



STRATEGIC PLAN TO RATIFY HKC 2009 BY BANGLADESH: CHALLENGES AND APPROACH TOWARDS IMPLEMENT SRFP IN LOCAL YARDS TOWARDS GREEN SHIP RECYCLING

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Abstract: Ship recycling is the activity of dismantling of a ship at a ship recycling facility (SRF) in order to recover components and materials for reprocessing and re-use, including management of hazardous and other materials on site. It is estimated that at present, globally around 20,000 ships over 500 gross tonnages are more than 20 years old and will soon be sent for recycling. For the last twenty years, ship recycling yards in Bangladesh, China, India, Pakistan and Turkey have been recycling 97% of all the recycled tonnage in the world, in which the share of Bangladesh is over 25%. The increase in demand for ship recycling has rightly led to an increase in regulatory pressure at both national and international levels. This regulatory pressure resulted in the development of the Hong Kong International Convention (HKC) for the Safe and Environmentally Sound Recycling of Ships in 2009, to mandate safety and environmental protection standards at yards and ensured Ship Recycling Facility Plan (SRFP), documenting the yard's systems, facilities and processes. The recycling facilities in South Asia mainly use the open beaching method and which may release pollutants into the coastal environment. Suitable and more safer alternatives method like slipway, alongside and dry dock recycling techniques are already being used in China, Turkey and Western facilities, but it incur huge cost. Most recently, the EU Ship Recycling Regulation (EU SRR) was adopted, and according to this regulation, beaching method is not permitted as well as ships under EU flag need to be recycled at European List of ship recycling facilities. All the potential competitors around the globe like China, Turkey and India are already working on upgrading their ship recycling yards to meet the international standards. It is thus evident that necessary measures should be taken to upgrade ship recycling yards in Bangladesh to maintain competitiveness by complying with international regulations. It is a depth study of existing ship recycling facilities in Bangladesh to develop a strategic plan to meet the international standards keeping beaching method intact.

Key words: Beaching, dry-docking, SRFP, SRF, SRP, SBSRB, HKC, PPE, SHE

Introduction

The international shipping industry transports around 90% of global trade. The daily operations of ships can result in the accumulation of hundreds of tons of garbage due to excessive waste disposal. Additionally, the decommissioning of ships at the end of their service adds a huge amount of unwanted waste materials into the

environment, which can potentially have disastrous effects. It is interesting to note that the shipping sector has surpassed the automotive and aviation industries in terms of recycling, with up to 98% of ship materials being reused. The hull of any vessel, whether wooden or steel, has historically been valuable. Ship recycling is the optimal way to discard a vessel, as it is recognized as an efficient method of saving money and resources, as 90% of the scraped materials can be repurposed and recycled. Ship recycling is an ingenious reverse engineering technique that has become increasingly popular for end-of-life ships (EOL).¹ It involves carefully dismantling obsolete vessels to reclaim reusable components, with the aim of protecting the environment and ensuring safety standards are met. Surprisingly, ship breaking could have been converted into an environmentally friendly industry, as nearly every component of the vessel is recycled and reused. Green ship recycling has been implemented around the world as a beneficial alternative to other ship-breaking practices that have a negative impact on the environment. Ship recycling is a costly endeavor, particularly if one attempts to do it perfectly. However, combining existing standard practices, such as the beaching method in South Asia, with green recycling can save a substantial amount of money while still being environmentally friendly.²

Historical texts indicate that industrial ports in the USA and UK were known for their ship-breaking activities until the late 1900s. Ship-breaking and recycling then moved from Europe and North America to East Asia in the 1980s, and eventually to South Asia. The Ship-Breaking Regulatory Initiative (SBRI) shifted to East Asian countries such as Japan, Korea, Taiwan, and China due to their access to cheap labor and lack of strict occupational health and environmental regulations. This has resulted in these countries dominating the ship-breaking space. In 1977, Taiwan had a strong grip on the ship-breaking industry, with more than half of the market share. From 1977 to 1980, the Gadani ship-breaking yard in Pakistan held the record for being the world's largest ship-breaking yard. South Asia is currently the epicenter for ship breaking and recycling initiatives globally, with Bangladesh, India, and Pakistan being the leading contributors.³ Their combined share accounts for 70 to 80 percent, with China and Turkey taking up the majority of the remaining percentage.⁴ A tiny fraction of global ship demolition takes place outside the five main countries. Surprisingly, shipbreaking can be an environmentally friendly industry, as nearly every component of the vessel is recycled and reused. This helps to maintain a balanced use of our natural resources and preserve the environment.

The ship breaking industry in Bangladesh first began in the 1960s when a Greek vessel named the MD Alpine became stranded in Sitakund, Chattogram due to a destructive cyclone. This prompted local businesses like the Chittagong Steel House to purchase the vessel and recycle its parts. The consequence of this was a large expansion in the industry. During Bangladesh's War of Independence in 1971, a bombing resulted in the damage of a Pakistani vessel known as 'Al Abbas'. After being abandoned at sea, the vessel was salvaged and taken to Fauzdarhat seashore. In 1974, Karnafully Metal Works Ltd bought it as scrap, thus kickstarting the commercial ship breaking industry in Bangladesh. This industry really boomed during the 1980s.⁵

The ship-breaking industry has had a major economic impact on Bangladesh for many years and is critical for improving both the macro and micro economies of the country, which is often plagued by poverty. Ship-breaking activities present an interesting predicament for our coastal zone management. We need to find a way to make this practice economically viable while taking into account the associated environmental and labor conditions. Striking a balance between satisfying the need for raw materials, such as steel, and reducing their adverse effects is a necessity. Environmental policies and laws were not enforced, labor salaries were among the

¹ Golam Mohiuddin, Akter Hossain, Tareque Ali, "Evaluation of present ship recycling scenario and opportunity for Bangladesh," Environment and Analytical Toxicology, Volume, Issue, Apr 2023

² Hossain, K. A., 2018d, "Proposed Viable Ship Recycling Process for South East Asian Recycling Yards" Procidia Engineering, 27 Jul, 2018

³ Jain, K. P., Pruyun, J. F. J. and Hopman, J. J., "Material Flow Analysis (MFA) as a Tool to Improve Ship Recycling", Journal of Ocean Engineering, Vol. 130, pp. 674–683, 2017.

