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WORLD MARITIME UNIVERSITY

Malmö, Sweden

**SHIP RECYCLING IN GHANA; AN
ANALYSIS OF THE IMPLEMENTATION OF
THE HONG KONG CONVENTION, 2009**

By

**NII LANTEI KUMI-BRUCE
GHANA**

A dissertation submitted to the World Maritime University in partial
fulfilment of the requirements for the award of the degree of

**MASTER OF SCIENCE
in
MARITIME AFFAIRS
(MARITIME LAW AND POLICY)**

2021

Declaration

I certify that all the material in this dissertation that is not my own work has been identified, and that no material is included for which a degree has previously been conferred on me.

The contents of this dissertation reflect my own personal views, and are not necessarily endorsed by the University.

(Signature): 

(Date): **21st September, 2021**

Supervised by: **Prof. Dr. Henning Jessen,
LLM.**

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University**

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Abstract

Title of Dissertation: **Ship Recycling in Ghana; An Analysis of the Implementation of the Hong Kong Convention, 2009**

Degree: **Master of Science**

The dissertation analyses international Conventions on ship recycling, specifically the Hong Kong Convention for the Safe and Environmentally Sound Recycling of Ships, 2009 (HKC), that Ghana has ratified and national regulatory frameworks for ship recycling. The analysis focuses on key obligations of the HKC and compares them with the obligations of Ghana's regulatory framework for ship recycling.

The research examines the current situation of ship recycling in Ghana, the existing regulatory framework for the ship recycling industry and the implementing Government agencies for this framework such as the Ghana Maritime Authority. It thereafter deduces the lapses in the country's regulatory framework for ship recycling upon a legal comparative analysis with key obligations of the HKC. This forms the basis for the identification of likely challenges to the full implementation of the Convention, upon which it provides recommendations for in the final chapter.

The recommendations bordering mainly on the development of the current regime through the adoption of a law that fully implements the HKC with its obligations consisting of comprehensive guidelines and requirements, properly aligns the existing national regulations in Ghana with the international regulations regime and thus ensuring compliance to international standards.

KEYWORDS: Ghana, ship recycling, ship recycling industry, regulatory framework, legislation, Convention, adoption, implementation, hazardous materials.

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List of Abbreviations

BC	-	The Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal or Basel Convention, 1989
CA	-	Competent Authority
EC	-	European Commission
ECOWAS	-	Economic Community of West African States
EEA	-	European Economic Area
EEDI	-	Energy Efficiency Design Index
EMSA	-	European Maritime Safety Agency
EPA	-	Environmental Protection Agency
ESM	-	Environmentally Sound Management
ESSD	-	Environment and Safety Standards Department
EU	-	European Union
EUL	-	European List of Ship Recycling Facilities
EUSRR	-	European Union Ship Recycling Regulations (Regulation (EU) No 1257/2013)
GHG	-	Greenhouse Gas
GMA	-	Ghana Maritime Authority
GT	-	Gross Tonnage
HKC	-	Hong Kong Convention for the Safe and Environmentally Sound Recycling of Ships, 2009
HSE	-	Health, Safety and Environmental
IFC	-	International Finance Corporation
IHM	-	Inventory of Hazardous Materials
ILO	-	International Labour Organization
ILOG	-	The International Labour Organization Guidelines – Safety and Health in Shipbreaking: Guidelines for Asian countries and Turkey (2004)
IMO	-	International Maritime Organization
IRRC	-	International Ready for Recycling Certificate

LDT	-	Light Displacement Tonnage
MARPOL	-	International Convention for the Prevention of Pollution from Ships
MLC	-	Maritime Labour Convention
MOT	-	Ministry of Transport
M&E	-	Monitoring and Enforcement Unit
NGO	-	Non-Governmental Organization
OSH	-	Occupational Safety and Health
PIC	-	Prior Information of Consent
PPE	-	Personal Protective Equipment
SBP	-	NGO Ship Breaking Platform
SD	-	Survey Department
SEEMP	-	Ship Energy Efficiency Management Plan
SENREC	-	Safe and Environmentally Sound Ship Recycling
SOAAG	-	Ship Owners and Agents Association of Ghana
SOLAS	-	International Convention for the Safety of Life at Sea
SRF(s)	-	Ship Recycling Facilit(y)/(ies)
SRFP	-	Ship Recycling Facility Plan
SRI	-	Ship Recycling Industry
SRP	-	Ship Recycling Plan
STCW	-	Standards for Training, Certification and Watchkeeping
TBM	-	Transboundary Movement
UN	-	United Nations
UNCLOS	-	United Nations Convention on the Law of the Sea
UNEP	-	United Nations Environment Programme
VTMIS	-	Vessel Traffic Management Information System

1. Chapter 1: INTRODUCTION

1.1. Background and Problem Statement

Background: Ghana is an English-speaking West African country spanning about 238,500 square kilometers and with a population of over 30 million as at 2018 (Fage et al., 2021). The country has a tropical climate and is bordered by Burkina Faso in the North, Togo in the East, Côte d'Ivoire in the West and the Gulf of Guinea and the Atlantic Ocean in the South with many sandy beaches along its beautiful coastline (Fage et al., 2021).

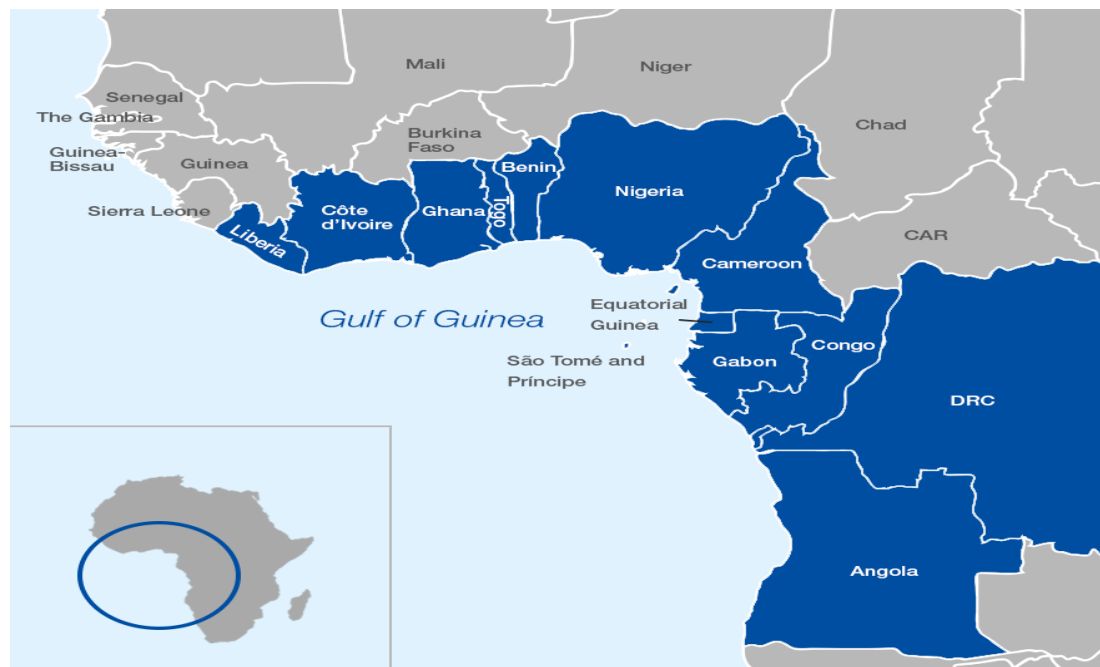


Figure 1: Map of Ghana and other neighbouring countries in the Gulf of Guinea (Okafor-Yarwood et al., 2021).

Ghana's rivers, inland lakes and more importantly offshore waters are major resource bodies for fish and other marine life such as sardine, tuna, mackerel and barracuda (Fage et al., 2021). In Ghana's coastal zone, fishing serves as the most important activity, providing employment and a source of income for many (Hilmi, 2019). Over 90% of the country's exports and imports are transported by shipping and in 2018 alone, total transshipment trade volumes grew by 0.2% as compared to 2017 (Hilmi,

2019). Some of Ghana's main industries are food processing, beverage production, mining, lumbering, aluminium smelting and steel product manufacturing (Fage et al., 2021). Metal smelting and processing is a major contributor to the country's formal industrial sector while scrap metal recycling serves as one of the most common industries of the informal sector (Dowling et al., 2016).

The ship recycling industry (SRI) is a supply source to Ghana's steel product manufacturing industry. In specific coastal areas of Ghana, like Prampram in the Greater Accra Region, ship recycling occurs along certain portions of the coast and is mainly undertaken by the private sector. The proximity of Prampram to Tema (Darko et al., 2021), one of the country's biggest industrial areas, where one of Ghana's two major ports is situated, serves as the basis for cheap transportation of scrap from the recycling sites to a ready market.

Ship recycling in Ghana is conducted with permission and supervision from the Government authorities, primarily the Ghana Maritime Authority (GMA) an agency under the Ministry of Transportation (MOT) with the mandate to coordinate, monitor and regulate the maritime sector (Environmental Protection Agency [EPA], 2016).

Globally, ship recycling activities undertaken in an improper and unsafe manner has had a major impact on the environment and people, resulting in injuries, illness and death (Du et al., 2018). The hazardous substances in these vessels upon exposure can make workers sick and have damaging effects on the soil, marine environment and marine life (Gourdon, 2019). As at 2017, about 60% of ship recycling was undertaken using the beaching method, a highly dangerous and hazardous process that involves the grounding of the ship close to the beach during high tide (Pham, 2019).

Ghana with the lack of proper ship recycling facilities (SRFs) such as a drydock, wharf or even slipway, until date employs the use of the beaching method. Regardless of the impact caused by ship recycling operations, halting shipbreaking activities in Ghana

would have an adverse effect on the livelihood of these people by cutting their supply of income and thus leading to unemployment, supply shortage to factories that need scrap metals and cessation of revenue generated from taxes and issuance of ship recycling permits. This will stifle a growing industry with the potential for foreign investment and growth.

The general impact of ship recycling has been a major concern for the international community and led to the establishment of the Basel Convention on the Control of Transboundary Movements of Wastes and their Disposal 1989 (BC), the International Labour Organization Guidelines for Safety and Health in Shipbreaking: Guidelines for Asian countries and Turkey 2004 (ILOG), the Hong Kong Convention for the Safe and Environmentally Sound Recycling of Ships, 2009 (HKC), and the European Union Ship Recycling Regulations 2013 (EUSRR). These were developed by the Secretariat of the Basel Convention (SBC), the International Labour Organization (ILO), the International Maritime Organization (IMO), and the European Commission (EC) respectively (Argüello, 2016).

These international Conventions, Regulations and Guidelines, although unique, do not stand in isolation but complement each other, with the HKC being one of the most recent and highly relevant international Conventions setting out a compulsory regulatory framework to be followed by its Parties engaged in ship recycling activities (Gourdon, 2019). The HKC has not been entered into force however many countries that engage in ship recycling have begun taking steps to meet the obligations and standards prescribed by the Convention (Pham, 2019). Ghana is one of such countries.

Ghana is a Party to the United Nations Convention on the Law of the Sea (UNCLOS) and is therefore obliged to protect and preserve the marine environment (Global Initiative for West, Central and Southern Africa [GIWACAF], 2010). The country also became a member of the IMO in 1959 (International Maritime Organization, n.d.) and has been active in the development, implementation and enforcement of IMO Conventions such as the International Convention for the Safety of Life at Sea (SOLAS), Standards for Training, Certification and Watchkeeping (STCW),

International Convention for the Prevention of Pollution from Ships (MARPOL) and the Maritime Labour Convention (MLC). The country became a Contracting Party to the HKC in 2020 as stipulated in IMO Circular HKSRC.1/Circ.14, paving the way for the development of policy, standards and laws to enhance its legal and administrative framework that is critical in regulating and developing its SRI.

Problem Statement: Ghana currently lacks a specific law for ship recycling and its existing laws that pertain to hazardous waste and environmental pollution have not been adequate in optimizing the regulatory capabilities of the GMA and its collaborative stakeholders. This has hindered the efficient management of the negative impact of the industry and limited the country's capacity to boost the development of an attractive SRI that would foster maritime development and contribute to Ghana's economic growth.

The absence of a law that fully implements the HKC means that there is no international standardization of ships and SRFs in the country. Although this and other factors have motivated Ghana's move to become a Contracting Party to the HKC, the current capacity of Ghana as a developing country to successfully reform its SRI by the development of its current regulatory framework through the implementation of the obligations of the HKC has not been fully ascertained, thus leaving room for some ambiguity and possible setbacks in its execution. In addition, the challenges hindering the effective implementation of the HKC have not been fully researched.

1.2. Objectives, Research Questions and Expected Results

The aim of this research paper is to understand Ghana's regulatory framework for ship recycling and using the HKC as a benchmark, deduce the lapses between both, the challenges to the full implementation of the Convention and recommendations to be able to effectively and efficiently implement the HKC prior to and upon its adoption as part of Ghana's national law.

Objective: The objectives below have been set out in accordance with the aims of the research paper;

- a. To identify whether the obligations of the HKC have been implemented in Ghana.
- b. To identify the challenges that have prevented the implementation of the obligations of the HKC in Ghana.
- c. To identify recommendations that would help in addressing these challenges in order to ensure the full implementation of the HKC.

Research Questions: The following research questions need to be answered in order to meet the set out research objectives;

- a. What HKC obligations have been implemented by Ghana?
- b. What challenges have prevented the implementation of the HKC obligations?
- c. What recommendations would help in addressing these challenges in order to ensure the effective implementation of the HKC?

Expected results: This research document is expected to give the Government of Ghana through the GMA a clear understanding of the lapses between the country's regulatory framework for ship recycling and the HKC and thus serve as a guide for further consideration in the development of its legislation being established to fully implement the HKC and by so doing bring its regulatory activities on par with international standards. It will also give stakeholders a clear understanding of the legal framework concerning ship recycling and the direction of the nation in attaining best practices and meeting international standards that is critical in projecting opportunities for business, the growth of the maritime sector and Ghana's economy.

1.3. Research Methodology

The research will be undertaken by a comparative legal analysis of international Conventions or more specifically key obligations of the HKC and Ghana's regulatory framework for ship recycling. The research will be conducted through literature review

and would involve the collection of qualitative data using methods such as; Maritime Conventions, Circulars, Reports and Publications, Peer-Reviewed Journals and Public Documents and Official Reports from Government Agencies specifically the GMA since it is the main agency responsible for implementing maritime related standards and requirements provided by the national laws and international Conventions. The implementation challenges will be deduced from the literature review and comparative analysis and thereafter used to derive final recommendations.

1.4. Key Assumptions and Limitations

Key Assumptions: A key assumption of this research paper is that Ghana's accession to the HKC was spurred on by the limitations in the country's current regulatory regime due to the lack of specific comprehensive legislation for regulating the country's SRI. Another assumption is that the country ratified the HKC in order to develop its current regulatory framework to an adequate level of compliance with international standards.

Limitations: Although the research makes reference to some national laws and regulations of Ghana that gives the GMA and other State agencies the mandate to regulate Ghana's maritime domain and also to regulate hazardous waste and environmental protection in the country respectively, the research will not fully analyze them since they do not have specific and detailed coverage over ship recycling. The research will focus primarily on the analysis of Ghana's regulatory framework for ship recycling as established, prescribed and implemented by GMA, which is the implementer and executor of international Conventions and laws that govern Ghana's maritime domain.

