Africa generally order spare parts from Kongsberg Maritime product centres. The most used mode of transport for spare parts delivery is air freight. In addition to spare parts, Rauma product centre provide also technical support and product training.

## 17. DISCUSSIONS AND CONCLUSION

The purpose of the study was to find out factors that can hinder the case company when conducting aftermarket services in Africa. And also, to investigate business opportunities in Africa's maritime industry. The case company is operating in maritime business globally. The research confirmed that there is a huge potential in the untapped market for thrusters in Africa.

The following are the answers to the research questions and they are all answered based on research and interviews:

### **What do customers value in the aftermarket?**

Both customers have similar opinions about the important issues that the aftermarket should address, despite the fact that they handle their aftermarket needs differently. The aftermarket industry is highly competitive because there are small local companies that provide the same services as overhauls, repairs, and spare parts at lower prices than original equipment manufacturers or primary product sellers who negotiate discounts for aftermarket goods, services, and warranties.

These local companies have lower prices which allow customers to purchase spare parts and other services which are not from the original manufacturer. But, because it's attractive due to price, accessibility and availability. So, generally, customers value time of response during their breakdowns, price, technical support and accessibility of aftermarket products and services.

On the hand, the research reveals that there is a close relationship time to time between Kongsberg Maritime team in Africa and their customers. According to the Managing director, stated that the team normally visits all the local clients in different ports across Africa that have Kongsberg Maritime products onboard their vessels and ask the issues they have with the products. And clients really appreciate this.

### **What are the factors to be considered when Kongsberg Maritime wish to expand to other parts of Africa?**

One of the factors the research has revealed is that there's a lack of competency among graduate engineers and current labor force in Africa's maritime industry. The researcher's academic supervisor, Jarno Laine who have trained some labor force from different stakeholder companies in Namibia have highlighted some weakness in terms of skills among Namibia's Maritime industry. On the other hand, the managing director for Kongsberg Maritime Namibia have suggested that safety and stability of the country, and client base and docking opportunities are the two main factors to be considered first. These factors will be explained in details in recommendations section.

### **What challenges is Kongsberg Maritime facing when conducting after-market services in Africa?**

The study revealed that African continent have some countries with high or even extreme security risks which can threaten the lives of the mobile workers. Therefore, for safety reasons, Kongsberg Maritime service engineer is provided with security services by customer to and from the location where customer service is to be delivered. Customs clearance also plays a major role in delivery of spare parts to customer, some countries require paper works just for spare parts to get to customers. Some African countries have strict government legislations that can cause payment problems and delays before approval. On the other hand, it's quite expensive to send Kongsberg Maritime service engineer to Africa plus there is a lot of paper works (immigration) involved in the process.



**Main topic: What are the business opportunities in Africa?**

Despite lack proper level of competency Africa's Maritime industry, there is huge potential of business opportunities in Africa. Most of African countries have realised the potential in the maritime industry therefore, they are open to new investments to improve their maritime infrastructures, maritime education and investing in skills to improve their workforce. African Maritime institutions are open to international organizations that are willing to partner with them for maritime trainings, latest technology such PLCs and automation systems and maritime training simulators to improve their teaching facilities.

The biggest fleet owner in Africa, Nigeria, it is noted that its maritime industry heavily depends on oil and gas industry and the research revealed that it's one of the biggest clients for Kongsberg Maritime in Africa. It will be of no difference to Namibia's recent oil and gas discovery. Namibia's oil and gas industry will propel the country's maritime industry to new heights of which it will give rise in aftermarket services and other new opportunities.

On the hand, the ship repair industry is more attractive in Africa than shipbuilding industry. Every African country with a major seaport has shipyards within their ports for ship repair services. The ship building industry in Africa is still developing and is currently dominated by Egypt and South Africa.

The research has revealed that Egypt and South Africa are countries that are located at strategic locations where major maritime routes have passed through. It's further noted that these countries have more than one major seaports. It's quite interesting for the case company to keep a close eye to these regions and see what opportunities are there.

The study involved a lot of in-depth analysis just to get main idea on how Africa's maritime industry operates and the goal was to find an answer to the main topic: "what are the business opportunities in Africa?"

The theoretical part of the thesis was based on secondary information which are gathered mainly from books, but also from various internet sources.

The empirical portion of the study was based on semi-structured interviews and secondary data analysis served as the foundation. The purpose of the interviews was to obtain additional insight into the aftermarket industry in Africa. The secondary data was utilized to obtain a general overview of the company's products and services, including the locations of its service centres throughout the continent. The company's intranet, website, and documents served as the primary sources of secondary data. The interviews lasted an hour or longer, which were all very interesting and enjoyable. The researcher's case company supervisor participated in all interview situations. The researcher was able to collect enough information for his study to answer the research questions and to achieve the research objective.

### 17.1 Recommendations

The research and interviews have confirmed that there's a huge potential in Africa's maritime market especially for thrusters either the primary product or in the aftermarket business. However, there is a need for competency in Kongsberg Maritime products for every individual involved especially in the field service part. It might be the best if the case company consider expanding to other parts of Africa. The target should be to invest in training of people in that specific country to enhance their knowledge and gain better competency at the case company's products. The case company should focus on training few individuals from this region to the level of speciality in the company's products. The research has revealed that there is a gap in the level of competency in Africa's maritime industry in general. There is a need to invest more in service and maintenance, automation, PLCs and there is a lack of exposure to best educational maritime tools and software's such as simulators. This will help the case company to cut costs when sending specialists to Africa and saving time for sorting out immigration paper works as part of the process.