⁴ Ahammad, H. and Sujauddin, M., Contributions of Ship Recycling in Bangladesh: An Economic Assessment", IMO-NORAD SENSREC Project, IMO, London, 2017.

⁵ Hossain K A, 2021, Ship recycling Process and Material Distribution Channel Model for Bangladesh Ship-Recycling Industry, Vol 2, Issue 1, BIMRAD Journal, May 2021

lowest in the world, and there were no standards for occupational health and labor safety.⁶ Approximately 150 ship breaking yards are located in Chattogram, of which 50 to 60 are active throughout the year. In the current climate, the Bangladeshi ship breaking industry is creating a turnover of 12,750 crore BDT per annum (in 2022). This industry also provides numerous employment opportunities in poverty-prone regions of Bangladesh.⁷ Ship breaking in Bangladesh is a labor-intensive process that requires minimal tools and machinery such as winches, cranes, bulldozers, and blowtorches. However, it largely relies on manual effort of human workers to get the job done. In Bangladesh, recycled steel satisfies 20% of the country's consumption requirements, while in India it is almost 10%.⁸

In 2009, the International Maritime Organization (IMO) created the Hong Kong International Convention (HKC) for the Safe and Environmentally Sound Recycling of Ships in response to rising regulatory scrutiny. This agreement establishes stringent standards meant to ensure safety and environmental protection at shipyards. An essential part of being HKC-compliant recycling Yards must have Ship Recycling Facility Plan (SRFP). This plan must demonstrate the yard's systems, processes, and facilities that have been put in place to ensure safety and environmental protection. The SRFP outlines should have necessary details of a ship recycling facility, including its layout, water depth, accessibility, maintenance, and dredging requirements. It is an invaluable resource for anyone looking to understand how these facilities work. The growing demand for ship recycling has prompted stricter regulations at local and international level to ensure safety and compliance.

The SRFP provides crucial information regarding a ship recycling facility, including its layout, water depth, accessibility, routine maintenance, dredging, etc. South Asian recycling plants largely employ the open beaching system. While this method has been profitable, it can also release hazardous materials into the coastal region. The European Union Ship Recycling Regulation (EU SRR) was recently adopted, prohibiting the open beaching method and requiring ships under the EU flag to be recycled at certified European ship recycling yards. This regulation has enabled ships to be recycled responsibly as green recycling technique. Competitors from countries like China, Turkey, and India are striving to develop their ship-recycling yards according to global standards. Therefore, steps must be taken to enhance the ship recycling yards in Bangladesh in order to remain competitive and comply with international regulations to survive in this global business. Thorough investigations of local existing ship-recycling facilities are important, and essential. Therefore, it is imperative to conduct some studies in order to identify deficiencies and make improvements of local recycling yards to continue the business in competitive world.

It is a combination of research and analytical work to analyze the present position of global ship recycling regulatory drivers' to implement SRFP in the recycling yards and ratify HKC 2009 specially in Bangladeshi yards and relate the challenges for local recycling industry to survive in the competitive market and move towards green recycling by evaluating on ground data of local ship recycling yards of Bangladesh and available information around the globe. Here effort has been made to collect data and information by authors from both primary and secondary method. Primary data has collected during visits to numerous ship-recycling yards, organizations and agencies related to this industry and stake holders. Secondary information was sourced from a range of articles, research papers, publications and media channels like print, social and electronic outlets.

Statistical Analysis of Ship Dismantled around the World (2012-2022)

In February 2016, the NGO Ship breaking Platform Secretariat in Brussels published a report detailing ship breaking data by country. The statistics show that in one year alone, 768 large ships were destroyed globally, while 469 vessels ran aground on coasts of India, Pakistan & Bangladesh.⁹ In February 2017, Brussels hosted the release of the 2016 data on vessel dismantling records by country, organized by a specific

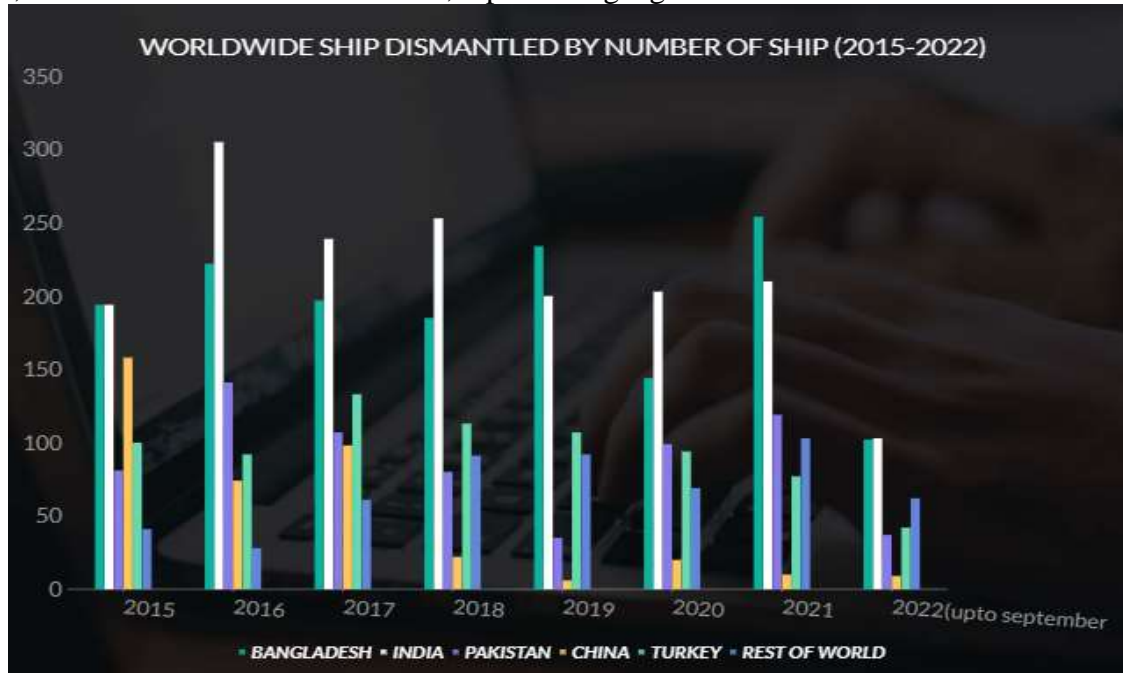
⁶YPSA, 2023, Overview of Ship Breaking in Bangladesh, <https://shipbreaking.info/overview-of-ship-breaking> accessed on Feb 15, 2023.