In consideration of international Conventions, Regulations and Guidelines that pertain to ship recycling, the research will only highlight a general overview and structure of the BC, HKC, EUSRR and ILOG in addition to their ratification by Ghana. However,

it will go further to make a detailed analysis of key obligations of the HKC since it is the main Convention under consideration. Besides GMA, the research does not focus on data from any other relevant Government agency or key stakeholder in the industry although it will describe their roles and mandates. This research will not provide an analysis of the construction and design of ships and recycling facilities. It will also not cover the economic aspects of Ghana's SRI.

2. Chapter 2: THE SHIP RECYCLING INDUSTRY

2.1. Definition of Ship Recycling

Ship recycling, also termed as ship breaking, ship demolition, ship dismantling or ship scrapping (Argüello, 2016) is the process of recycling a ship at the end of its life span, usually an average of 20 to 30 years (Hougee, 2013). This includes the disassembling of steel and other recyclable materials from the hull structure to the machinery of vessels that have reached their end-of-life for recycling purposes (Gourdon, 2019) and involves the recovery of valuable equipment from the vessel for reuse and the recycling of parts either for other manufacturing works or in building and repairing other vessels (Gourdon, 2019).

2.2. Methods of Ship Recycling

Ship recycling methods are classified into either standard or substandard categories (Choi et al., 2016). Standard methods possess the capacity to comply with international standards and local regulations that have coverage over reducing the risk of environmental degradation from ship recycling activities and also ensuring the safety of workers at SRFs (Choi et al., 2016). Substandard category methods are however considered as being incapable of meeting international standards and local regulations (Choi et al., 2016). Four ship recycling methods are used globally. These are;

- Drydocking,
- Alongside,

- Landing,
- Beaching.

Drydocking Method: Drydocking is a standard method (Choi et al., 2016) that involves sailing a ship meant to be recycled to a dock, at which point water is pumped out from it, allowing workers to dismantle the ship (Gourdon, 2019). After the demolition, the dock is cleaned and flooded again with water to make way for the entry of other ships scheduled for recycling (Gourdon, 2019). The facility often has a gate that can be locked, a floor structure that is impermeable, a crane, other automated and mechanised tools and equipment that is required by an established ship recycling facility plan (SRFP) (Hougee, 2013).

This method, due to it being undertaken in an enclosed space where there is full containment, reduces the risk of environmental pollution even if there is a spill, making it the most environmentally safe and sustainable method of ship recycling (Hougee, 2013). Drydocking however often occurs at a slow pace thus resulting in a lower annual capacity for ship recycling globally (Choi et al., 2016). It is considered the most costly method since the facility is expensive to build and maintain (Gourdon, 2019).

Alongside Method: Alongside method, pier breaking, quayside or floating method (Gourdon, 2019) is a standard method (Choi et al., 2016) that involves securing the ship to be recycled along a wharf, quay or jetty in rivers or harbours where waters are often calm and thereafter removing the parts from the ships according to plan and in a structured way to a substantial degree through methods like ballasting, lifting and cutting using cranes and heavy cutting equipment (Hougee, 2013). After these activities, the remaining part of the ship, often an empty floating hull also known as the canoe, is sent to a dry dock for final dismantling (Gourdon, 2019).

Landing Method: The landing or slipway method is a standard method (Choi et al., 2016) that involves the sailing of the ship against a concrete slipway that extends out

into the sea or against a shore (Gourdon, 2019). The ship after its stepwise landing, is gradually pulled upwards to the concrete slipway as it is made lighter over a period by the dismantling process (Hougee, 2013). The ship is disassembled using mobile cranes fixed on barges or onshore, with quays or jetties being fixed temporarily at the site to support the use of cutting and heavy lifting equipment (Gourdon, 2019).

The landing method is usually undertaken in areas with very low tide (Gourdon, 2019) since this provides ideal working conditions, allowing the efficient use of cranes and other equipment, granting workers better access to the hull of the ship (Hougee, 2013). This also ensures that operations are carried out in a safe and environmentally conducive manner since the concrete slipway allows for the easy containment and cleaning up of accidental spills (Choi et al., 2016).

Beaching Method: The beaching method historically, one of the most common forms of ship recycling, is a substandard method (Choi et al., 2016) undertaken by sailing or grounding a ship that has been made lighter onto a tidal beach or mudflats where workers can commence the disassembling of the vessel (Gourdon, 2019). During high tide, these ships are run ashore, leaving them grounded by the time the tide gets low and thus granting workers access to cut pieces from the ship in the intertidal zone (Hougee, 2013). The ship by virtue of the disassembling activities undertaken on it becomes lighter and in addition to machines and large steel pieces from it, is subsequently drawn closer to the land through the use of chains and heavy steel wires fixed to huge winches on the beach, at which point it is cut into pieces and transported to factories that process the recovered steel (Hougee, 2013).

2.3. The Global Ship Recycling Industry

2.3.1. Major Ship Recycling Countries

Prior to the 1960s, industrialized countries like the United Kingdom, United States, Italy and Germany were the major players in the SRI, mainly because it was considered then to be an extremely mechanized activity (Hossain 2009). In the early 1980s

however, Asian countries like Bangladesh, India, Pakistan and China undertook the majority of ship recycling operations primarily due to their lower cost of labour and limited safety and health standards, all of which presented opportunities for the minimizing of costs and the maximization of profits (Hossain 2009).

This shift was triggered by the need for developed countries to phase out an industry that at that time was having compliance challenges with international environmental protection standards (Hossain & Rahman, 2011). Out of these Asian countries however, Bangladesh, India and Pakistan are known more especially to use the beaching method (Gourdon, 2019).

Statistics from 2017 show that Bangladesh, China, India and Pakistan together made up 91% of the world's ship demolition volumes (Gourdon, 2019). These countries have a strong demand for the steel acquired from ship recycling operations (Du et al., 2018). Their steel industries with re-rolling mills that make products needed in construction works, from materials such as steel plates acquired from recycled ships is considered as a good alternative that provides economic value (Mikelis, 2018). This reduces the outflow of foreign exchange that would have gone into the importation of steel, thus fostering economic growth (Hossain & Rahman, 2011).

Thriving second-hand markets such as those that exist at Alang in India, Chittagong in Bangladesh and Gadani in Pakistan, serve as a sustainable outlet for ship recycling by the provision of additional income gained from selling machinery, equipment, furniture and other parts from ships (Mikelis, 2018).

Low labour costs have also played a huge role in influencing global demolition volumes in these Asian countries (Gourdon, 2019). Especially in Bangladesh, India and Pakistan (Mikelis, 2018) where there is less development compared to China, the low labour cost and limited or ineffective labour and environmental standards has resulted in very low ship recycling operating costs and business growth (Rossi, 2010).

In Bangladesh alone, an estimated 36,000 people work in the SRI (Rizvi & Adekola, 2020).

In 2020, about 90% of gross tonnage (GT) dismantled across the world was undertaken in three main beaches located in South Asia (NGO Shipbreaking Platform [SBP], 2021). The vessels recycled in these areas comprised 446 big tankers, bulk carriers, cargo and passenger ships and floating platforms (SBP, 2021). As depicted in Figure 2 below, in 2020, Bangladesh recycled 144 ships amounting to 6,946.774GT, India 203 ships amounting to 4,515.973GT, Pakistan 99 ships amounting to 2,256.705GT, Turkey 94 ships amounting to 1,624.568GT, China 20 ships amounting to 216.010GT, the rest of the world 38 ships amounting to 160.841GT and finally 32 ships amounting to 127.843GT was recycled in the European Union (EU) (SBP, 2021).

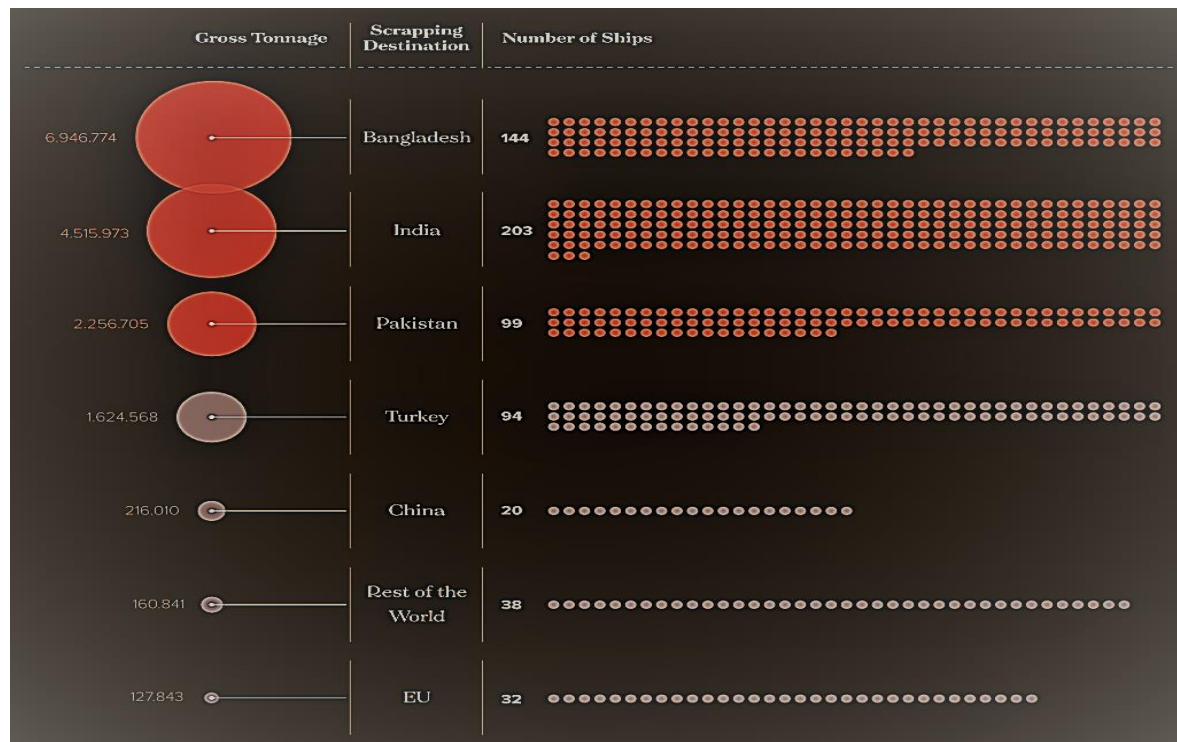


Figure 2: Shipbreaking records 2020 (SBP, 2021)

Global ship recycled tonnage has been on the decline in the past decade and this has mainly been attributed to changes in freight rates and the price of steel (United Nations Conference on Trade and Development [UNCTAD], 2020). In 2016, it fell to 29,135GT, 23,138GT in 2017, 19,003GT in 2018 and 12,218GT in 2019 (UNCTAD, 2020). Turkey however experienced growth in the industry in 2019 with a ship recycling tonnage of 1,095GT as shown in Table 1 below (UNCTAD, 2020) and a further increase to 1,624.568GT in 2020 (SBP, 2021).

The low tide difference in Turkey (Aliaga) makes it ideal for the landing method (Hougee, 2013), although this causes some environmental challenges especially with the increased risk of paint chips and slag falling into the water (NGO Shipbreaking Platform [SBP], 2017). The growth Turkey experienced has however been attributed to the country's ratification of the HKC, which has aided in facilitating its efforts to bring its facilities up to international standards and also the EU's certification of some shipyards in Turkey, thus ensuring their addition to the EU list (EUL) of approved facilities for the recycling of ships (UNCTAD, 2020). The EUL is a list of SRFs that meet the requirements of the EUSRR and have been approved to recycle EU flagged vessels (MARPROF Environmental Ltd [MARPROF], 2020). It therefore comprises various SRFs where vessels regulated by the EUSRR have to be recycled, meaning they cannot be recycled in SRFs outside the EUL (MARPROF, 2020).

Vessel type	Bangladesh	China	India	Pakistan	Turkey	Rest of world	World total	Percentage
Bulk carriers	3 426	238	582	132	161	32	4 570	37.4
Chemical tankers	64	4	125	7	3	9	211	1.7
Container ships	1 015	24	964	12	10	86	2 111	17.3
Ferries and passenger ships	71	2	46	27	76	5	226	1.8
General cargo ships	140	62	150	12	174	36	575	4.7
Liquefied gas carriers	169		70		30	9	279	2.3
Offshore vessels	326	4	543	9	435	197	1 514	12.4
Oil tankers	1 271	14	387	56	119	153	1 999	16.4
Other	200	35	384	13	87	12	732	6.0
Total	6 682	383	6 682	267	1 095	540	12 218	100.0
Percentage	54.7	3.1	26.6	2.2	9.0	4.4	100.0	

Table 1: Shipbreaking records 2019 (UNCTAD, 2020)

The impact of Covid-19 pandemic in 2019 led to many countries like Bangladesh, India and Pakistan initiating lockdowns and port closures to help curb the spread of the disease and this caused many labour shortages in the maritime sector resulting in delays and lower volumes in shipbuilding and global ship recycling tonnage (UNCTAD, 2020). This however began to change with the easing of restrictions and continuation of business (UNCTAD, 2020).

Projections are that the SRI will eventually experience growth due to plans to scrap vessels 15 years and older that are not fuel-efficient and are more costly to operate due to fuel price changes (UNCTAD, 2020). Scrapping will also grow by the eventual phasing out of existing vessels lacking the Ship Energy Efficiency Management Plan (SEEMP) for all ships above 400 GT and also newer ships without the mandatory Energy Efficiency Design Index (EEDI) which requires 30% and higher improvement in a ship's design performance based on the ship type and size, both measures of which have been developed to help the shipping industry meet IMO's initial greenhouse gas (GHG) strategy which seeks to ensure a 50% drop in ship emissions by 2050 as compared to 2008 (Det Norske Veritas, n.d.).

In view of the Covid-19 situation, China by March 2020 had gained 50% of its 2019 output average (UNCTAD, 2020). Its major ship recycling areas are along the Yangtze River in Shanghai, the Pearl River in Xinhui and Dalian in the northern part of China (Kundu, 2020). The country initially banned the beaching method primarily due to pollution related issues and by January 2019, it had closed its market to the recycling of foreign flagged ships (Kundu, 2020). This made the country lose most of its ship recycling market to Bangladesh and India (NGO Shipbreaking Platform [SBP], n.d.). In view of this, the Government introduced a subsidy scheme to foster growth in the industry by building and recycling Chinese flagged and owned vessels (SBP, 2017). However, the expiration of the subsidy and relatively lower steel prices slowed ship recycling activities in the country, making many of the country's ship recycling yards redundant (SBP, 2017).

Although China is known for green ship recycling, there are a number of ship recycling yards in China that are still not well equipped, with many workers in the SRI also lacking adequate training and skills to efficiently handle and dispose of hazardous waste such as asbestos which is still commonly used in the country (SBP, 2017). Many companies in the country have however invested in modern SRFs that use the alongside and drydocking methods with the capacity to recycle large vessels in adequate proportions and by this gain acceptance in the EUL and thus foster growth in the industry (SBP, 2017). It is however, speculated that Beijing (China) may soon rescind its ban decision (SBP, n.d.).

Over the years, the maritime industry has seen a growth in vessel sizes and this has had an impact on operations of various ship recycling industries (Gourdon, 2019). Some European countries have expressed an interest in the development of SRFs for recycling large ships, the capacity to ensure best practices in the industry and the benefits it will bring such as job opportunities and further economic growth (Mikelis, 2018). This however is challenging since Europe is the world's largest net exporter of

scrap steel with majority of its exports moving to other major ship recycling countries like Turkey, China, India and Pakistan which also produce scrap (Mikelis, 2018). The increase of Europe's scrap production would create unneeded competition for its already ferrous scrap industry, leading to surplus or excesses in supply (Mikelis, 2018).