Safety and stability of the country, client and docking opportunities are other factors to be considered, Nigeria is a one of the good examples with unstable security risk in Africa. Yet its oil driven economy makes its maritime industry more attractive in fact, it's the biggest fleet owner in Africa. Therefore, it seems

that there can still be progress in terms of business with these factors put into consideration on every move. The researcher suggests that the expansion could be possible to other parts of Africa such as Egypt, Djibouti, Kenya, Tanzania, and Mozambique.

It's an advantage that majority of African countries with major seaports are visa free for Namibians, some issue visa upon arrival while others issue electronic visa.

Countries that have strict government regulations for customs clearance and other legislation that can cause payment problems the case company need to negotiate with that specific government body that deals with such cases so smooth trading can be allowed.

## 18. SELF-REFLECTION

The researcher found the thesis topic to be very interesting as He was eager to know more about the case company. The researcher did not struggle with time management during the entire time of the thesis. The researcher was privileged to start his thesis during his summer training period because he was able to collect all the information needed for the thesis. In addition, the researcher had a good opportunity to enquire and have some discussions with the case company staff members and held interviews with the right people that have aftermarket as their job functions through his manager. All these made it easier for the researcher to analyse and identify trends within the research during the study. The research was divided into series of topics and each was addressed at a time: introduction, theory, interviews, results, conclusion and recommendation.

## 19. SUGGESTIONS FOR FUTURE RESEARCH

The research highlighted some two additional areas for further research. One is to consider the same aftermarket services for different products that Kongsberg Maritime offers to customers in this region. The researcher considers this as worth knowing because there are some products that have more customers in this region than others i.e. more propulsion products are served in this region. It is worth knowing from customer's point of view on what matters to improve and making sure customer relationship is maintained.

The last area is evaluating skills within the maritime industry from engineering point of view in Africa. The researcher considers this aspect to be interesting because Kongsberg Maritime's aftermarket services offers a wide of service engineers and technicians. These positions demand a high level of competency to every individual engaged with them. Throughout the study researcher revealed some weakness in terms of skills that one need to competency plus at some point, it's even a struggle to get proper basic trainings in Africa.

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## APPENDIX 1:

### **Internal interview questions (Kongsberg Maritime Finland Oy, Rauma product centre)**

The purpose of the interview is to gain extra insight about aftermarket services that Kongsberg Maritime offers to their clients worldwide, but in this case the focus is on Africa's region. Could you give me an overview on what you normally encounter when performing aftermarket services in Africa, either doing upgrades or field service works.

#### Questions for upgrades and service

1. Do you normally do upgrades/field service in Africa? How often?
2. The upgrade you have done, was it on African localized vessel or an international vessel that experienced a brake down in this region?
3. Do you/have you provided training to customer's crew members in Africa regarding upgrades/service and maintenance on the products?
4. In your opinion, is field service works/upgrade works less or is it growing in this region? Are more customers coming on board compared to any other region?
5. Is it easy to coordinate field service/upgrade works to Africa?
6. Do you think there will be a potential growth in the aftermarket business in this region someday?

#### Questions for Spare parts

1. Can you please explain to me the way of distributing spare parts, how do they reach Africa? Spare part coordinator? Warehouses?
2. How do you receive call from Africa is there a channel for them? /how often? /is it easy to channel them this side?
3. According to your experience, was there a delay in spares reaching customers on time?
4. According to your experience, when you receive calls from Africa, is it from a local vessel or international vessel?
5. What mode transport you use to get spares to Africa? Is it easy for DHL (does DHL also have transit facilities in Africa) or airfreight? Delivery order delay?
6. In your own opinion, do you think there will be a potential growth in the aftermarket business in this region?

## Kongsberg Maritime Namibia, Interview questions

Hello,

My name is Elias Haunawa, I am studying Marine Engineering at Satakunta University of applied sciences (SAMK), Rauma, Finland. This research is part of my final academic work, the Thesis. The research is focused on Kongsberg Maritime deck machinery products, to be specific, **the Anchoring, Mooring and Towing winches (AMT)**. The purpose of this research is to find out the challenges you normally encounter when providing aftermarket services to customers across Africa. I appreciate you in taking time to answer the following questions for my Research.

1. What are the most common issues with Kongsberg Maritime Anchoring, Mooring and Towing winches?
2. How do you maintain customer relationship? what do customers value the most in Kongsberg Maritime aftermarket services?
3. How do spare parts get to customer upon their request? Do you have a spare part coordinator? Apart from the lead time that might be longer than expected because of the availability of the item in the warehouse, do you experience any other delay in delivery of spare parts? Maybe with customs clearance.
4. Are all customer's crew members trained on how to operate Kongsberg Maritime Anchoring, mooring and Towing products onboard their vessel?
5. Do you have product specialists for all wide range of aftermarket services? Or was there some time you requested one from any other Kongsberg Maritime facility/office around the world? If so, long does it take for the service to be delivered to customer?
6. In your own opinion, is the aftermarket business improving in Africa?
7. What aftermarket services do you mostly offer?
8. Customers that you normally give services to, are they originally from Africa or is its international vessels that are experiencing breakdowns in Africa?
9. Is the service facility also responsible for offering aftermarket services to all customers across Africa?
10. What assistance do you get from Rauma, Finland?