⁷Business Inspection (YPSA, 2023)n, 2022, Ship Breaking and Recycling Industry of Bangladesh, <https://businessinspection.com.bd/ship-breaking-industry-of-bangladesh> accessed on Feb 21, 2023.

⁸Rekacewicz, Philippe (25 February 2012). "Shipbreaking in Asia | GRID-Arendal – Maps & Graphics library". *www.grida.no*. GRID-Arendal. Archived from the original on 6 September 2015. Retrieved 2 August 2015.

⁹Heidegger, Patrizia, "Press Release – NGO publishes 2015 list of all ships dismantled," NGO Ship breaking Platform, 2015

organization dedicated to this cause. The data revealed that 862 vessels were demolished in one year, representing 87% of the total vessel tonnage dismantled worldwide. This figure includes 668 vessels removed from tidal beaches, indicating the extent of their destruction. In 2017, the Brussels-based NGO Ship breaking Platform reported that 835 big oceangoing vessels were sent to ship breaking yards, with 543 of them being scrapped in Bangladesh, India, and Pakistan. In 2021, the ship recycling sector in Bangladesh saw a sharp increase, from 144 in 2020 to 254 in 2021, representing a growth of almost 56.69%.¹⁰



WORLDWIDE SHIP DISMANTLED BY NUMBER OF SHIP (2015 - 2021)

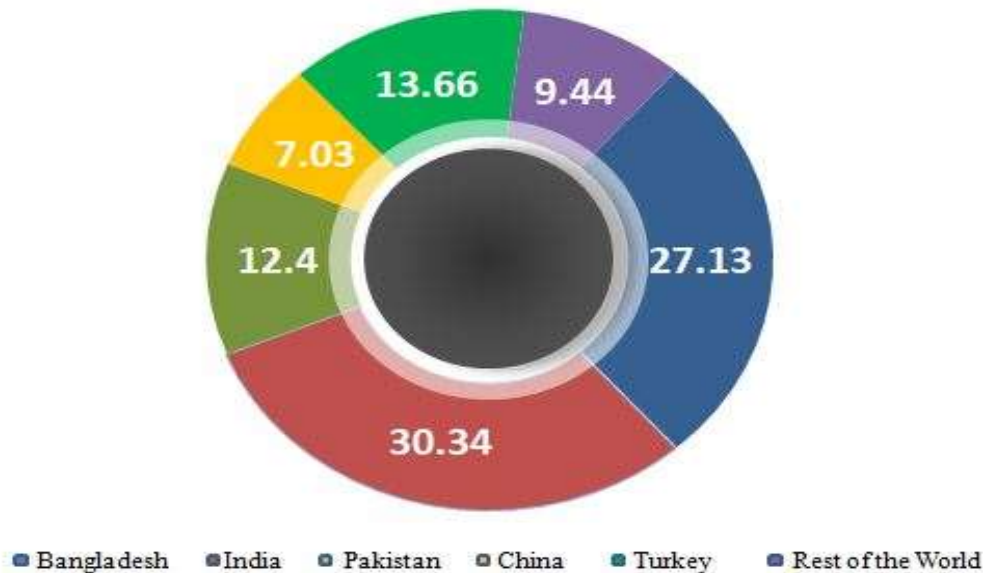


Fig 1: Statistical Analysis of Ship dismantled between years 2015 to 2022¹¹

¹⁰ Golam Mohiuddin, Khandakar Akter Hossain, Shahidul Islam, “Analysis of present global ship recycling status and challenges for Bangladesh,” Global Scientific Journal, Volume, Issue, Apr 2023

¹¹Ship Breaking around the world, <https://shipbreakingbd.info/ship-breaking-around-the-world/>

International and Local Regulatory drivers for Ship Recycling

The nations involved in ship recycling make a significant contribution to their nation's economy, so they are not eager to enact any laws that would regulate the sector. Several global laws have been issued to address sub-par practices across South Asia, which can have a damaging influence on health, security, and the environment. Taking these changes into account will help ensure that these issues are addressed. Given the ineffectiveness of international regulation of ship recycling (Basel Convention) and the non-entry into force of the Hong Kong Convention, the European Union has decided to take action on its own. The European Union has taken steps to regulate ship recycling and is already implementing parts of the Hong Kong Convention. Regulation No. 1257/2013 on Ship Recycling (EU SRR) was effectively enforced in December 2013, yielding tangible results.¹²

In 2009, the International Maritime Organization (IMO) adopted the Hong Kong Convention on Ship Recycling, with the aim of improving safety and environmental protection. Unfortunately, it has still not entered into force after all these years. The European Union's SR No. 1013/2006, which implements the Basel Convention and its Amendment in Europe, forbids the disposal of hazardous waste to non-organization for Economic Co-operation and Development (OECD) countries and prohibits any exports of waste outside the European Union/European Free Trade Association (EFTA) region for disposal. Effective December 31, 2018, the European Union Ship Recycling Regulation (EU SRR) has come into effect. The Regulation requires that ship recycling activities satisfy various environmental and occupational health and safety standards that are more stringent than those outlined in the Hong Kong Convention. All vessels with European Union flags must be recycled in facilities that have been approved and included on the EU's list of authorized locations worldwide. The EU maintains an up-to-date record of these sites for this purpose.