2.3.2. Prospective and Upcoming Ship Recycling Countries

Other countries besides the major ship recycling nations also engage in ship recycling especially since it is often quite uneconomic for a damaged, obsolete or small ship to sail many miles to get to the facilities of the major players to be recycled (Mikelis, 2018). Some of these countries also have a demand for ferrous scrap and a steel processing economy, with others having no such need and in this regard, ship recycling activities there may be a means for disposing of end-of-life vessels (Mikelis, 2018). In South Africa's West Coast for example, the modern 34South SRF a project being developed and supported by the country's Industrial Development Corporation (IDC) will attract a market for end-of-life vessels moving through the Cape of Good hope and the Suez Canal and ensure their recycling undertaken under environmentally sound management (ESM) (Agyare-Dwomoh, 2020).

The history and trend of the SRI clearly shows a continuous race-to-the-bottom pattern with shipowners looking for opportunities to gain amidst the ever-increasing safety and environmental rules and standards (The Ecologist, 2010). The tide is gradually shifting to Africa, with ships sold for ship recycling ending up in countries like Nigeria and Ghana (Rizvi & Adekola, 2020). The current economic and social status of some of the major ship recycling countries has shown that developing countries with a demand for scrap steel imports for its steel making industry and low labour costs will potentially become major SRIs in the future (Mikelis, 2018). The benefits the SRI currently provides and prospects it will bring to these countries is positive, with opportunities for jobs and income for many unemployed people, livelihood for many families and raw materials for existing steel industries (Rizvi & Adekola, 2020).

2.3.3. Factors Driving the Ship Recycling Industry

End-of-Life of Ships: End-of-life ships are a trigger for ship recycling since maintaining their operations including the undertaking of inevitable constant repair works on them is often uneconomic and unprofitable (Mikelis, 2018). Here, shipowners make the economic decision to recycle their ships, when the value to be attained by selling the ship for recovery of its steel is much higher than the revenue generated by the ship during its operations (Hougee, 2013). The SRI continues to grow, with more ships being manufactured worldwide and existing ships eventually reaching their end-of-life (Choi et al., 2016).

Better Environmental Management: Ship recycling is considered a key driver of sustainable development (Du et al., 2018) and an environmentally friendly solution for dealing with obsolete vessels since about 95% of a vessel's materials and equipment can be reused or recycled (Pham, 2019). Ferrous scrap acquired from demolished vessels for example, use electric arc furnaces, which, per ton of steel produced, emits lower levels of CO₂ as compared to blast furnaces and energy-intensive activities and processes needed to extract iron-ore (Gourdon, 2019). Ship recycling is also a better alternative as compared with sinking or abandonment (Rizvi & Adekola, 2020) which poses indirect risks to the ecosystem, since these ships may retain some hazardous materials (Samiotis et al., 2013).

Although new ships based on modern eco-designs, continue to replace old and less efficient ships, the number of existing ships that are not built on such designs means there would still be many global carbon-dioxide emissions from ship operations especially in consideration of IMO's reduction targets for GHG emissions (UNCTAD, 2020). However, energy efficient designs, increased ship size and ship recycling of less efficient ships has proved an ideal alternative to control GHG emissions (UNCTAD, 2020).

Low Demand for Ships: The low demand for ships compared with their supply triggers the need for ship recycling as the ship's high operational and maintenance cost coupled with low profit being generated may be uneconomical (Mikelis, 2018). Periods of global economic or financial crises lead to a decline in international trade, which affects freight rates (Jain et al., 2013), causes a reduction in the number of vessels constructed and an increase in the number of ships sold off and sent to SRFs to be demolished (Samiotis et al., 2013).

A global economic boost however increases trade which triggers an increase in maritime transport, competitive prices for the acquisition of second-hand vessels, a decline in the number of vessels sold out to be recycled for scrap and thus an increase in the price for purchasing ships to be recycled (Samiotis et al., 2013). Due to increased hopes for a better market in 2017, ship recycling quantities in GT that year was about a quarter lower as compared to 2016 (United Nations Conference on Trade and Development [UNCTAD], 2018).

Economic Benefits: According to the EC, about 1,000 ships are recycled globally every single year (Jefferies, 2018) in order to acquire useful materials like aluminium, copper and steel (Det Norske Veritas - Germanischer Lloyd [DNV-GL], 2015). This makes available, potentially recyclable materials amounting to about 20 million tons (Choi et al., 2016).

It is estimated that 80 to 90% of a vessel's light displacement tonnage (LDT) or the weight of a vessel without the materials it carries (Dinsmore, 2011) is made up of reusable materials such as steel and equipment (Argüello, 2016). These prices quantified in USD as per LDT has a strong correlation with the price of steel and thus has a positive bearing on the ship recycling market (Gourdon, 2019).

The valuable steel and materials acquired from recycled ships can make up an estimated 10% or more of the value for building new ships, although the value of such

materials varies due to market prices in the recycling market (Mikelis, 2018). Steel mills and other industries that engage in the re-manufacturing of steel plates, the re-manufacturing of asbestos, oil regeneration and lubricating benefit get a lot of their supply of raw materials from the SRI (Hossain & Rahman, 2011).

The raw materials acquired from ship recycling have also been used in the making of some office and home tools as well as the building of electronic equipment (Gourdon, 2019). In summary, ship recycling provides easy access to steel and increased supply to steel industries, supply of machinery and equipment for sale in second-hand markets, opportunities for businesses that provide supporting services for ship recycling activities and serves as a major provider of jobs and a source of income (The Center for International Environment Law [CIEL], 2011).

Enabling Policies and Regulations: Certain policies and regulations from Maritime Administrations also have the capacity to foster growth in the industry especially if these regulations provide an enabling environment. An example is how the rising cost of ship recycling in developed countries, mainly driven by very strict environmental regulations, which require the internalization of costs, pushed the development of major SRIs in developing countries, which were known to possess an enabling environment for the externalization of costs (CIEL, 2011).

2.3.4. Environmental Impact of the Ship Recycling Industry

In the maritime industry, ship recycling is considered as one of the least environmentally sound activities regardless of the various improvement interventions (Fang & Mejia, 2012). The issues that emanate from ship recycling borders a lot on institutional challenges and design issues (Rizvi & Adekola, 2020). Over the years, occurrences of deaths, injuries, work-related illness and exploitation of migrants among others have been reported to occur on the beaches of major ship recycling countries and specifically in areas such as Gadani in Pakistan, Alang in India and

Chattogram in Bangladesh (SBP, 2021). Also on the 12 of July, 2021 in Aliaga (Turkey), two workers died from a fire outbreak while undertaking ship breaking operations onboard a cruise ship (SBP, 2021).

The ship recycling process involves the cutting of iron using oxygen thus releasing smoke and dust into the atmosphere and metal pieces into the marine environment. The liquid waste washed from the ship and the demolition areas leaks contaminants into the ground with some entering the marine environment and the accumulation of substantial levels of iron filings, rust and wood for example, forms solid waste, which also finds its way into the marine environment causing pollution (Samiotis et al., 2013).

Some SRFs due to their lack of conducive waste reception, containment and treatment facilities pose a hazard with the high tendency for pollution from asbestos, oil, sludge and paints released demolitions and inevitably resulting in grave effects on the health and safety of workers in this industry (Fang & Mejia, 2012). The industry has even been considered as one of the major sources of transfer of hazardous waste from developed countries to developing countries (CIEL, 2011).

According to the NGO Shipbreaking Platform, the sub-standard method of beaching commonly used in developing countries has various setbacks that pose a threat for the environment and the lives of workers at such sites (Hougee, 2013).

Environmental Degradation: There are challenges with pollution containment on beaches where beaching ship recycling activities are undertaken, since there is the increased chance of heavy metals, oils and persistent organic pollutants penetrating the beach sand and contaminating the surface and groundwater, specifically upon the cutting of the ship hull (Hougee, 2013). Chief among these hazardous materials is asbestos which has been prohibited in some countries (Samiotis et al., 2013).

Very often, the spills and hazardous materials resulting from the recycling process of the beaching method are left on the mudflats for the tide upon its subsequent rise to wash away (Choi et al., 2016). Hazardous waste especially those that cannot be sold like bilge water and chemical residue and debris from the recycled ship are dumped around somewhere, burnt at the beaching site or released directly into the marine environment (Hougee, 2013). All these impacts affect fisheries, birds and the marine environment in general (Hougee, 2013).

Work-related Issues: Since labour supply is high especially in areas where the beaching method is used, ship recycling processes there are often undertaken quickly (Choi et al., 2016). However, the labour cost involved is very low with very limited safety measures in place to cater for workers and in addition, there is also inadequate enforcement of existing regulations to ensure better safety measures and fair treatment of these workers (Choi et al., 2016). In some SRFs, workers lack personal protection equipment (PPE) including gloves, masks, helmets and safety boots (DNV-GL, 2015).

The release of harmful pollutants has been known to cause work-related illnesses in workers and sickness to inhabitants in surrounding areas (Jefferies, 2018). In 2000, soil samples in Alang showed the presence of deadly asbestos fibres in the ship recycling yard and the living quarters of workers, thus exposing them to the risk of diseases like lung cancer and asbestosis (CIEL, 2011). Estimates also show that within a 30-year period, about 1200 workers died in ship recycling yards in Chittagong alone (Choi et al., 2016).

There is often poor access for immediate emergency response and support such as ambulances, fire-fighting equipment, vehicles and cranes to help evacuate workers injured alongside the ship or in the hull due to the shifting and soft tidal surface of such beaching areas (Hougee, 2013). The nature of the sand in beaching areas makes it a challenge to install cranes alongside ship hulls that would otherwise have eased the lifting of heavy portions of the ship that have been cut, the lack thereof increasing

the tendency for such heavy pieces to fall directly into the water and also on the workers below (Hougee, 2013). The simple infrastructure on beaching sites which primarily consists of an office building, a wall for boundary demarcation purposes and winches is not adequately safe, thus resulting in many occurrences of accidents during ship recycling activities (Hougee, 2013).

2.4. The Ship Recycling Industry in Ghana

In Ghana, the SRI serves as a supply source to the steel product manufacturing industry. In specific coastal areas such as Prampram in the Greater Accra Region where the beaches are predominantly sandy with spits and barrier lagoons (Alves, 2020) and more especially in secluded parts of these beaches, ship recycling is undertaken by the private sector. The proximity of Prampram to Tema (Darko et al., 2021), the country's biggest industrial area, where some of the country's steel industries and one of Ghana's two major ports are situated, serves as the basis for cost efficient transportation of scrap from the recycling sites to a ready market.

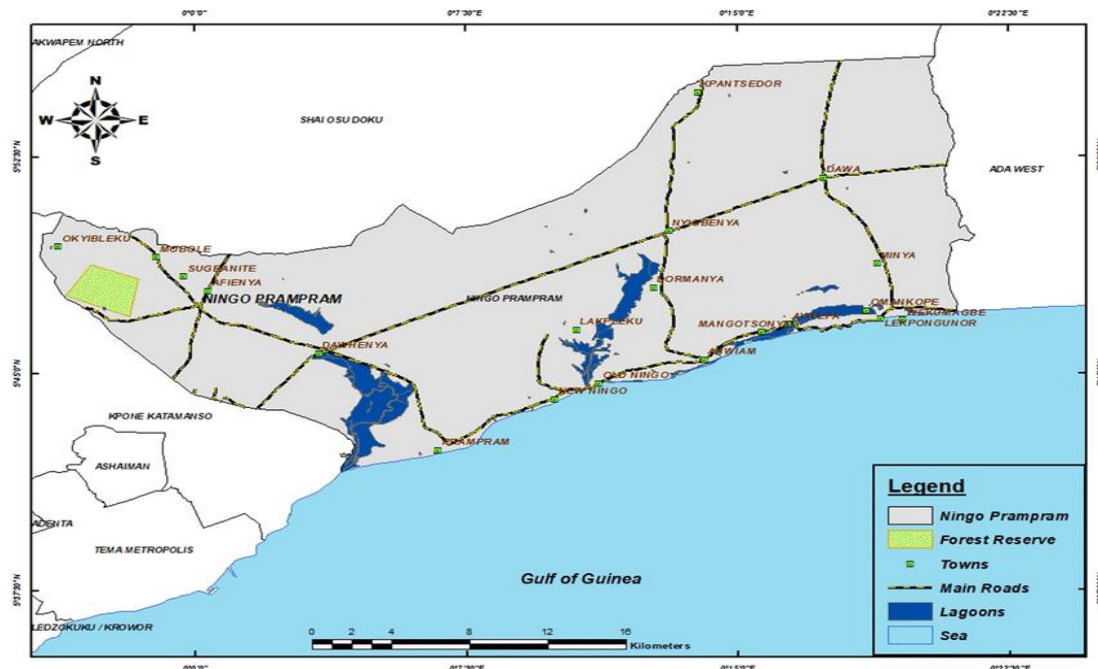


Figure 3: Map of Prampram in Ghana (Darko et al., 2021).

Most ships recycled in Ghana are old foreign vessels of various types and sizes, some of which have been removed from the IMO List and that shipowners have shipped from other countries to Ghana for recycling due to lower charges and costs of doing so. As at December 2020, the country's vessel fleet of 229 vessels and 68,546.582 (GT) had only 19 vessels that were 500 GT and above and were commercially operating on the seas (Ghana Maritime Authority [GMA], 2021). These comprise 15 fishing vessels, 1 fish carrier, 1 tanker, 1 supply vessel and 1 cargo vessel (GMA, 2021). The other 210 vessels in the fleet were either below 500 GT or operated solely in Ghana's inland waters (GMA, 2021) and as such not covered by the HKC as per its Article 3.3.

Statistics for 2019 show that 7 vessels were scrapped or recycled in Ghana, while 11 vessels were recycled in 2020 and 5 were recorded to have been recycled as at July 2021 (Ghana Maritime Authority [GMA], n.d.). Although these figures are quite low as compared to major ship recycling countries, this is an improvement from 2016 when only two vessels were recycled (Mikelis, 2018).

2.4.1. Benefits of the Ship Recycling Industry in Ghana

Better Environmental Management: Ship recycling serves as the best environmentally safe and sound means of dealing with end-of-life ships in Ghana as compared with abandonment on beaches which generally has major environmental and economic impacts.

Economic Benefits: Ship recycling serves as a means of revenue generation and thus economic growth for the country through company taxes and fees paid for ship recycling permits issued by GMA and environmental permits issued by Environmental Protection Agency (EPA).

The industry itself provides business, income and employment for companies and many people and also through the supply of local industries with scrap acquired from

recycled ships that is used for manufacturing and construction purposes either for sale in the local market or exportation.

Ghana is experiencing a boom in industrial and residential construction and this presents more opportunities for producers of steel used for building materials such as iron rods (Oxford Business Group, n.d.). The International Finance Corporation (IFC) planned contributing to the industry's growth by the provision of a US\$ 12 million loan facility to Rider Iron and Steel Ghana Limited for the construction of a steel manufacturing plant in Kumasi, one of Ghana's biggest trading towns (International Finance Corporation [IFC], 2020). This will add 240,000 metric tons to the country's 1 million metric tons existing installed production capacity and by this meet the local demand and export requirements, bringing growth to the industry that currently engages an estimated 4,500 indirect workers and 17,000 indirect workers (IFC, 2020).

Metal smelting and processing is one of the biggest contributors to Ghana's formal industrial economy and scrap metal recycling from all industrial products is one of the informal sector's most abundant industries (Dowling et al, 2016). The Government by enacting a ban on the exportation of ferrous scrap metal which is essential in local steel production, led to the improvement of local scrap supply conditions (World Trade Organization [WTO], 2014). This issue emanated from shortage of supply to the local industry because of increased exportation to other West African countries and Asia where dealers benefited from higher prices (Oxford Business Group, n.d.). In 2019, Ghana's exports of lead through waste and scrap alone was a total of \$10,059.04K, amounting to 7,485,590Kg (World Integrated Trade Solution [WITS], 2019).