¹²<https://britishmarine.com/news-and-advice/advice-and-notice/european-union-ship-recycling-regulation>, accessed on 14 February 2023

Table 1: Summary of the Ship recycling legislation

Legislation	Aim	Entry into Force & Contracting States	Guidelines
Basel Convention (BC) 1989 (UNEP)	To control of trans boundary movement of hazardous wastes and their disposal	05 May 1992 (186)	Technical Guidelines for ESM of Dismantling of EOL Ships (2002) (186)
Ban Amendment (1994)	To control of trans boundary movement of hazardous wastes and their disposal from NON-OECD to OECD Country	06 Sept 2019	--
WSR 2006 (EU)	To combat issue of unauthorized waste transport & establishes standards of BC in EU		--
HKC 2009 (IMO)	<ul style="list-style-type: none"> • For Safe and Environmentally Sound Recycling of Ships • Specifically designed for ship dismantling 	Not yet (Expected within 2023) (17)	<ul style="list-style-type: none"> • Development of SRP • Safe & Environmentally Sound Ship Recycling • Authorization of SRF • Development of IHM
SRR 2013 (EU)	To quickly adopt and ratify Hong Kong Convention	31 Dec 2018	Vessels visiting EU harbors must have IHM certificate

In 2011, the Ministry of Industry implemented two key regulations to oversee Ship Breaking and Recycling: The Ship Breaking and Recycling Rules 2011 and the Environmental Protection Act 1995. The Ship Breaking Regulatory Authority was then formed to comply with these laws. To protect the environment, the Ministry of Environment and Forest issued the Environmental Protection Rules 1997. These regulations are essential for preventing environmental damage and keeping our planet healthy. The Department of Environment is solely responsible for enforcing the regulations. Before participating in any activities, ship recycling yards must obtain authorization from the DoE to continue their operations. This authorization is known as an Environmental Compliance Certificate (ECC). Yards are doing their best to keep their workers safe and are also becoming aware of the need for environmental conservation. As a result, some have been able to meet international standards for green ship-recycling practices.

Challenges

Ship recycling has been a booming industry for the last few years, with the major actors of the ship recycling nations accounting for more than 98% of the total worldwide recycled tonnage; Bangladesh alone accounts for more than 25% of that. In recent times, various active regulatory drives have imposed stricter rules to address safe and environmentally sound ship recycling around the world. As a result, IMO created the HKC

2009 specifically for ship recycling, though it has not yet come into force. To facilitate quick adoption and ratification of the HKC, the EUSRR was effectively enforced in December 2013 and came into force in December 2018. According to the regulation, all vessels with a European Union flag must be recycled in the EU's list of Ship Recycling Facilities (SRF) or as per the HKC. Thus, the challenges faced by active actors in Bangladesh due to regulatory drives can be summarized as follows:

1. More than 80% of the world's shipping fleets are under EU countries. Therefore, if Bangladesh does not ratify HKC as soon as possible, it will lose control over its market share in ship recycling.
2. India, one of the leading ship recycling nations accounting for approximately 30% of the global share, ratified the Hong Kong Convention on 28 November 2019, and is also heading towards the European Union Ship Recycling Regulation. Nearly 96 of its 120 shipyards have achieved Statements of Compliance (SoC) from various IACS class societies, and around 15 are on the EU list. Whereas, Bangladesh has achieved only three projects up to December 2022 (PHP, KABIR Steel, SN Corporation) and one project on the verge of completion (KR Steel). As a result, there is a strong possibility that Bangladesh's market share will decrease, and India's could double in the next few years. Thus, it will have a detrimental effect on our source of steel raw materials, employment, and national revenue.

Taking into account those issues mentioned above and the pressure from regulatory drivers and active actors, the Bangladesh Government enacted the Bangladesh Ship Recycling Rules-2011 and Bangladesh Ship Recycling Acts 2018 to implement HKC (Regulation 18) by 2023, where SRFP is a must. The owners of SRF should be prompt to achieve the HKC goal. As of today, 85 SRF are in the pipeline to achieve the goal. Below are a few suggestions for Bangladesh to ensure the early implementation of HKC:

- (1) Approximately 40 core taka is required to implement HKC SRFP for a local yard. In this regard, the government may provide a soft loan to the yard owners. Additionally, the mindset of the SRF/yards owners should also be changed.
- (2) Considering the cost of implementing SRFP in SRF, overall expenditure will rise. Therefore, for the sake of environmental, safety, and health issues in this sector, the government may relax or reduce taxes, fees, etc.
- (3) The stakeholders and the Ministry of Industry should come forward to make the accession as convenient as possible, aiming for the early ratification of HKC by 2023.
- (4) A modified, low-cost, improvised SRFP plan can be implemented to encourage the yard owners. Additionally, the SoC by the IACS members should be more convenient, easy to implement, and tailored to the situation. Prompt guidance is required for the SRF to address the SRFP.

Analysis of HKC

The International Maritime Organization (IMO) developed the Hong Kong International Convention (HKC) as the international standard for safely and sustainably recycling commercial ships. This provides assurance of a reliable and secure process. Although HKC hasn't been officially implemented yet, many recycling centers have already started, or are in the process of adapting their operations to meet its standards. They are aiming to achieve Statements of Compliance as a result. Classification societies regularly release statements that are in line with the Convention's principles and guidelines. These institutions have a deep understanding of the Convention and use this knowledge to interpret it accurately. Therefore, just like ISO certificates, different statements can have varied interpretations and the best way to ensure that specific needs and requirements are taken care of is by consulting an expert.

SWOT ANALYSIS OF HKC

STRENGTHS

- Equal worldwide standards for Ship Recycling and provide a level playing field for all stakeholders
- Defines requirements for every vessel being recycled and stipulates to ensure safe and environmentally friendly recycling

WEAKNESSES

- Doesn't prohibit beaching or landing methods for vessels.
- Recycling yards are required to make improvements and will become more expensive. Besides Ships can still be recycled at non-party recycling facilities which undermine the convention.



THREATS

- Strongly criticized by NGOs, UN, European Parliament and UNEP Basel Convention for not providing standards which ensure safe and sound ship recycling
- Relies on flag state jurisdiction and thus prone to circumvention by flag-hopping

OPPORTUNITIES

- HKC is a reaction to the growing concern about safety, health, environment and welfare of ship recycling countries.
- International standard for recycling of commercial vessels developed by the IMO.

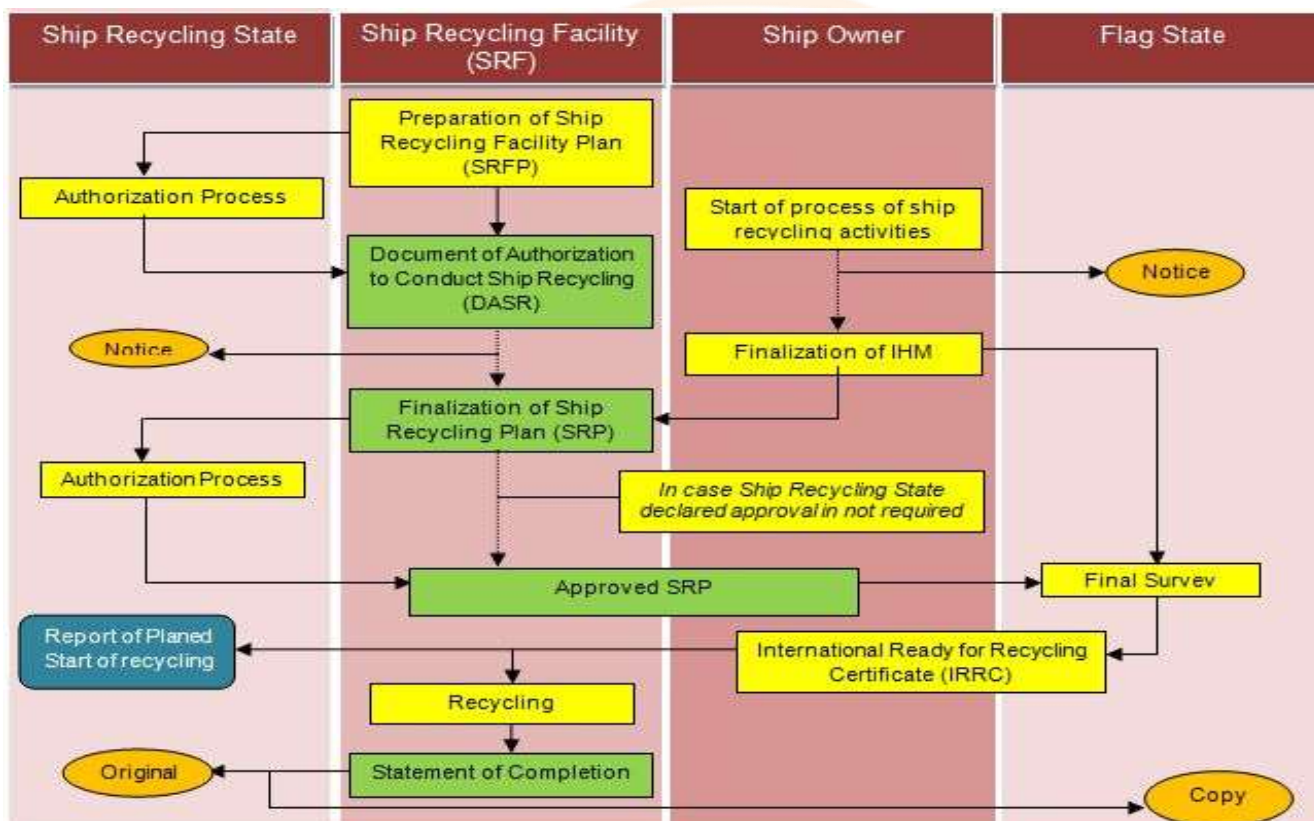
Requirements and conditions for ratifications

What do ship owners need?	The Inventory of Hazardous Materials (IHM) is an international certification issued by the flag state. It covers three distinct parts: Part I (Structure & Equipment), Part II (Operative Wastes), and Part III (Stores). The certification ensures that the material is ready for recycling.
What do Yards need?	Ship Recycling Facility Plan (SRFP) and Ship Recycling Plan for the ships received for recycling (SRP). Document of Authorization to conduct Ship Recycling, as per the DASR.

<p>When will the Convention enter into force?</p>	<p>24 months after:</p> <ul style="list-style-type: none"> • At least fifteen states must agree to the proposed terms for them to be officially ratified. • Ratifying states have a larger share of the world's merchant shipping gross tonnage, with their combined merchant fleets accounting for at least 40% of it. <p>In order to be ratified, ratifying states must have had a combined maximum annual ship recycling volume of at least 3% of their total merchant shipping tonnage in the last 10 years.</p>
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Parameter & Approach of HKC to Ship Recycling



The following guidelines have been developed and adopted to assist States in the early implementation of the Convention's technical standards:

- a) 2011 Guidelines for the Development of the Ship Recycling Plan, adopted by resolution MEPC.196(62);
- b) 2012 Guidelines for Safe and Environmentally Sound Ship Recycling, adopted by resolution MEPC.210(63);
- c) 2012 Guidelines for the Authorization of Ship Recycling Facilities, adopted by resolution MEPC.211(63); and
- d) 2015 Guidelines for the development of the Inventory of the Hazardous Materials, adopted by resolution MEPC.269(68).

Additional two guidelines have been developed and adopted to assist States in the implementation of the Convention after it enters into force:

- e) 2012 Guidelines for the survey and certification of ships under the Hong Kong Convention, adopted by resolution MEPC.222 (64); and
- f) 2012 Guidelines for the inspection of ships under the Hong Kong Convention, adopted by resolution MEPC.223(64).