2.4.2. Environmental Impact of the Ship Recycling Industry in Ghana

Ghana primarily uses the beaching method and as a result, existing challenges in regulating the industry has a major impact on the areas beaching activities are undertaken and the country as a whole. In addition with other countries, Ghana has

recorded epidemics of metal poisoning from its informal industry in the past (Dowling et al., 2016). Ship recycling activities undertaken in an improper and unsafe manner has had a negative impact on the environment and people, resulting in injuries, illness and death (PrimeNewsGhana, 2019).

According to residents from Kpoe Ete in Prampram, tourism and leisure has been impacted since swimming in areas where ship recycling is undertaken has become a hazard, with some inhabitants being injured from the residue of demolished vessels in the water (PrimeNewsGhana, 2019). The hazardous substances in these ships upon exposure damages the soil and marine environment and as a result, marine resources have been said to be on a decline in such areas thereby affecting the livelihood and food supply of fisherfolk of communities where ship recycling activities are undertaken (Hilmi, 2019).



Figure 4: Scrapped ship in Prampram, Ghana (GMA, 2021)

3. Chapter 3 LEGAL FRAMEWORK FOR SHIP RECYCLING INTERNATIONALLY AND IN GHANA

3.1. The International Legal Framework for Ship Recycling

In the international policy arena, policy makers face challenges with addressing the impact of ship recycling and thus must keep arriving at solutions that meet the expectations of workers in the industry and the environment (Hougee, 2013). This is because of factors such as globalization, the transboundary nature of the industry, the high number of stakeholders and the price driven nature of the shipping industry (Hougee, 2013). The development of a specialized regime comprising various instruments of soft law from the interplay between various international organizations has broadened the scope of the ship recycling regime (Argüello, 2016).

3.2. The Basel Convention on the Control of Transboundary Movements of Wastes and their Disposal, 1989

3.2.1. Overview

The BC was established under the UNEP upon its adoption in March 1989 and entry into force in May 1992 (Hougee, 2013). It has been ratified by about 186 countries globally (Mikelis, 2018). The BC covers the control of transboundary movement (TBM) and disposal of hazardous waste materials such as waste oils and asbestos which may be part of the structure, cargo, supply or stores of mainly end-of-life ships (Gourdon, 2019). It lays out stringent measures to ensure the ESM of waste as stated in Article 2.8 of the BC, which covers the control, the generation of hazardous or harmful waste substances, its exportation and management in order to protect the environment, well-being and health of people, especially workers engaged in ship recycling (CIEL, 2011).

The BC seeks to achieve the following objectives:

- To reduce the generation of hazardous waste and facilitating its ESM and disposal;
- To restrict TBM of hazardous waste with the exception of countries, or facilities considered to have systems capable of ensuring their ESM; and

- To establish a regulatory framework in situations where the TBM of hazardous materials is allowed (Hougee, 2013).

3.2.2. Structure

Parties to the BC are only allowed to engage in the TBM of hazardous waste and other waste if any of the following conditions are met:

- The exporting State lacks the needed facilities or technical capacity, or proper disposal sites required to dispose of the hazardous waste or other waste in an environmentally sound way;
- The wastes serve as raw materials for the recycling or steel recovery industries in the importing State;
- The TBM of hazardous waste and other waste conforms with the criteria of Parties to the BC as stipulated in the decisions adopted by the Conference of the Parties (COP) (Secretariat of the Basel Convention [SBC], n.d).

The guidelines of the BC cover:

- The establishment of best practices under the various ship dismantling methods;
- The identification of hazardous materials and the prevention of their exposure and improper disposal;
- Contingency plans in situations where there is the exposure of these hazardous materials or pollutants; and
- The authorization, monitoring and inspection of ship dismantling facilities (Argüello, 2016).

The BC comprises a detailed Prior Informed Consent (PIC) procedure that has stringent requirements covering the TBM of hazardous waste and other wastes. The PIC is established on four stages, which are:

- **Notification:** This ensures that the exporter informs the importer properly about the proposed TBM of hazardous wastes or other wastes;
- **Consent and issuance of movement document:** This ensures that the importer confirms agreement to the proposed TBM and in addition ensures that the right documents accompanies the shipment;
- **Transboundary movement:** This prescribes the various processes that must be observed upon initiation of the TBM until the point where it is received by the importer or party responsible for the disposal. This is covered by a movement document which gives essential information on each consignment including the waste type, packaging, custom officers it has to go through and details on authorizations from Competent Authorities (CA) pertaining to the proposed movement of the hazardous waste and other wastes.
- **Confirmation of disposal:** This ensures that the waste generator and the exporting country receive confirmation of the disposal of the transboundary hazardous waste and other waste in a planned and environmentally sound form. This also requires that the CA of the exporting country, notify the CA of the importing country upon nonreceipt of this confirmation (SBC, n.d.).

The exporting State is mandated to stop or prevent the transport of the ship carrying the waste if it is considered that it will not undergo ESM or if any of the above conditions have not been met (CIEL, 2011). As a complement to the above, the BC provides procedures and rules for compensation of damages in case incidents occur in the course of transportation (Samiotis et al., 2013).

It was stated in the BC-10/174 decision of the COP 10 of the BC in October 2010, that parties continue to implement the BC in the manner it applies to ships (Mikelis, 2018). The decision also stated the dual stance of parties either in support or against the notion that the HKC possessed and provided an equivalent amount of control and enforcement similar to that of the BC and in addition encouraged parties to ratify the HKC to facilitate its early entry into force (Mikelis, 2018).

3.2.3. Ratification by Ghana

Ghana provided its accession to the BC on 30th May 2003 and it was entered into force on 28th August 2003 (Basel Convention, n.d.). Although it has not been made directly a part of the country's local law, it has somewhat been implemented by the Environmental Protection Agency Act, 1994 (Act 490), which has coverage over the control and management of hazardous waste substances (Amoyaw-Osei et al., 2011).

3.3. The Hong Kong Convention for the Safe and Environmentally Sound Recycling of Ships, 2009

3.3.1. Overview

The HKC was adopted into 2009 by the IMO but it has not yet been entered into force (Jorgensen, 2021). The main objectives of the HKC as stipulated in its Article 1.1 is the protection of the environment and human health from negative impact resulting from ship recycling operations (Engels, 2013). Whereas the BC applies to only one aspect of a ship's life cycle or its final stage where the ship becomes waste with applicability to all waste that fall under TBM, the HKC on the other hand presents a more comprehensive regime that covers the design, construction, operation and recycling of ships in a form of "cradle-to-grave" approach (Engels, 2013).

The HKC after numerous discussions and drafting sessions was adopted by the IMO in May 2009 at a diplomatic conference that took place in Hong Kong, China (Gourdon, 2019). This was fuelled by the IMO's decision at the 7th meeting of the Conference of the Parties to the Basel Convention in 2004, to further its work at developing mandatory standards to facilitate the ESM of ship recycling (Gourdon, 2019).

The HKC in accordance with the provisions stated in Article 17 of the same Convention will enter into force 24 months after the date on which;

- “1. not less than 15 States have either signed it without reservation as to ratification, acceptance or approval, or have deposited the requisite instrument of ratification, acceptance, approval or accession in accordance with Article 16;
- 2. the combined merchant fleets of the States mentioned in paragraph 1.1 constitute not less than 40 per cent of the gross tonnage of the world’s merchant shipping; and
- 3. the combined maximum annual ship recycling volume of the States mentioned in paragraph 1.1 during the preceding 10 years constitutes not less than 3 per cent of the gross tonnage of the combined merchant shipping of the same States.” (HKC, 2009).

Seventeen countries comprising Belgium, Congo, Croatia, Denmark, Estonia, France, Germany, Ghana, India, Japan, Malta, Netherlands, Norway, Panama, Serbia, Spain, and Turkey had ratified the HKC as at June 2021 (Nippon Kaiji Kyokai [ClassNK], n.d.). Even with India’s accession and the minimum number of countries being reached with regards to the requirements for the Convention’s entry into force, more recycling volumes and tonnage is required to effect this (IndustriALL, n.d.).

To facilitate the entry into force of the HKC, an additional 2.1 million GT of recycling capacity is needed (Mikelis, 2019). This can easily be provided by either Bangladesh with a capacity of 9.9 million GT, China with 8.2 million GT or Pakistan with 5.7 million GT, since besides India and Turkey who are already ratifying States, the rest of the world altogether can only contribute 0.6 million GT (Mikelis, 2019).

Pakistan has been noted to make limited strides towards compliance with the HKC and is unlikely to ratify Convention anytime soon since its SRI has been impacted by cheap importation of billets from Iran, unfavorable taxation and interest rates and the recycling of smaller tonnage as compared to before (Mikelis, 2019). Although China’s notional ship recycling capacity that exists from its ship recycling tonnage prior to its ban on the import of end-of-life ships is enough to trigger the entry into force of the

HKC, the ban may indicate the country's unlikelihood of doing so since it may gradually be moving away from the SRI due to its negative impact (Mikelis, 2019). Thus after a decade or more and unless the ban is removed, China may eventually become less of a major SRI (Mikelis 2019).

Although Bangladesh has indicated it would ratify the HKC by 2023, it is suggested that this may happen sooner since the country is working on bringing some of its other yards into compliance with international standards and has even been successful at this by transforming one of its leading ship recycling yards into a model industrial facility that was awarded a Statement of Compliance to the HKC by a classification society under the International Association of Classification Societies (IACS) (Mikelis, 2019). In addition, Safe and Environmentally Sound Ship Recycling (SENSREC) a Norway funded and IMO operated project in the country has brought its administration up to speed with the requirements that must be complied with (Shipping and Freight Resource, 2020).

3.3.2. Structure

The HKC comprises 21 articles and 1 annex which contains another 26 regulations with laid down general provisions and specific requirements related to ships, SRFs and reports (Engels, 2013). The annex has an additional 7 appendices with a particular scope of forms and checklists that are meant to ensure compliance with the HKC's provisions (Engels, 2013). HKC is also complemented by additional 7 Guidelines developed under IMO which relate to the implementation of a particular collection of major obligations, allowing states to fully implement all the provisions (Engels, 2013).

The HKC's requirements under its major obligations are divided into three main areas and these are:

- Chapter 2 - Requirements for Ships [Regulation 4 to Regulation 14];
- Chapter 3 - Requirements for SRFs [Regulation 15 to Regulation 23];

- Chapter 4 - Reporting Requirements [Regulation 24 and Regulation 25] (The Hong Kong International Convention for the Safe and Environmentally Sound Recycling of Ships [HKC], 2009).

The Appendices of the HKC are:

- Appendix 1: Controls Of Hazardous Materials;
- Appendix 2: Minimum List Of Items For The Inventory Of Hazardous Materials;
- Appendix 3: Form Of The International Certificate On Inventory Of Hazardous Materials;
- Appendix 4: Form Of The International Ready For Recycling Certificate;
- Appendix 5: Form Of The Authorization Of Ship Recycling Facilities;
- Appendix 6: Form Of Report Of Planned Start Of Ship Recycling;
- Appendix 7: Form Of The Statement Of Completion Of Ship Recycling (HKC, 2009).

The complementary IMO Guidelines are;

- Guidelines for the Development of the Inventory of Hazardous Materials;
- Guidelines for the Survey and Certification under the Hong Kong Convention;
- Guidelines for the Inspection of Ships under the Hong Kong Convention;
- Guidelines for the Authorization of Ship Recycling Facilities;
- Guidelines for the Safe and Environmentally Sound Ship Recycling;
- Guidelines for the Development of the Ship Recycling Plan (International Maritime Organization [IMO], 2021).

Scope of Application: The applicability of the HKC falls under the following scope:

- Article 3.2 of the HKC, stipulates the Convention's applicability to ships flagged under a party to the Convention or operating under its authority, with the exemption of warships, naval auxiliary, and other ships owned or operated by state parties (HKC, 2009);

- Article 3.3 also stipulates that the Convention does not cover ships of less than 500 GT, or ships only operating in inland waters are also not covered (HKC, 2009);
- Finally, Article 3.4 extends the applicability of the Convention to ships of non-contracting States. It states, “With respect to ships entitled to fly the flag of non-Parties to this Convention, Parties shall apply the requirements of this Convention as may be necessary to ensure that no more favourable treatment is given to such ships.” (HKC, 2009).

3.3.3. Ratification by Ghana

In order to enhance the regulatory framework for ship recycling activities in Ghana, the country’s Deputy Minister of Transportation in 2019, presented the HKC to Parliament for consideration (“In the Third Session”, 2019). This move became successful when in 2020, Ghana became a Contracting Party to the HKC as stated in IMO Circular HKSRC.1/Circ.14, paving the way for the development of legislation, policy and standards to enhance its legal powers and administrative framework that is critical in regulating and developing the SRI in Ghana.

3.4. Other Relevant International Guidelines and Regulations on Ship Recycling

3.4.1. The International Labour Organization Guidelines – Safety and Health in Shipbreaking: Guidelines for Asian countries and Turkey (2004)

3.4.1.1. Overview

The ILO is a specialized agency under the United Nations (UN), which was established in 1919 with the aim of promoting and maintaining peace by securing the rights, fairness and justice of workers globally (Mikelis, 2018). In pursuit of best practices suited to address the impact of the hazardous nature of ship recycling activities on workers in the industry, the ILO at its tripartite meeting in Bangkok in 2003, developed the ILOG as a systematic approach to ensure reasonable standards and improve work conditions in SRFs (Samiotis et al., 2013). The Guidelines are not legally binding and are thus not meant to replace national law, but set out as a guide to make ship scrapping

a more formal economic activity by transforming it gradually from its original informal nature (Rossi, 2010).

3.4.1.2. Structure

Part I of the ILOG ensures responsible ship recycling by establishing the boundaries and specifications for a Completed National Framework (Rossi, 2010). Part I covers the sections listed below.

Part I:

- General responsibilities, duties and rights and legal framework;
- Occupational safety and health management;
- Reporting, recording and notification of work-related injuries and diseases, ill health and incidents;
- Occupational health services (Safety and health in shipbreaking: Guidelines for Asian countries and Turkey [ILOG], 2003).

The second part of the ILOG focuses on setting out measures that are essential in improving worker safety and health (Rossi, 2010) by providing guidelines for safe shipbreaking operations (Qayum and Zhu, 2016). Part II covers the sections listed below.

Part II:

- Operational planning;
- General preventive and protective measures;
- Management of hazardous substances;
- Measures against physical hazards;
- Measures against biological hazards;
- Ergonomic and psychosocial hazards;
- Safety requirements for tools, machines and equipment;

- Competence and training;
- Personal protective equipment and protective clothing;
- Contingency and emergency preparedness;
- Special protection;
- Welfare (ILOG, 2003).

The ILOG sets out to achieve its goals by the application of codes of practice and relevant ILO international instruments, the implementation of comprehensive technical projects directed at national and enterprise levels in order to build up national legislation, assist the necessary authorities to enforce OSH standards and improve OSH interaction on a social level (International Labour Organization [ILO], 2003). This is however in tandem with other related international instruments and Conventions such as the BC and those under the IMO (ILO, 2003).