HKC- (Regulation 18)

Responsibility of Stakeholders			
Regulation 16 - Authorize the Ship Recycling Facilities	Regulation 18 -Prepare an SRFP	Regulation 5 -Have on board an Inventory of Hazardous Materials -Finalize Inventory of Hazardous Materials including Parts II &III	Regulation 10 -Verify Inventory of Hazardous Materials, SRP and DASR
Regulation 9 -Approve SRP	Regulation 9 -Develop a ship specific SRP	Regulation 8 -Provide the information with the SRF	
Regulation 25 -Send a copy of the Statement to the flag State	Regulation 24 -Notify its Competent Authority of the intent -Report to its Competent Authority the planned start of Ship Recycling		
	Regulation 25 - Issue a statement of Completion and report to its Competent Authority		

All authorized SRFs shall prepare an SRFP, which shall be adopted by the board/appropriate governing body of the recycling company. The Hong Kong Convention establishes the necessary legislation to ensure that Ship Recycling Facilities (SRFs) are designed, constructed, and operated in a safe and environmentally sound manner, in accordance with the regulations of this Convention. The HKC also established a mechanism for

ensuring that SRF comply with the HKC.¹³ Taking into account guidelines developed by the Organization, the summary of Regulation 18 of the HKC is shown in a tabular form:

Table 2: Summary of Regulation 18 of the HKC

Ser.	Indicator	Concerned	Aim	Objective
1.	Policy	Workers	Ensuring Safety and Protection of Human Health	Minimization & elimination of the adverse effects on human health & environment.
		Environment	Ensuring Safety and Protection	
2.	System	Convention	Ensuring implementation of the requirements set out	Improvement of the procedures and standards used in the ship Recycling operations.
		SRF	Achievement of the goals set out in the policy	
3.	Identification	Employers & Workers	Role & Responsibility	Smooth ship recycling operations.
4.	Program	Worker	Providing appropriate information & training	Safe & environmentally sound operation of the SRF
5.	EPR Plan	SRF		Evacuation
6.	System	SRF	Monitoring the performance	Better production
7.	Record-Keeping	SRF	How Ship Recycling is carried out	Easy dismantled
8.	System	Workers	Reporting discharges, emissions, incidents and accidents causing damage or with the potential of causing damage	Safety of human health and the environment
		Environment		
9.	System	Workers	Reporting occupational diseases, accidents, injuries and other adverse effect	Safety of Human health

Ship Recycling Facility Plan

Before a ship is taken to the recycling yard, it is essential to have a SRFP. This guide explains how the ship-owner can include essential data in the SRP to ensure a secure and eco-friendly recycling process; the SRP serves as the primary document required for this procedure. The International Maritime Organization (IMO) and its members established the HKC 2009 for the Safe and Environmentally Sound Recycling of Ships. All organizations authorized by the local Competent Authorities or any other body recognized by them must have a SRFP. This plan is primarily referred to when granting permission for a ship recycling facility. The SRFP guidelines and regulations are set in order to guarantee the safety of people and nature before and after the ship recycling process. Therefore, they strive to ensure that these vessels will not have a negative effect.

¹³N. Mikelis, IMO. (2010, July 14-16). Ship Recycling Technology & Knowledge Transfer Workshop. Introduction To The Hongkong Convention And Its Requirements. Izmir, Turkey: International Maritime Organization.

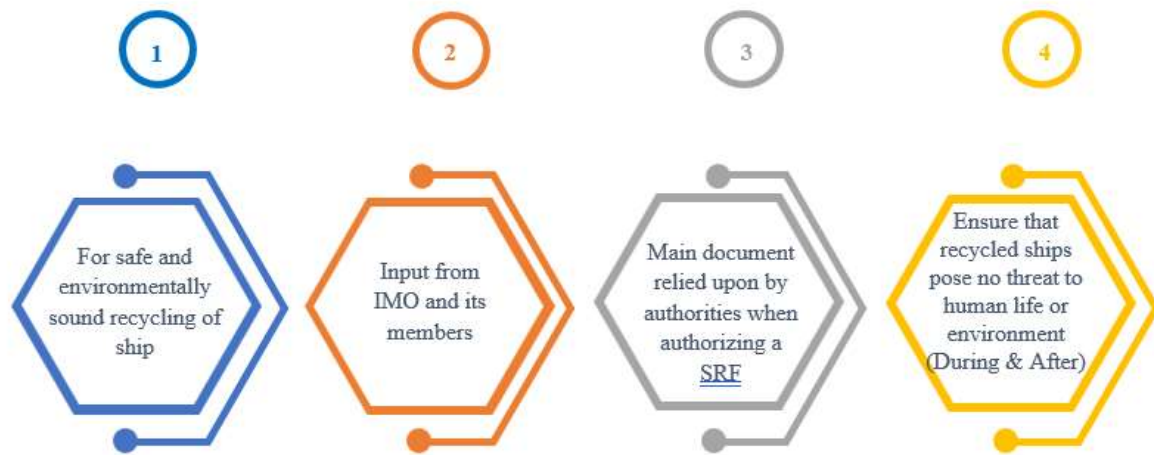


Fig 2: Ship Recycling Facility Plan (SRFP)

Ship Breaking and Recycling Rules, 2011

As per ‘The ship Breaking and Recycling Rules, 2011’ – the local authority allots the yards to the ship recyclers to the purpose of ship breaking and recycling. SBSRB under the Ministry of Industry of The People’s Republic of Bangladesh shall approve the SRFP in prescribed form with the following documents (The ship Breaking and Recycling Rules, 2011).¹⁴

Items Mentioned in the Ship Breaking and Recycling Rules-2011 (Regarding SRFP Article 15) is given in the Following Table:

Article	SI. No.	Items Mentioned in the Ship Breaking and Recycling Rules-2011 (Regarding SRFP)
Availability of Requisite and Valid Documents (15.1)	a.	Authorization for handing hazardous waste generated from ship recycling activates issued by the DOE.
	b.	Registration as a Trade Body’s Member and Member of the Hazardous Waste Treatment, Storage and Disposal Facility (TSDF) Which will be facilitated or operated by SBSRB under Ministry of Industries.
	c.	License of storage of L.P.G., Acetylene, Carbon dioxide, Oxygen & all other cylinder and flammable liquid.
	d.	Map Showing the yard layout and other components of the facilities.
	e.	Obtained license and SRFP approval from SBSRB.
Availability/	a.	Storage go down for temporary storage for Hazardous/Non Hazardous Waste/Materials.