3.4.2. The European Union Ship Recycling Regulation, 2013

3.4.2.1. Overview

In March 2012, the EUSRR or Regulation (EU) No 1257/2013 of the European Parliament and of the Council of 20 November 2013 on ship recycling and amending Regulation (EC) No 1013/2006 and Directive 2009/16/EC, was established with the mandate of reducing the negative impact of ship recycling activities on EU member states by making it a requirement for these States to ensure that the recycling of end-of-life vessels flying their flags is undertaken in safe and environmentally sound SRFs that fall under the EUL (European Commission, 2016). The EUSRR entered into force in 2013 (Jefferies, 2018). Shipowners from European countries control a major part of the world's fleet and to add to this, majority ships that go for recycling are flagged under EU member States (Hougee, 2013). In accordance with this, member States of the EU, nominate their SRFs for inclusion in the EUL, while having the role of ensuring compliance of these facilities (Directorate-General for Environment [DGE], 2019). SRFs outside the EU must however submit their application, undergo an auditing and review process before being accepted in the EUL (DGE, 2019). This

structure of the EUL opens up opportunities for SRFs in countries worldwide to gain entry into the EUL and thus gain ship recycling market from the EU if these facilities are eventually approved and included in the EUL. The EUL is however updated periodically in order to remove non-compliant SRFs and to add new SRFs to the list (DGE, 2019).

3.4.2.2. Structure

The EUSRR has coverage over the management of waste in all stages including instances where ships are classified as waste and in addition it has coverage over the various facilities that manage them, in accordance with EU directive 98/2008 on waste (Samiotis et al., 2013). In line with this, the EUSRR requires stringent standards of health, public safety, environmental protection for transportation of waste and their disposal thus ensuring the safety of workers at these facilities and public health (Samiotis et al., 2013). The EUSRR permits the recycling of ships outside the EU albeit in authorized facilities, however in consideration of ships as waste under the initial Regulation 1013/2006, the TBM of ships outside the EU was restricted by existing case law (Jorgensen, 2021).

The EC in April 2016 issued safety and environmental requirements and standards to be met by SRFs (European Commission, 2016) as per Articles 13, 15 and 16, title III of the EUSRR (Gourdon, 2019). They also served as technical guidelines for ship recycling activities that, if followed, would grant SRFs inclusion in the EUL even if they were based in countries outside the EU (European Commission, 2016). Although the EUSRR is not an international Convention and as such can not enforce its requirements on SRFs located in non-EU countries, these facilities may be added to the EUL when they send an application to the EC stating such intentions in addition with evidence of compliance with the EUSRR requirements and certification from an independent verifier that has inspected the facility (Mikelis, 2018).

These requirements of the EUSRR comprise:

- Additional aspects on the usage of waste management facilities;
- The control of leakages; and
- Hazardous material containment and impermeable floors (Hougee, 2013).

The EC on the 22nd of January 2020 issued the 6th version of the EUL and this listing gave approval for 41 SRFs including 6 SRFs not based in Europe (Ship Recycling Transparency Initiative [SRTI], 2020). These facilities as per the EUSRR are to be audited by third parties approved by the EC (Hougee, 2013). Through this, shipowners are able to make good decisions in relation to which SRF they would want to use with the assurance that their ship will be recycled in an environmentally sound manner (DNV-GL, 2015). The EUSRR also provides some flexibility since shipowners are able to sell the steel from their demolished ship globally even though they are only allowed to recycle their ships in one ship recycling yard in the EUL (DNV-GL, 2015).

The EUSRR also requires EU flagged ships to have an Inventory of Hazardous Materials (IHM) within a 5-year period upon the agreement of the rules of the EU (Hougee, 2013). In line with this it was required that by 31st December, 2020, ships of 500GT and above flagged under EU Member State and all other ships flagged under non-EU countries should carry an IHM upon anchorage in the European Economic Area (EEA) or visiting an EU port (Jorgensen, 2021). As part of the standards for the EUSRR, the installation and use of specific hazardous materials on ships is prohibited or in some cases restricted and in addition, ships are legally obliged to carry onboard an IHM (Gourdon, 2019).

Under the EUSRR, a shipowner is required to give notification to the EU member State, stating intentions to recycle a ship in addition to a detailed schedule of the complete recycling process (European Commission, 2016). In efforts to assist public authorities and shipowners in the development, implementation and monitoring of the IHM, the European Maritime Safety Agency (EMSA) in 2016 gave guidance on best

practices necessary to ensure the IHM is complete and comprehensive before the commencement of a ship demolition operation (Gourdon, 2019).

The EC has encouraged EU Member States and relevant non-EU countries without delay, to adopt and implement rules for ensuring ships flying the flag of EU member states are recycled sustainably (Hougee, 2013). It also encouraged them to undertake the fast ratification of the HKC primarily because the EU requirements to be implemented were similar to those laid down in the HKC, albeit stricter in some aspects (Hougee, 2013). Even in the preamble of the EUSRR it states “This Regulation is aimed at facilitating early ratification of the Hong Kong Convention both within the Union and in third countries by applying proportionate controls to ships and SRFs on the basis of that Convention.” (Mikelis, 2018).

The EUSRR has additional aspects linked to; Health, Safety and Environmental (HSE) requirements, with significant reference to recommendations from ILO that pertain to ship recycling; downstream waste management; mechanisms of control; and finally, IHM under the HKC although this has an additional two substances to the inventory (Gourdon, 2019). Also, contrary to the HKC which does not prohibit the beaching method of ship recycling, under Article 13, Numeral 1(c) of the EUSRR (1257/2013), requirements are laid out for SRFs to operate from “built structures”, and although the EUSRR does not mention any ship recycling method and it is not explicitly stated, this gives some implication that SRFs using the beaching method are prohibited (Argüello Moncayo, G., 2016).

3.5. Relevant National Laws and Regulations on Ship Recycling in Ghana

For over a decade, the Ghana Maritime Authority Act 2002 (Act 630), Ghana Shipping Act 2003 (Act 645) and Ghana Marine Pollution Act 2016 (Act 932) with coverage over the maritime domain have been used by the GMA to some extent to regulate the SRI. In addition, the Environmental Protection Agency Act (Act No. 490 of 1994)

gives the Environmental Protection Agency (EPA) the mandate to manage matters pertaining to general environmental pollution and the disposal of hazardous waste in Ghana (Environmental Protection Agency [EPA], 2016). These laws may not provide a comprehensive framework for ship recycling however, they have been interpreted as having some coverage over the industry and thus have been applied as such.

3.5.1. Ghana Maritime Authority Act, 2002 (Act 630)

The Ghana Maritime Authority Act, 2002 (Act 630) as amended by the Ghana Maritime Authority (Amendment) Act, 2011 (Act 825) 1, is an Act that establishes the GMA an agency under the MOT with the mandate to regulate, coordinate and monitor activities in Ghana's maritime industry, ship recycling included, and thus implement the provisions of enactments on shipping that have been entered into force (Ghana Maritime Authority Act, 2002 [GMA Act 630], 2002). In line with this, Act 630 gives GMA the responsibility to implement the Ghana Shipping Act 2003 (Act 645) among others in collaboration with other relevant State authorities.

3.5.2. Ghana Shipping Act 2003 (Act 645)

The Ghana Shipping Act, 2003 (Act 645) as amended by the Ghana Maritime Security Act, 2004 (Act 675).1 and the Ghana Shipping (Amendment) Act, 2011 (Act 826).2 is an Act that consolidates with amendments the law on regulation of ships and the maritime industry and other related matter (Ghana Shipping Act [GSA Act 645], 2003).

Section 364 of Act 645 with the caption "Breaking up and Removal of Wrecks" states that;

- "(1) Where a person, who is the owner of a vessel or a wrecked, submerged, sunken or stranded vessel or who is the agent or servant of the owner, wishes to break up the vessel prior to its removal from Ghana, the person shall before commencing salvage or breaking up operations, obtain the written permission of a receiver;

- (2) On receipt of an application for permission to break up a vessel, the receiver may before granting the permission (a) stipulate conditions the receiver considers necessary to minimise the risks or effects of any pollution; and (b) require security of a reasonable amount as the receiver considers necessary to ensure the safe and effective removal of the vessel or any portion of it;
- (3) A person who, without the prior written permission of a receiver, does or causes to be done any salvage or breaking up operations of any vessel or any wrecked, submerged, sunken or stranded vessel lying within Ghana commits an offence and is liable on summary conviction to a fine not exceeding 1000 penalty units or to imprisonment for a term not exceeding 3 years or to both.” (GSA Act 645, 2003).

3.5.3. Marine Pollution Act 2016 (Act 932)

Ghana’s Parliament passed the Maritime Pollution Act 2016 (Act 932) into law in 2016 as a means of implementing MARPOL 73/78 (Buabeng, 2021). Ghana made accession to Marpol 73/78 with the exception of Optional Annexes III, IV and V on 3rd June 1991 and its succession was on 3rd September 1991 (International Maritime Organization [IMO], 2020). Subsequently, Ghana deposited its instrument of accession for Optional Annexes III, IV and V on 1st October 2010, which gained succession on 1st January 2011 (IMO, 2020).

Act 932 comprises many of the international Conventions on marine pollution ratified by the country and was established to ensure the prevention, control and regulation of pollution within the country’s maritime domain (International Tanker Owners Pollution Federation Limited [ITOPF], n.d.). When Ghana discovered oil in commercial quantities in 2007 and joined other oil exporting countries, it saw the need to have a Maritime Pollution Act to prevent operational and accidental ship source pollution in the country (Buabeng, 2021).

Some provisions of Act 932 among others used in relation to the SRI are;

- **Part Three:** It has provisions that cover dumping permits, prohibition of dumping of waste, prohibition of incineration at sea and prohibition of export of waste among others;
- **Part Four (Chapter Two):** It covers the “Prevention of Pollution by Oil” and implements MARPOL Annex I provisions in Ghana. This has provisions on surveys of ships, their certification, the control of discharge from ships and the provision of reception facilities for ship waste; and
- **Part Four (Chapter Three):** It implements the provisions of MARPOL Annex II and has the title “Prevention of Pollution by Noxious Liquid Substances in Bulk”. It has provisions for surveys, the categorisation of substances, cargo record book, Noxious Liquid Substance Certificate, Form of International Pollution Prevention Certificate for the Carriage of Noxious Liquid Substances in Bulk, certificate duration and validity, reception facilities for noxious liquid substances, recognised organizations, nominated surveyors and Shipboard marine pollution emergency plan for noxious liquid substances (Marine Pollution Act [MPA Act 932], 2016).

In realistic terms however, MARPOL 73/78 is meant to have coverage over waste from operational ships (Mukherjee & Brownrigg, 2013) and not non-operational ships or ships that have reached their end-of-life and are to be recycled. The same applies to the implemented form of MARPOL 73/78 in Ghana being the Marine Pollution Act 2016 (Act 932) and as such its use in the regulatory framework of ship recycling in Ghana is somewhat flawed.

3.5.4. Environmental Protection Agency Act, 1994 (Act 490)

The Environmental Protection Agency Act, 1994 (Act 490) establishes the EPA and defines its mandate, structure and system of funding (EPA, 2016). It can be considered somewhat as the implementation of the BC entered into force by Ghana on 28th August 2003 (Basel Convention, n.d.). Act 490 has 65 sections and in relation to

activities that fall under the SRI (Environmental Protection Agency Act [EPA Act 490], 1994).

It states in Section 2;

- “The functions of the Agency are, (j) to issue environmental permits and pollution abatement notices for controlling the volume, types, constituents and effects of waste discharges, emissions, deposits or any other source of pollutants and of substances which are hazardous or potentially dangerous to the quality of the environment or a segment of the environment;” (EPA Act 490, 1994).

3.6. Roles and Obligations of Ghana’s Relevant Agencies in Implementing the Regulatory Framework for Ship Recycling

3.6.1. Ghana Maritime Authority

The GMA is the national maritime administrative authority in Ghana operating under the MOT, with the mandate to perform regulatory, administrative, advisory, research and development functions in the country’s maritime domain (Hilmi, 2019). It was established under the Ghana Maritime Authority Act (Act No. 630 of 2002) and has the mandate to coordinate, monitor and regulate the maritime sector and as such ship recycling activities (EPA, 2016).

In collaboration with the relevant agencies and Ministries the GMA performs major functions such as efficiently and effectively executing flag state and port state responsibilities, facilitating the ratification and implementation of international maritime Conventions and identifying and implementing measures to protect the marine environment and prevent marine source pollution, most of which is covered by the Ghana Shipping Act, 2003, (Act 645) (Hilmi, 2019). GMA collaborates with its stakeholders such as the Ghana Navy and Ghana Marine Police, which have the powers to make arrests in situations where maritime regulations are breached as compared to the GMA, which lacks such arresting powers.

3.6.2. Ghana Navy

The Ghana Navy is a branch under Ghana's Armed Forces with the mission to grow and deploy maritime forces with the needed skills and resources in collaboration with other stakeholders in the maritime sector, to ensure the sustainability of Ghana's maritime domain by making it secure, safe and clean (Ghana Navy, n.d.). It implements this by undertaking functions such as ensuring the protection, preservation and management of Ghana's marine environment and resources and safety of life at sea in collaboration with civil authorities such as the GMA and the Ghana Marine Police (Ghana Navy, n.d.).

In line with the country's Defence Policy, the Ghana Navy has traditional roles, which include policing in the form of nation building and coast guard activities (Ghana Navy, n.d.). It has its headquarters in Accra and two operational commands which are the Sekondi based Western Naval Command and the Eastern Naval Command with its headquarters in Tema (Ghana Navy, n.d.), which is in the same region as the Prampram township where majority of Ghana's ship recycling activities are undertaken.

3.6.3. Ghana Marine Police

The Ghana Police Marine Unit or Ghana Marine Police is a specialized unit under the Ghana Police Service that was established in 2007 upon Government's consideration of the need to better secure the country's maritime domain in the wake of its oil discovery in the same year (Tenge, 2014). It has the mandate to collect intelligence and to undertake coordinated patrols geared at addressing the security challenges in the country's maritime domain and by ensuring and enhancing the security and safety of Ghana's territorial waters (Ghana Police Service, n.d.). It has the Eastern Marine Command in Tema and Western Marine Command in Takoradi of Ghana's Greater Accra Region and Western Region respectively (Ghana Police Service, n.d.).

3.6.4. Environmental Protection Agency

EPA established by the Environmental Protection Agency Act, 1994 (Act 490) is an agency under the Ministry of Environment, Science, Technology and Innovation (MESTI) with the mandate to protect and develop Ghana's environment (EPA, 2016). In fulfilling this, it sets out environmental guidelines and standards, enforces environmental legislation, regulates and inspects businesses to ensure compliance with these standards such as under the Environmental Impact Assessment (EIA) procedures and responds to emergencies that are related to environmental incidents (EPA, 2016). In the performance of its duties, EPA issues environmental permits and pollution abatement notices for managing emissions, waste discharge and other pollutants (EPA, 2016).

4. Chapter 4 COMPARATIVE ANALYSIS BETWEEN KEY OBLIGATIONS OF THE HONG KONG CONVENTION AND GHANA'S CURRENT REGULATORY FRAMEWORK

This Chapter lays out key elements of the regulatory framework for ship recycling in Ghana and highlights some key obligations of the HKC. It thereafter seeks to undertake a comparative analysis of both and thus deduce the lapses and challenges in Ghana's regulatory framework that need to be addressed and enhanced in order to ensure the full implementation of the HKC.

4.1. Regulatory Framework for Ship Recycling in Ghana

In Ghana, there is no specific or detailed legislation with coverage over ship recycling activities. Although the HKC has been ratified by Ghana, the law or Draft Legislation (DL) meant to implement the Convention is currently at its initial development stage. Over the years, Ghana through GMA has established a regulatory framework for the SRI with provisions taken from some aspects or obligations of the HKC.

4.1.1. General Procedure

Ship recycling activities in Ghana are to be conducted with permission and supervision from the Government authorities, primarily GMA. The steps below laid out by GMA, depict the process involved to carry out ship recycling activities in Ghana.

Request for a ship recycling permit:

- To gain a permit, a shipowner must submit a letter to GMA, requesting permission to recycle. This must be accompanied by;
- Proof of ownership/proof of purchase/certificate of registry/certificate of deletion or contract of sale;
- SRP including a Risk Mitigation Plan (RMP);
- SRFP; and
- An environmental permit from the EPA.

Prior Inspection of ship and ship recycling yard:

- GMA thereafter conducts surveys and an inspection on the ship, SRF and equipment to be used in the operations. Most often the ship would already have been brought to the SRF at the beach, however if the ship must be towed to the location for recycling, the vessel to tow it, if not Ghanaian registered must also obtain a permit before it commences its operation;
- GMA then reviews and assesses the surveys and inspection report;
- Upon approval of the report and confirmation of compliance with GMA's standards, the shipowner is notified and given an invoice, upon which payment is made for the issuance of the ship recycling permit. This is supported by a Schedule to Ship Recycling Permit and thereafter ship recycling operations can commence. A rejection or objection of the request to recycle is also communicated to the shipowner upon assessment of their submitted documents, surveys and inspections reports. An objection however gives room for the shipowner to ensure compliance and thereafter upon approval, gain the ship recycling permit.

Inspection of ship, SRF and activities:

- GMA supervises ship recycling activities upon commencement, for the number of days stipulated in the SRP. This is to ensure compliance with its standards.

Notification of completion:

- Upon completion of the ship recycling activities, the shipowner and SRF must notify GMA;
- GMA thereafter undertakes a final inspection of the site to ensure the proper disposal of all waste and area cleared of any remaining ship parts.

4.1.2. Guidelines and Requirements

In line with these procedures above are the provisions set out by GMA. Ghana's regulatory framework for ship recycling, although not extensive and very limited in depth, has requirements that touch on various aspects or provisions of the HKC. These main requirements and guidelines are to be fulfilled by the shipowner and SRF in order to undertake any ship recycling operations in Ghana. They are:

- SRP; and
- SRFP

4.1.2.1. Ship Recycling Plan

Under the SRP, there are three main requirements. These are:

- Summary of information on ship and SRF;
- Ship recycling procedure; and
- RMP.

Summary of information on ship and SRF: This document states "The Ship Recycling Plan is developed in accordance with the Hong Kong International Convention for the Safe and Environmentally Sound Recycling of Ships, 2009 (the

Convention)”. This document as attached in Appendix 1 makes provision for the submission of key information under the following sections below:

- Ship Information;
- Ship Recycling Facility Information; and
- Projected Schedule for Ship Recycling.

Ship Recycling Procedure: This provides detailed information on the cleaning and cutting process to be undertaken during the ship recycling operation. Although it varies based on each ship owner’s proposed procedure, the information provided below gives general coverage on what is required in the procedure.

- Cleaning Process:
 - ❖ Removal of chemical substances
 - ❖ Removal of sludge and related oily materials
 - ❖ Removal of electrical cables and wires
 - ❖ Removal of corks
 - ❖ Removal of wooden and related materials
- Cutting Process:
 - ❖ Dismantling and removal of equipment, machines, cabins and poles on the ship. These can be loaded up and transported to the arranged steel company for sale and possible discharge;
 - ❖ Cutting through the deck of the ship, the engine room and the arches. The loading and transporting for sale and discharge will continue here as well;
 - ❖ Cutting of the hull till it is ready to be removed from the sea for final cutting. The loading and transporting for sale and discharge will also be carried out at this stage; and
 - ❖ Complete removal of the remaining part of the hull from the sea for further cutting. In situations where this can't be done at the SRF, the hull will be towed

to a place with the adequate machines where it can be fully removed from the sea, cut and transported to the steel company.

Risk Mitigation Plan: The RMP is provided by the shipowner or SRF and gives a summary of measures to reduce some known risks such as fire hazard and drowning, associated with ship recycling operations. A sample of this document is attached in Appendix 2.

4.1.2.2. Ship Recycling Facility Plan

GMA requires that a SRF submit the SRFP prior to the recycling of any ship in Ghana's jurisdiction. The SRFP is prepared by the board or management of the SRF and may differ slightly from one SRF to another, although it is in accordance with the provisions of the HKC particularly Regulation 18. The SRFP among others aspects, covers the following:

- Policies for ensuring the safety of workers and the protection of the environment and human health;
- Systems to facilitate and ensure the achievement of the company's policy goals and implementation of HKC requirements; and
- Systems for recording ship recycling operations in the SRF, reporting discharges, emissions, incidents, work-related sickness and injuries.

4.1.2.3. Schedule to the Ship Recycling Permit

Upon approval of the SRP and in granting the ship recycling permit, GMA provides this document in attestation of the shipowner or SRFs' compliance with the set standards and requirements. It attests that dismantling/cutting/recycling activities shall be conducted in a safe and environmentally sound manner and in accordance with the SRP submitted by the company responsible for the ship recycling operations that is approved by GMA. A sample of this document as attached in Appendix 3 covers the various aspects below:

- Safe-for-entry;
- Hot Works (Safe-for-hot-work procedures);
- Prevention of falling from heights and accidents caused by falling objects;
- Housekeeping and illumination; and
- Reporting.

4.2. Analysis

Table 2 below is a comparative analysis between some key provisions of the HKC and commensurate provisions including requirements and guidelines as laid out in Ghana's regulatory framework. The analysis thereafter deduces the lapses that exist in Ghana's framework.

GENERAL HKC OBLIGATIONS	KEY HKC OBLIGATIONS	GHANA'S REGULATORY FRAMEWORK	LAPSES IN GHANA'S FRAMEWORK
Chapter 2 [Requirements for Ships]: <ul style="list-style-type: none"> • Regulation 4 [Control of ships' Hazardous Materials] • Regulation 5 [Inventory of Hazardous Materials] • Regulation 6 [Procedure for proposing amendments to Appendices 1 and 2] 	Regulation 4 [Control of ships' Hazardous Materials]: <ul style="list-style-type: none"> • Sets out restrictions for the installation and use of specific hazardous materials on ships under the authority and in the jurisdiction of State parties to the HKC (Engels, 2013). 	Ship Surveys and Inspections: <ul style="list-style-type: none"> • Ghana has no large-scale shipbuilding industry, but through the GMA it surveys its flagged vessels and inspects foreign vessels that visit its ports, shipyards, offshore facilities, etc. 	No Existing Obligation: <ul style="list-style-type: none"> • Besides asbestos being banned in Ghana, there are no specific restrictions on the installation and use of hazardous materials on its flagged ships or generally by ships within its jurisdiction.

<ul style="list-style-type: none"> • Regulation 7 [Technical Groups] • Regulation 8 [General requirements] • Regulation 9 [Ship Recycling Plan] • Regulation 10 [Surveys] • Regulation 11 [Issuance and endorsement of certificates] • Regulation 12 [Issuance or endorsement of a certificate by another Party] • Regulation 13 [Form of the certificates] • Regulation 14 [Duration and validity of the certificates] 	<p>Regulation 5 [Inventory of Hazardous Materials]:</p> <ul style="list-style-type: none"> • Sets out requirements for the establishment of an IHM for materials stipulated in Appendix 1, the installation or use for that which has solely been restricted and in addition, materials specified in Appendix 2 (Engels, 2013). 	<p>Ship Surveys and Inspections:</p> <ul style="list-style-type: none"> • GMA undertakes surveys and inspections of its flagged ships at various stages and also port state inspections of foreign vessels that call at its ports. 	<p>No Existing Obligation:</p> <ul style="list-style-type: none"> • There is no obligation in Ghana's regulatory framework that makes the establishment of the IHM mandatory and thus it is not a requirement GMA specifically checks throughout the operation of its ships, prior to their recycling and also during port state inspections.
	<p>Regulation 9 [Ship Recycling Plan]:</p> <ul style="list-style-type: none"> • This is established with the objective of facilitating and combining activities carried out by the SRF and the shipowner as an authorized 	<p>Ship Recycling Plan:</p> <ul style="list-style-type: none"> • Ghana's SRP covers many of the various requirements of Regulation 9 in the HKC. It covers this through the following requirements; <ul style="list-style-type: none"> ➤ Summary of information on ship and SRF, ➤ Ship recycling procedure and ➤ RMP. 	<p>Lapses with Proper Standardization:</p> <ul style="list-style-type: none"> • Besides the Summary of information on ship and SRF, which is standardized, the ship recycling procedure and RMP lacks proper standardization since their

	and structured means of providing access to information from the shipowner to the SRF (Engels, 2013).	<ul style="list-style-type: none"> Ship recycling procedure and RMP provide information on the management of hazardous materials involved and the establishment, maintenance and monitoring of working conditions for safe-for-entry. 	development is at the discretion of the SRF and not particularly based on any specific guidelines provided by GMA.
	<p>Regulation 10 [Surveys]:</p> <ul style="list-style-type: none"> Prior to a ship being put into use, surveys related to ensuring compliance with Regulation 5 must be conducted and subsequently renewed after a specific period (HKC, 2009). This final survey is conducted prior to a ship being recycled and would involve the inspection of the IHM, the contents of the SRP and 	<p>Surveys:</p> <ul style="list-style-type: none"> GMA undertakes initial surveys, renewal surveys at periodic intervals, general or partial additional surveys at the request of the shipowner and final survey prior to the recycling of its flagged ships. As part of GMA's final survey, the SRP and the general authenticity of the SRFP are also checked. GMA also issues a Schedule to Ship Recycling Permit upon approval of the final survey. 	<p>No Existing Obligation:</p> <ul style="list-style-type: none"> There are no mandatory obligations for GMA to inspect the IHM. GMA also does not issue an IRRC in a proper standardized form such as is laid out in the HKC.

	<p>the general authenticity of the SRFs authorization (HKC, 2009).</p> <ul style="list-style-type: none"> • International Ready for Recycling Certificate (IRRC) must be issued by the administration, flag state of the ship or authority the ship operates under, upon its approval of the final survey (HKC, 2009). 		
<p>Chapter 3 [Requirements for Ship Recycling Facilities]:</p> <ul style="list-style-type: none"> • Regulation 15 [Controls on Ship Recycling Facilities] • Regulation 16 [Authorization of Ship Recycling Facilities] • Regulation 17 [General requirements] • Regulation 18 [Ship 	<p>Regulation 17 [General requirements] & Regulation 18 [Ship Recycling Facility Plan]:</p> <ul style="list-style-type: none"> • Sets out the requirements for the SRFP gives a detailed depiction of the manner in which SRFs should be managed in future to ensure compliance 	<p>Ship Recycling Facility Plan:</p> <ul style="list-style-type: none"> • GMA requires a SRFP to be submitted by the SRF prior to the recycling of any ship in Ghana's jurisdiction. The SRFP has provisions similar to those of Regulation 18 of the HKC. 	<p>Lapses with Proper Standardization:</p> <ul style="list-style-type: none"> • Although the SRFP is required by GMA, it lacks proper standardization since its development is left to the discretion of the SRF and is not particularly based on any specific guidelines

<p>Recycling Facility Plan]</p> <ul style="list-style-type: none"> • Regulation 19 [Prevention of adverse effects to human health and the environment] • Regulation 20 [Safe and environmental sound management of Hazardous Materials] • Regulation 21 [Emergency preparedness and response] • Regulation 22 [Worker safety and training] • Regulation 23 [Reporting on incidents, accidents, occupational diseases and chronic effects] 	<p>with the HKC's major objectives (Engels, 2013).</p>		<p>provided by GMA.</p>
<p>Chapter 4 [Reporting Requirements]:</p> <ul style="list-style-type: none"> • Regulation 24 [Initial notification and reporting requirements] • Regulation 25 [Reporting upon completion] 	<p>Regulation 24 [Initial notification and reporting requirements] & Regulation 25 [Reporting upon completion]:</p> <ul style="list-style-type: none"> • These facilitate the management of the 	<p>Request for a ship recycling permit:</p> <ul style="list-style-type: none"> • The shipowner is to submit a letter to GMA about intentions to recycle a ship. <p>Summary of information on ship and ship recycling facility:</p> <ul style="list-style-type: none"> • This falls under the request for ship 	<p>Lapses with Proper Standardization:</p> <ul style="list-style-type: none"> • In Ghana, the "Statement of Completion" provided by the SRF is developed at the discretion of the SRF and is not

	<p>complete ship recycling process from the point where the shipowner gives the administration, flag state or relevant authority under which the ship operates, information or the intention to recycle a ship until when the ship recycling procedure is completed (Engels, 2013).</p> <ul style="list-style-type: none"> • The SRF upon completion of the recycling process must issue a “Statement of Completion” which must be reported to the Competent Authority with the mandate to regulate activities of 	<p>recycling permit and covers information on the ship’s name, type, IMO registration number and port of registration.</p> <p>Schedule to Ship Recycling Permit:</p> <ul style="list-style-type: none"> • This prescribes some reporting requirements. • Companies undertaking ship recycling activities are to give a notice to GMA upon commencement and completion of such activities. • GMA must also being notified within 24 hours of any incidents or accidents onboard the ship. 	<p>particularly based on any specific guidelines provided by GMA and more specifically not in accordance with the HKC.</p>
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	<p>the SRFs in the country and thereafter, a copy of the Statement of Completion must be provided to the Administration or flag state of the ship that provided the ship's initial IRRC (HKC, 2009).</p>		
<p>Article 9 [Detection of Violations]:</p>	<p>Article 9.1 [Cooperation by Parties for Detection and Enforcement]:</p> <ul style="list-style-type: none"> Prescribes co-operation of parties in the detection of violations and the enforcement of the provisions of the Convention (HKC, 2009). <p>Article 9.2 [Investigations]:</p> <ul style="list-style-type: none"> Prescribes investigations upon evidence that a ship has 	<p>Detection and Enforcement:</p> <ul style="list-style-type: none"> GMA in collaboration with its stakeholders such as the Ghana Navy and Marine Police cooperate in the detection and enforcement of Ghana's regulatory regime for ship recycling. <p>Investigations:</p> <ul style="list-style-type: none"> GMA undertakes investigations of ships upon evidence that it has operated, are in operation are about to operate in violation of the provisions of Ghana's regulatory regime for ship recycling. 	<p>NIL</p>

	<p>operated, is operating or about to operate in violation of the provisions of the Convention (HKC, 2009).</p> <p>Article 9.3 [Enforcement]:</p> <ul style="list-style-type: none"> • Prescribes enforcement provisions that include warning, detaining, dismissing, or excluding ships in violations of the provisions of the Convention from its ports (HKC, 2009). <p>Article 9.4 [Investigations for Ship Recycling Facilities]:</p> <ul style="list-style-type: none"> • Prescribes investigations by a Party upon substantial evidence that a SRF is operating, has operated or is 	<p>Enforcement:</p> <ul style="list-style-type: none"> • GMA gives warnings, detains, dismisses and excludes ships in violations of the provisions of Ghana's regulatory framework for ship recycling from its ports. <p>Investigations for Ship Recycling Facilities:</p> <ul style="list-style-type: none"> • GMA undertakes the investigation of SRFs under Ghana's jurisdiction prior and during ship recycling operations and also upon substantial evidence that a SRF is operating, has operated or is about to operate in violation of any provision of the Convention. 	
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	<p>about to operate in violation of any provision of the Convention (HKC, 2009).</p> <ul style="list-style-type: none"> • The investigation report shall be given to the Party requesting it and this will include information on the action taken or to be taken, if any, and then to the Organization for appropriate action (HKC, 2009). 		
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Table 2: Comparison Between Key Obligations of the HKC and Ghana's Ship Recycling Regulatory Framework

4.3. Challenges Preventing the Full Implementation of HKC Obligations in Ghana

4.3.1. Lack of a Specific and Comprehensive Law for Ship Recycling

Critical Provisions: Ghana does not have a specific and comprehensive law that fully implements the HKC. Although the country's regulatory framework covers various aspects of the Convention, it lacks some of its critical and pronounced provisions. Details of this are depicted in Table 2 above.