¹⁴The ship Breaking and Recycling Rules. (2011). Retrieved from Ministry of Industry.

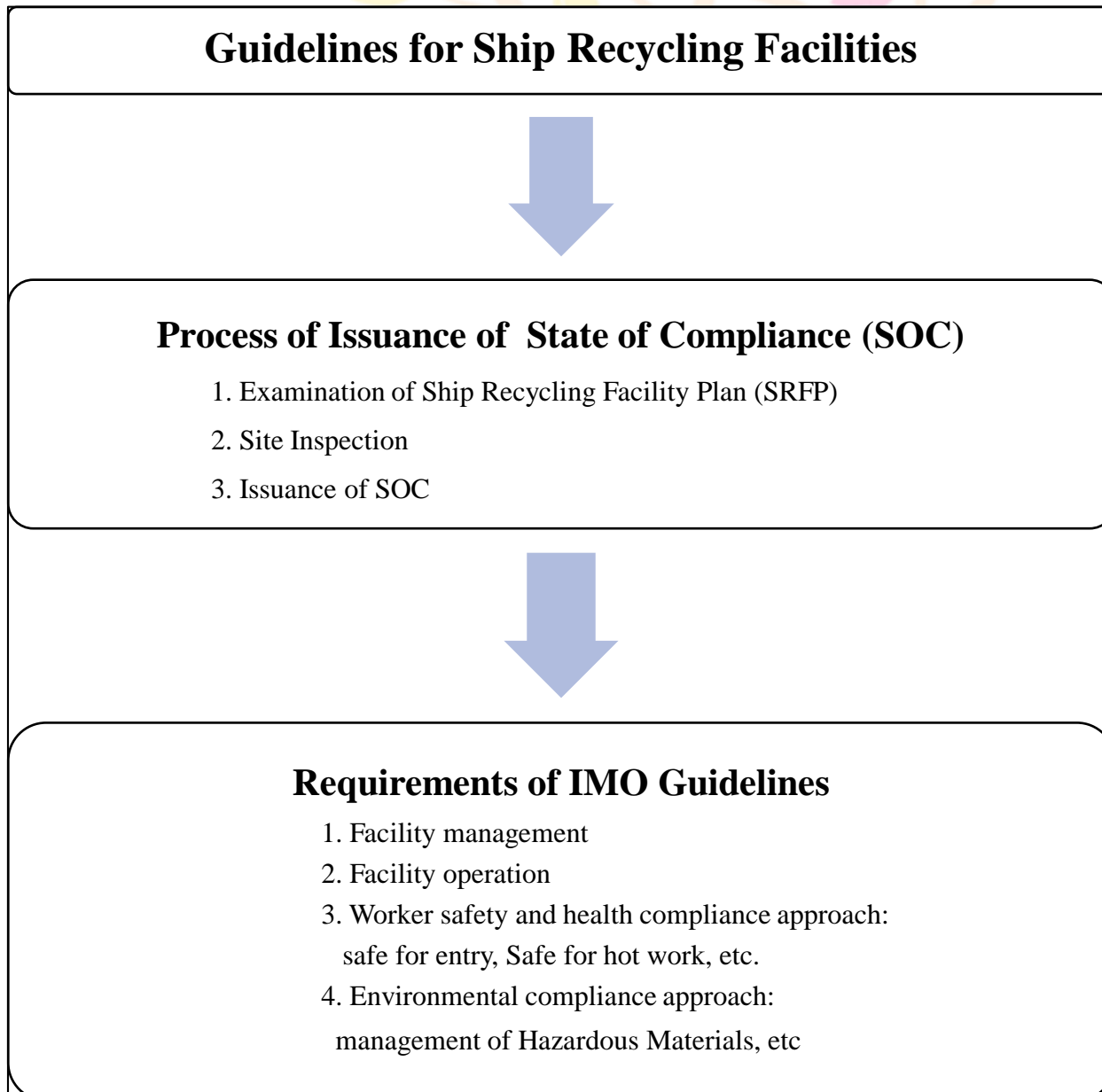
	b.	Asbestos handling & removing and storage facility (Negative Pressure Chamber).
	c.	Sanitation and rest room facilities for minimum 50 works.
	d.	Facility of adequate and clean drinking water.
	e.	Workers change and refresh room.
	f.	First aid facility.
	g.	Fire fighting facility and Emergency Response System (ERS) including oil spill combat system.
	h.	Material Handling Equipment (MHE) and Personal Protection Equipment (PPE) of BSTI standard or equivalent.
	i.	List of the trained labors of all disciplines (Lightening, gas cutting, waste handling, working in confined spaces, using various gadgets like oxygen and other gas detectors, crane and material handling systems etc).
	j.	Other necessary facilities as instructed by Department of Environment.
	Comply as the SHE as per Labor Law 2006 (15.6)	a.
b.		A system for ensuring the implementation of the requirements set out in rules, the achievement of goals set out in the policy of the recycling company with a commitment to continuous improvement.
c.		Identification of roles and responsibilities of supervisors, contractors and workers.
d.		Appropriate training of workers and availability of adequate PPEs and material handling equipment has to be carried out by designated training institute.
e.		An Emergency Preparedness and Response Plan (EPRP) for the yard to be conducted by safety officer appointed from the panel of SBSRB.
f.		A system for monitoring the performance of the ship recycling operations by safety officer.
g.		A reporting system to the SBSRB need to be developed about ship recycling operations including system for reporting discharges, emissions and accidents causing damage or potential to cause damage to workers safety, human health and the environment due to handling of hazardous wastes/materials.