Standardization: The analysis also shows that a few of the guidelines and requirements under Ghana's regulatory framework are not properly standardized to the level prescribed by the HKC. Table 2 above provides more details on these existing lapses.

The absence of some critical HKC obligations in Ghana's regulatory framework and lapses with proper standardization of some of its guidelines and requirements, gives room for:

- Possible delays in the approval or objection to requests made by shipowners for ship recycling permits. Unless these parties are familiar with the administrative processes in Ghana's SRI, many errors may be made during their application for a ship recycling permit, leading to delays and possible objections by GMA. This may discourage potential investors, lead to slow growth in the industry and possibly illegal ship recycling operations by shipowners and SRFs that are frustrated by the processes and hard pressed to make their profits quickly.
- The increased likelihood of registering, flagging and allowing the operating and recycling of ships built with or containing various types of hazardous waste, thus increasing the risks of environmental pollution, work related illnesses and other negative impacts.
- Operational challenges in surveys and inspections of ships and their hazardous materials they possess throughout their life and also SRFs and ship recycling operations since there are no standardized guidelines to follow to ensure the IHM is checked and more so according to international standards.

4.3.2. Limited Capacity and Resources

The lack of resources, limited skills and small number of technical personnel in GMA's Surveys Department (SD), Environment and Safety Standards Department (ESSD) and Monitoring and Enforcement (M&E) Unit has made it challenging to conduct comprehensive surveys and inspections of ship recycling activities and SRFs

according to international standards or more specifically as prescribed by the HKC. There is a general lack of training programmes or workshops in this subject area for capacity building in the country and the lack of awareness about job opportunities in this field has stifled general interest and growth of personnel.

4.3.3. Lack of Proper Ship Recycling Facilities

Ghana lacks a proper SRF such as a dockyard, wharf or slipway and this lapse affirms that SRFs, which are sometimes set up and operated, by the ship buyer or new shipowner are built prior to the recycling of any ship and they are often shut down immediately after the recycling process is completed. These SRFs may also constantly change location for each ship to be recycled depending on the circumstances, such as where the ship is grounded or towed. This has allowed the beaching method to thrive in the country and thus the lack of proper regulation will heavily affect the environment and workers. Although the HKC does not prohibit the use of the beaching method, the temporal nature of the country's SRFs and also simple building structures and equipment that usually make up most beaching SRFs or breaking yards limits the intended applicability of the HKC provisions pertaining to SRFs within Ghana.

5. Chapter 5 CONCLUSION

5.1. Conclusion

The main objective of this paper was to provide a comprehensive overview of the current regulatory framework for ship recycling in Ghana and thereafter upon a comparative legal analysis with key obligations of the HKC, deduce the lapses in Ghana's framework, the challenges resulting in these lapses and recommendation to address these challenges in order to bring Ghana's regulatory framework in compliance and up to par with international standards.

From the research, the conclusion can be drawn based on Ghana's current regulatory regime for ship recycling that the country is on course to fully complying with the

obligations of the HKC, which it has already ratified albeit with some critical developments. Ghana's ratification of the HKC in 2020 and it being the only other African country to ratify the Convention after Congo is a strong indication of the country's resolve and willingness to ensure the development of a better regulatory framework and to transform its SRI.

Ghana has a lot of benefits and opportunities to gain from the SRI if among other solutions, it can develop and enhance its current regulatory framework for ship recycling by the adoption and full implementation of the HKC. This will involve the adoption of some obligations of the HKC that the current regulation is currently lacking and the proper standardization of its guidelines and requirements in compliance with those laid out by the HKC. Other recommendations to facilitate Ghana's full compliance with the HKC are; capacity building and proper resourcing of GMA's personnel responsible for implementing regulations governing the SRI, effective collaboration between GMA and its stakeholders in regulating the SRI and finally the development of proper SRFs.

5.2. Recommendations to Address the Challenges to the Full Implementation of HKC Obligations in Ghana

5.2.1. Domestic Adoption of the HKC and its Full Implementation

The passing of a law to fully implement the HKC by Ghana's Parliament would set international standards and best practices for ship recycling activities in the country and would grant GMA and its stakeholders the full capabilities to effectively facilitate and ensure its ESM. The adoption of the HKC will ensure the full inclusion and implementation of HKC obligations and thus ensure compliance with proper standardized provisions comprising requirements and guidelines laid out by the Convention in the country's regulatory framework for ship recycling.

This will include provisions not limited to but including:

- **Regulation 5:** That would make mandatory the carrying on-board and inspection of the IHM on-board Ghana's flagged ships and all other ships that enter Ghana's

maritime jurisdiction to check issues of hazardous waste especially on end-of-life ships and their impact.

- **Regulation 9 & Regulation 17:** That among benefits will ensure proper standardization of the guidelines for the development of the SRP and the SRFP respectively.
- **Regulation 10:** That among other benefits will ensure the issuance and proper standardization of the IRRC upon satisfaction by the CA that the SRF and ship are compliant with the set out guidelines and requirements that meet international standards.
- **Regulation 24 and Regulation 25:** That among other benefits will seek to ensure the proper standardization of guidelines for the development and issuance of the Statement of Completion upon completion of ship recycling operations.

This step will help to develop a more comprehensive ship recycling regime for Ghana. It will improve the process for the issuance of ship recycling permits and ensure better regulation of ship recycling operations from commencement to completion.

5.2.2. Capacity Building and Resourcing

In order to fully implement and enforce the HKC upon its adoption, the GMA or its SD, ESSD and M&E Unit to be specific, must be equipped with more personnel, skills and resources in order to fully implement the provisions of the HKC. The following are possible recommendations to enhance the efficiency and effectiveness of the GMA and others in ensuring this;

- **Capacity Building:** Capacity building in technical and other aspects of the HKC would be ideal in ensuring GMA's personnel are more informed and equipped. Training programmes and workshops on ship recycling and international standards as prescribed by the HKC and other relevant international guidelines and regulations would be ideal in giving the personnel under GMA, the relevant

knowledge, skills and tools to function efficiently by fully implementing the provisions of the HKC.

- **Resourcing:** Due to the dangerous nature of ship recycling, personnel of GMA and its stakeholders must also be well equipped with PPE, communication devices and an upgrade of its Vessel Traffic Management Information System (VTMIS) which it uses in some cases in conjunction with its stakeholders like the Ghana Navy and Marine Police to monitor ship recycling activities in certain areas along Ghana's coastline. The VTMIS must be upgraded since the satellite imagery it currently provides does not give detailed information to fully ascertain ship recycling activities thus requiring actual field confirmation to affirm the nature of what was provided by the VTMIS.

5.2.3. Collaboration with EPA

In the current regulatory framework, GMA does not fluently collaborate with the EPA in regulating the SRI although it factors in the submission of EPA permits and certificates by the shipowner and SRF in its requirement for ship recycling permits. EPA has mandates that cover environmental pollution and disposal of hazardous waste and issues permits in that regard for ship recycling operations. It is stated in Section 12 on Environmental Impact Assessment of the Environmental Protection Agency Act, 1994 (Act 490) that;

- “(1) The Agency may, by notice in writing, require a person responsible for an undertaking which in the opinion of the Board has, or is likely to have, adverse effect on the environment to submit within the period specified in the notice an environmental impact assessment.
- (2) Where the Agency issues a notice under subsection (1), it shall inform the organ or the department of government that has responsibility for the issue of a licence, permit, an approval or a consent in connection with a matter affecting the environment that the notice has been issued, and that organ or department shall not

grant the licence, permit, approval or consent unless with the prior approval in writing of the Agency after compliance with the notice.” (EPA Act 490, 1994).

In view of this, certain end-of-life ships and ship recycling activities that pose a threat to the environment can be halted by EPA, concurrently with a notice to GMA which is responsible for providing ship recycling permits in Ghana. Thereafter, collaboratively and upon assessment, compliance can be ensured to endorse the granting of permits, the re-issuance of permits and continuance of the ship recycling operation or a complete halt of it if compliance fails.

In consideration of the mandates of both agencies, the GMA as regulator of the maritime sector would have lead role in regulating the SRI, however effective collaboration would help to reduce the inflow of end of life vessels carrying large amounts of hazardous waste and would also complement the operations of the GMA in ensuring proper management and disposal of hazardous waste and other wastes in ship recycling yards.

5.2.4. Building of Ship Recycling Facilities

The lack of SRFs in Ghana can be attributed to limited focus by the Government and its agencies on the current revenue provided by the SRI and prospects for its growth. The industry has been perceived to be non-vibrant due to the country’s low fleet size and its relatively small number of ship recycling activities in the country over the years.

To develop SRFs such as a drydock for the drydock method or a wharf for the alongside method, the Government should include this initiative in its budget for the maritime sector or the MOT through the Minister of Transport may through a tender approved by Parliament, make the request for the construction of such facilities open for Private Public Partnerships (PPP) in situations where the country may not have the

funds to do so. The country can also facilitate the upgrade of some of its existing shipyards by turning them into top-notch industrial facilities in collaboration with their private owners.

The development or building of proper SRFs will help to ensure:

- Better compliance with the requirements of the new Legislation currently being developed to fully implement the HKC.
- Better management and disposal of waste or hazardous materials and thus reduce environmental pollution and its impact on the environment, marine life and people;
- Safety measures are better implemented to reduce the tendency of work-related accidents, illness and death;
- Potential to meet the EUSRR SRF requirements, and upon inspection and verification, gaining acceptance to the EUL. This will result in more opportunities for the country through the recycling of EU flagged vessels or other flagged vessels that have shipowners who prefer to recycle in EUL SRFs.

References

- Agyare-Dwomoh Y. (2020). A green compliant ship recycling facility in South Africa. *Recycling Magazine*.
<https://www.recycling-magazine.com/2020/10/01/a-green-compliant-ship-recycling-facility-in-south-africa/>
- Alves, B., Angnuureng, D. B., Morand, P., & Almar, R. (2020). A review on coastal erosion and flooding risks and best management practices in west africa: What has been done and should be done. *Journal of Coastal Conservation*, 24, 1-22
<https://doi.org/10.1007/s11852-020-00755-7>
- Amoyaw-Osei Y., Agyekum O. O., Pwamang J. A., Mueller E., Fasko R., Schluep M. (2011). Ghana e-Waste Country Assessment. SBC e-Waste Africa Project
<http://www.basel.int/Portals/4/Basel%20Convention/docs/eWaste/E-wasteAssessmentGhana.pdf>
- Argüello Moncayo, G. (2016). International law on ship recycling and its interface with EU law. *Marine Pollution Bulletin*, 109(1), 301-309.
<https://doi.org/10.1016/j.marpolbul.2016.05.065>
- Basel Convention. (n.d.). Parties to the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal
<http://www.basel.int/?tabid=4499>
- Buabeng A. G. (2021). The Maritime Pollution Act 2016 (Act 932).
<https://thebftonline.com/26/03/2021/the-maritime-pollution-act-2016-act-932/>
- Choi, J. K., Kelley, D., Murphy, S., & Thangamani, D. (2016). Economic and environmental perspectives of end-of-life ship management. *Resources, Conservation and Recycling*, 107, 82-91.
<https://doi.org/10.1016/j.resconrec.2015.12.007>
- Darko, G., Bi, S., Sarfo, I., Amankwah, S. O. Y., Azeez, F. E., Yeboah, E., Oduro, C., Kedjanyi, E. A. G., Archer, B., & Awuah, A. (2021). Impacts of climate hazards on coastal livelihoods in ghana: The case of ningo-prampram in the greater accra region. *Environment, Development and Sustainability*, , 1-30.
<https://doi.org/10.1007/s10668-021-01492-z>

- Det Norske Veritas (n.d.). Decarbonization in shipping.
<https://www.dnv.com/maritime/insights/topics/decarbonization-in-shipping/regulatory-overview.html#>
- Det Norske Veritas - Germanischer Lloyd. (2015). Customer Focus: You Never Sail Alone. Maritime Impact Issue 03-15.
https://epub.sub.uni-hamburg.de/epub/volltexte/2016/57549/pdf/Maritime_impact_2015_3_.pdf
- Dinsmore B. (2011). A Guide to Understanding Ship Weight and Tonnage Measurements. The Maritime Sight.
<https://www.themaritimesite.com/a-guide-to-understanding-ship-weight-and-tonnage-measurements/>
- Directorate-General for Environment. (2019). Safer ship recycling for a greener world. Luxembourg: Publications Office of the European Union.
<https://op.europa.eu/en/publication-detail/-/publication/af91259e-5a0a-11eb-b59f-01aa75ed71a1/language-en>
- Dowling, R., Caravanos, J., Grigsby, P., Rivera, A., Ericson, B., Amoyaw-Osei, Y., Akuffo, B., & Fuller, R. (2016). Estimating the prevalence of toxic waste sites in low-and middle-income countries. *Annals of Global Health*, 82(5), 700-710.
<https://www.sciencedirect.com/science/article/pii/S2214999616307573>
- Du, Z., Zhang, S., Zhou, Q., Yuen, K. F., & Wong, Y. D. (2018). Hazardous materials analysis and disposal procedures during ship recycling. *Resources, Conservation and Recycling*, 131, 158-171.
<https://doi.org/10.1016/j.resconrec.2018.01.006>
- Engels, U. D. (2013). European ship recycling regulation: entry-into-force implications of the Hong Kong Convention (Vol. 24). Springer Science & Business Media.

- Environmental Protection Agency. (2016). Strategic Environmental Assessment (SEA) On Opening up the Onshore Voltaian Basin for Oil And Gas Exploration & Production
http://www.epa.gov.gh/epa/sites/default/files/downloads/publications/SEA_Onshore%20Voltaian%20Basin_%26%20Keta%20Delta%20Blk_Final%20Scoping%20Report.pdf
- European Commission. (2016). Waste Shipment.
<http://ec.europa.eu/environment/waste/shipments/legis.htm>
- Fage, J. D., Maier,. Donna J., Davies,. Oliver and Boateng,. Ernest Amano (2021). *Ghana*. Encyclopedia Britannica.
<https://www.britannica.com/place/Ghana>
- Ghana Maritime Authority. (n.d.). Technical Services Division.
- Ghana Maritime Authority. (2019). 2019 Annual Report.
- Ghana Maritime Authority. (2021). 2020 Annual Report.
- Ghana Maritime Authority Act, 2002 (Act 630) As Amended by Ghana Maritime Authority (Amendment) Act, 2011 (Act 825) 1.
[https://www.bcp.gov.gh/acc/registry/docs/GHANA%20MARITIME%20AUTHORITY%20ACT,%202002%20\(Act%20630\).pdf](https://www.bcp.gov.gh/acc/registry/docs/GHANA%20MARITIME%20AUTHORITY%20ACT,%202002%20(Act%20630).pdf)
- Ghana Navy. (n.d.). About Ghana Navy.
http://bernicelemaire.com/ghananavy/?page_id=77
- Ghana Police Service. (n.d.). Marine Ports & Railways.
<https://police.gov.gh/en/index.php/marine-ports-railways/>
- Ghana Shipping Act, 2003 (Act 645) As Amended By Ghana Maritime Security Act, 2004 (Act 675).1 Ghana Shipping (Amendment) Act, 2011 (Act 826).2.
[https://bcp.gov.gh/acc/registry/docs/GHANA%20SHIPPINT%20ACT,%202003%20\(Act%20645\)%20AS%20AMENDED%20BY%20ACTS%20675%20AND%20826.pdf](https://bcp.gov.gh/acc/registry/docs/GHANA%20SHIPPINT%20ACT,%202003%20(Act%20645)%20AS%20AMENDED%20BY%20ACTS%20675%20AND%20826.pdf)

- Global Initiative for West, Central and Southern Africa. (2010). National Oil Spill Contingency Plan.
<https://www.giwacaf.net/en/countries/ghana>
- Gourdon, K. (2019). Ship recycling: An overview.
<https://doi.org/10.1787/397de00c-en>.
- Hilmi K. (2019). The state of Maritime Safety and Marine Environment Protection in Ghana.
https://www.academia.edu/39926808/The_state_of_Maritime_Safety_and_Marine_Environment_Protection_in_Ghana
- Hossain, M. M. M., & Rahman, M. A. (2011). Ship breaking activities: threats to coastal environment and fish biodiversity. Ecosystem Health and Management of Pollution in the Bay of Bengal, 23.
<https://www.boblme.org/documentRepository/4.%20Ecosystem%20health%20&%20management%20of%20pollution%20in%20the%20BoB.pdf#page=24>
- Hougee, M., (2013). Shades of green in the ship recycling industry: An assessment of corporate end-of-life vessel policies and practices. MSc Thesis, Environmental Policy Group, Department of Social Sciences, Wageningen University.
<http://edepot.wur.nl/261797>
- IndustriALL. (n.d.). India ratifies Hong Kong Convention.
<http://www.industriall-union.org/worlds-largest-shipbreaking-country-ratifies-hong-kong-convention>
- International Finance Corporation. (2020). IFC's \$12 Million Loan for Steel Plant in Ghana to Create Jobs, Support Skills.
<https://pressroom.ifc.org/all/pages/PressDetail.aspx?ID=16155>
- International Labour Organization. (2003). New Guidelines for ship-breaking Adopted.
http://www.ilo.int/global/about-the-ilo/newsroom/news/WCMS_005294/lang--en/index.htm
- International Maritime Organization. (n.d.). Member State.
<https://www.imo.org/en/About/Membership/Pages/MemberStates.aspx>

- International Maritime Organization. (2009). The Hong Kong International Convention for the Safe and Environmentally Sound Recycling of Ships. International Maritime Organization.
<https://www.imo.org/en/OurWork/Environment/Pages/Ship-Recycling.aspx>
- International Maritime Organization. (2020). Status of Imo Treaties.
<https://wwwcdn.imo.org/localresources/en/About/Conventions/StatusOfConventions/Status%20-%202020.pdf>
- International Maritime Organization. (2021). Maritime Facts and Figures: Ship Recycling.
<https://imo.libguides.com/c.php?g=659460&p=4744890>
- International Maritime Organization Circular Letter HKSRC.1/Circ.14.
<http://shippingregs.org/Portals/2/SecuredDoc/Circulars/HKSRC.1-Circ.14.pdf?ver=2019-12-05-114614-650>
- In the Third Session of the Seventh Parliament of the Fourth Republic of Ghana. (2019). Report of the Committee on Roads and Transport on Maritime Protocols and Conventions.
<http://ir.parliament.gh/bitstream/handle/123456789/1306/REPORT%20OF%20COMMITTEE%20ON%20ROADS%20AND%20TRANSPORT%20ON%20MARITIME%20PROTOCOLS%20AND%20CONVENTIONS-MARCH%2c2019.pdf?sequence=1&isAllowed=y>
- International Tanker Owners Pollution Federation Limited. (n.d.). Ghana.
<https://www.itopf.org/knowledge-resources/countries-territories-regions/ghana/?L=>
- Jain, K. P., & Pruyn, J. (2017). An Overview of the Global Ship Recycling Industry. Delft University of Technology.
<https://doi.org/10.1016/B978-0-12-803581-8.10396-0>
- Jefferies, K. (2018). Beaching of vessels for shipbreaking – legal, illegal or somewhere in between?.
<https://www.gard.no/web/updates/content/26050185/beaching-of-vessels-for-shipbreaking-legal-illegal-or-somewhere-in-between>

- Jorgensen, R. N. (2021). Ship Recycling. Baltic and International Maritime Council.
<https://www.bimco.org/about-us-and-our-members/bimco-statements/13-ship-recycling?port=66423d58df324a0fb1ba1a9e94ab0696>
- Kundu A. (2020). China on the Verge of Reversing Ship Recycling Ban. The Maritime Executive.
<https://www.maritime-executive.com/article/china-on-the-verge-of-reversing-ship-recycling-ban>
- MARPROF Environmental Ltd. (2020). Report on the European List of Ship Recycling Facilities.
<https://www.bimco.org/-/media/bimco/ships-ports-and-voyage-planning/environment-protection/recycling/updated-report-on-the-european-list-of-ship-recycling-facilities-december-2020-final.ashx>
- Mikelis, N. (2018). The Recycling of Ships.
https://www.anave.es/images/documentos_noticias/2019/ships_recycling__NM.pdf
- Mikelis N. (2019). Developments in Ship Recycling in 2019. The Maritime Executive.
<https://www.maritime-executive.com/editorials/developments-in-ship-recycling-in-2019>
- Mukherjee, P. K., & Brownrigg, M. (2013). Farthing on international shipping. Heidelberg: Springer.
- NGO Shipbreaking Platform. (n.d.). China.
<https://shipbreakingplatform.org/our-work/the-problem/china/>
- NGO Shipbreaking Platform. (n.d.). What We Do.
<https://shipbreakingplatform.org/our-work/what-we-do/>
- NGO Shipbreaking Platform. (2017). Annual Report
<https://www.shipbreakingplatform.org/wp-content/uploads/2018/07/Annual-Report-2017-Final-Spreads.pdf>

- NGO Shipbreaking Platform. (2021). Press Release – Platform publishes list of ships dismantled worldwide in 2020.
<https://shipbreakingplatform.org/platform-publishes-list-2020/>
- NGO Shipbreaking Platform. (2021). Press Release – Two workers die while scrapping cruise ship in Turkey.
<https://shipbreakingplatform.org/two-workers-die-in-turkey/>
- Nippon Kaiji Kyokai. (n.d.). Ship Recycling Convention (the Hong Kong Convention).
<https://www.classnk.or.jp/hp/en/activities/statutory/shiprecycle/index.html>
- Okafor-Yarwood I., Walker T., & Reva D. (2021). Gulf of Guinea piracy: a symptom, not a cause, of insecurity. Institute for Security Studies.
<https://issafrica.org/iss-today/gulf-of-guinea-piracy-a-symptom-not-a-cause-of-insecurity>
- Oxford Business Group. (n.d.). Strong as steel: The growing metals segment seeks to capitalise on regional markets.
<https://oxfordbusinessgroup.com/analysis/strong-steel-growing-metals-segment-seeks-capitalise-regional-markets>
- Pham, The Quyen. (2019). An assessment of development opportunities of ship recycling facilities based on the shipbuilding yards' infrastructures in Vietnam.
https://commons.wmu.se/all_dissertations/1195
- PrimeNewsGhana. (2019). Abandoned ships in Prampram waters wrecking fishing activities.
<https://www.primenewsghana.com/general-news/abandoned-ships-in-prampram-waters-wrecking-fishing-activities.html>
- Qayum, S., & Zhu, W. (2018). Ship breaking industry of Pakistan and its environmental effect on marine life and humans.
<http://nopr.niscair.res.in/bitstream/123456789/44621/1/IJMS%2047%287%29%201335-1344.pdf>

Rossi, V. (2010). The dismantling of end-of-life ships: the Hong Kong Convention for the safe and environmentally sound recycling of ships. *Ital Yearb Int Law*, 20, 275-298.

https://www.researchgate.net/profile/Valentina-Rossi-22/publication/235248719_The_Dismantling_of_End-of-Life_Ships_the_Hong_Kong_Convention_for_the_Safe_and_Environmentally_Sound_recycling_of_ships/links/5c4af30892851c22a38ee4b9/The-Dismantling-of-End-of-Life-Ships-the-Hong-Kong-Convention-for-the-Safe-and-Environmentally-Sound-recycling-of-ships.pdf

Rizvi J. M. & Adekola O. (2020). How to recycle a huge ship – safely and sustainably. World Economic Forum
<https://www.weforum.org/agenda/2020/09/how-to-recycle-a-huge-ship-safely-and-sustainably/>

Safety and health in shipbreaking: Guidelines for Asian countries and Turkey. (2003).
https://www.ilo.org/wcmsp5/groups/public/---ed_protect/---protrav/---safework/documents/normativeinstrument/wcms_107689.pdf

Samiotis, G., Charalampous, K., & Tselentis, V. S. (2013). Recent developments in the institutional framework of ship recycling and the positive impact on international ship dismantling practices. *SPOUDAI-Journal of Economics and Business*, 63(3-4), 158-171.
<https://spoudai.unipi.gr/index.php/spoudai/article/view/79/168>

Secretariat of the Basel Convention. (n.d). Controlling transboundary movements of hazardous wastes.
<http://www.basel.int/Portals/4/Basel%20Convention/docs/pub/leaflets/leaflet-control-procedures-en.pdf>


Shipping and Freight Resource. (2020). Sound ship recycling project in Bangladesh given the go-ahead.
<https://www.shippingandfreightresource.com/sound-ship-recycling-project-in-bangladesh-given-the-go-ahead/>

Ship Recycling Transparency Initiative. (2020). 2020 Report
<https://www.shiprecyclingtransparency.org/wp-content/uploads/sites/2/2020/07/SRTI-2020-Report-V7.pdf>

- Tenge E. (2014). Who Are The Marine Police?. Daily Guide.
<https://www.modernghana.com/news/560040/who-are-the-marine-police.html>
- The Center for International Environment Law. (2011). Shipbreaking and the Basel Convention: Analysis of the level of control established under the Hong Kong Convention.
https://www.ciel.org/Publications/Shipbreaking_22Apr11.pdf
- The Ecologist. (2010). Shipbreaking: clampdown in Asia will send it to Africa.
<https://theecologist.org/2010/mar/02/shipbreaking-clampdown-asia-will-send-it-africa>
- United Nations Conference on Trade and Development. (2018). Review of maritime transport 2018.
https://unctad.org/system/files/official-document/rmt2018_en.pdf
- United Nations Conference on Trade and Development. (2020). Review of Maritime Transport 2020.
https://unctad.org/system/files/official-document/rmt2020_en.pdf
- World Integrated Trade Solution. (2019). Ghana Lead; waste and scrap exports by country in 2019.
<https://wits.worldbank.org/trade/comtrade/en/country/GHA/year/2019/tradeflow/Exports/partner/ALL/product/780200>
- World Trade Organization. (2014). Trade Policy Review; Ghana.
https://www.wto.org/english/tratop_e/tpr_e/s298_e.pdf

APPENDICES

Appendix 1: Summary of information on ship and SRF



Ship Recycling Plan
Summary of information on ship and Ship Recycling Facility

This ship recycling plan is developed in accordance with the Hong Kong International Convention for the Safe and Environmentally Sound Recycling of Ships, 2009 (the Convention).

Ship Information

Name of ship	
Distinctive number of letters	
Port of registry	
Gross tonnage	
IMO number	
Name and address of shipowner	
IMO-registered owner identification number	
IMO company identification number	
Telephone number	
E-mail address	

Ship recycling facility information

Name of Ship Recycling Facility	
Distinctive Recycling Company Identity No.	
Full address of Ship Recycling Facility	
Primary contact person	
Telephone number	
E-mail address	
Name, address and contact information of ownership company	
Working language(s)	

Projected schedule for ship recycling

Date of ship arrival at Ship Recycling Facility	
Date of commencement of ship recycling	
Date of Completion of ship recycling	
Date of completion of sale/disposal of all components	

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(Signature of Ship Recycling Facility owner/operator)

Appendix 2: Risk Mitigation Plan

Summary of Measures to mitigate some of the commonly known potential risk associated with our recycling process:

Nº	RISK	MITIGATING FACTORS
1	FIRE	FIRE COVER, FIRE EXTINGUISHER, WATER PUMPING MACHINE, FIRE HAZARDS SAFETY ORIENTATION
2	POTENTIAL SPILL	DRAIN OIL AND FUEL FROM VESSEL BEFORE OPERATION
3	SHIP TRIPS AND FALLS	PROPER HOUSE KEEPING AND SAFETY ORIENTATION
4	DROWNING	LIFE JACKETS, LIFEBOUYS AND SAFETY ORIENTATION
5	BODILY INJURY	WEAR APPROPRIATE PPE. HELMETS, OVERALL, SAFETY BOOTS, GOGGLES, HANDGLOVES ETC.

Appendix 3: Schedule to the Ship Recycling Permit



SCHEDULE TO THE SHIP RECYCLING PERMIT

General

The dismantling / cutting / recycling activity shall be conducted in accordance with the Ship Recycling Plan submitted by [REDACTED] and approved by GMA.

The entire process shall be carried out in a safe and environmentally sound manner taking into account the following:

- i. Job hazard awareness, including handling and management of Hazardous Materials and wastes and the methodology and procedures for identifying and segregating materials.
- ii. Use of personal protective equipment;
- iii. Fire protection and prevention;
- iv. Emergency response and evacuation;
- v. Environmental awareness; and
- vi. First-aid treatment of casualties

Safe-for-entry

The company shall comply strictly with safe-for-entry procedures prior to entry and during work in enclosed spaces and other areas where the atmosphere is dangerous.

Ensure that spaces are not entered until a Safe-for-entry verification has been carried out by checking the Oxygen content, Flammable atmospheres, Toxic, corrosive irritant or fumigated atmospheres and residues.

Hot Works

Safe-for-hot-work procedures

Ensure that no hot work commences onboard unless the area is deemed "Safe-for-hot-work" after inspection and testing all of the following:

- i) enclosed spaces and all other spaces enclosed by bulkheads and decks (including tanks, quarters, and machinery and boiler spaces) that potentially contain dangerous atmospheres;
- ii) adjacent to spaces that contain or have contained combustible or flammable liquids or gases;
- iii) spaces adjacent to fuel tanks that contain or have last contained fuel;
- iv) pipelines, heating coils, pump fittings or other accessories connected to spaces that contain or have last contained fuel; and
- v) bilges, engine room spaces and boiler spaces not containing dangerous atmospheres.

Prevention of falling from heights and accidents caused by falling objects

Personal flotation devices, guarding deck openings, deck edges and platforms shall be used including personal fall arrest systems and guard rails and ensuring safe access to the vessel to prevent slip-and-fall accidents and the dropping and scattering of objects.

Housekeeping and illumination

All work areas, such as aisles, passageways and temporary deck openings shall be kept clean and clearly illuminated.

Warning signs and labels shall be displayed in all areas of works

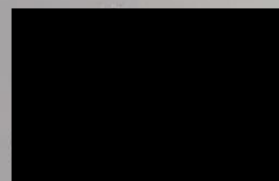
Reporting

The company shall submit a report to the Authority at commencement and completion of the cutting activity.

Notification of any incidents or accidents onboard is to be made within 24hrs of such occurrences to the Authority.

Issued at: Accra

Date: [REDACTED]



DIRECTOR-GENERAL

GHANA MARITIME AUTHORITY
MINISTRIES POST OFFICE
FMB 34, MINISTRIES
ACCRA