Article	SI. No.	Items Mentioned in the Ship Breaking and Recycling Rules-2011 (Regarding SRFP)
Ship Recycling shall	a.	A board displaying important precautions to be followed during ship recycling activity is installed at a prominent place on the yard and that such display is made in English or vernacular language as understood by the workers employed on such plot.

b.	All the equipment on the yard such as crane, winch, chain rope and shackles, generator set and any other safety equipment as may be prescribed from time to time, shall be installed, maintained and validate yearly.
c.	An explosive gas detector and an oxygen percentage analyzer are available in the yard in working condition.
d.	Proper lighting arrangement is made on the yard.
e.	No person under the age of 18 years shall be employed. No female worker shall be allowed to enter into the yards.

Statement of Compliance (SoC) as per 2012 Guidelines for Implementing SRFP in Bangladesh (MEPC 210 (63))

Guidelines for SRF as per the Class List based on the requirements of the IMO Guidelines are described below:



PROPOSED SRFP TEMPLATE OF 2012 GUIDELINES FOR SAFE AND ENVIRONMENTALLY SOUND SHIP RECYCLING IN BANGLADESH (MEPC 63/23)

1	Facility Management
	<p>1.1 Company Information</p> <p>Necessary company information should be provided in the SRFP like Operator of the SRF, Land or facility owner, the role, responsibilities and qualification of management personnel, Environmental, occupational safety and health management system, etc.</p>
	<p>1.2 Training program</p> <p>SRF should be developed a Training plan. The plan includes handling and management of hazardous materials, fire protection and prevention, first aid, oil spillage on sea and plot, gas cutting operation, working at height confined space entry, removal of ACM, crane and forklift operation, etc. Training records are properly developed and maintained.</p>
	<p>1.3 Worker Management</p> <p>SRF should make a Worker Management plan. Every employee is registered and insured according to national requirements. Each worker and staff receives an ID-card with important information from the SRF. The personal information, certificates, education, trainings, and licenses are maintained.</p>
	<p>1.4 Record Management</p> <p>SRF should be developed a Record Management System. HSE related records, such as environmental monitoring reports, medical check reports, manifests for hazardous wastes, are kept at SRF for at least 5 years. Safe for entry permit and safe for hot work permit are kept for at least three month after finishing related work.</p>
2	Facility Operation
	<p>SRF should confirmed the Facility information, Permits, licenses and certification, Acceptability of ships, Ship recycling Plan (SRP) development, Vessel arrival management, Ship recycling methodology, Reporting upon completion etc</p>
	<p>2.1 Facility information</p> <p>Necessary facility information is provided in the SRFP like Maximum capacity of individual ship for recycling, maximum annual recycling capacity, Acceptable ship types, Location map, Facility layout plan, etc.</p>

2.2	<p>Permits, licenses and certification</p> <p>Necessary permits, licenses and certification should be kept in the SRF like Permission for utilizing ship breaking plot, Explosive license for LPG, Certificates and licenses of subcontractors, etc.</p>
2.3	<p>Acceptability of ships</p> <p>Total estimated ship recycling capacity of facility, including the production throughput/capacity of waste materials processing and storage.</p>
2.4	<p>Ship Recycling Plan (SRP) development</p> <p>Specify the recycling activities and the order will occur at your ship recycling facility.</p>
2.5	<p>Vessel arrival management</p> <p>Any procedures implemented to secure vessels on arrival at the facility.</p>
2.6	<p>Ship recycling methodology</p> <p>Acceptability of ships, ship recycling plan (SRP), vessel arrival management, and ship recycling methodology are described in the SRFP.</p>
2.7	<p>Reporting upon completion</p> <p>The procedures of reporting upon completion are carried out (including documentation of any incidents and accidents).</p>
3	<p>Worker safety and health compliance approach</p> <p>SRF should confirmed the worker health and safety, Key safety and health personnel, Job hazard assessment, Prevention of adverse effects to human health (Safe-for-entry and safe-for-hot-work procedures, Drums, containers and pressure vessels, Prevention of falling from heights, Gear and equipment for rigging and materials handling, Personal protective equipment, etc). Emergency preparedness and response plan & Fire and explosion prevention, detection and response.</p>
3.1	<p>Worker health and safety</p> <p>The facility's policy statement regarding commitment to health and safety. Include an explanation of objectives set to control the risks to workers and those living near the facility.</p>
3.2	<p>Key Safety and health personnel</p> <p>Qualification and responsibility of key safety and health personnel, such as general manager and HSE department, is described in the SRFP.</p>

3.3	<p>Job hazard assessment</p> <p>Job hazard assessment (Risk Assessment) is carried out in the framework of OHSAS18001.</p>
3.4	<p>Prevention of adverse effects to human health</p> <p>Processes for identifying and assessing enclosed spaces or regions of the ship where the atmosphere is dangerous. It must be monitored to ensure they remain safe for entry and continuous operation, identifying and assessing areas of the ship where hot work may be undertaken. Personnel monitoring for heavy-metals exposure, protection of personnel, training, respiratory protection, torch cutting, permits and inspections to avoid any human injuries. Involving cranes, machines, mobile equipment, and aerial and man-lift systems, as well as a list of operator qualifications. on procedures and equipment used for the protection of employees from various risks associated with ship recycling.</p>
4	<p>Environmental Compliance Approach</p> <p>4.1 Environmental monitoring Environmental monitoring is carried out twice a year by the ship recycling facilities like Soil, Sea Water, Air, Noise, Drinking water etc.</p> <p>4.2 Management of Hazardous Materials (HM) The facility's process, control procedures and abatement methodologies relating to the safe and environmentally sound removal, labeling, storage, segregation, transport, treatment and remediation of any hazardous waste found on board (Include the sequence of removal as part of the ship recycling process).</p> <p>4.3 Environmentally sound management of Hazardous Materials SRF should be confirm & evaluate the status of the removal, storage & disposal methods for the hazardous materials. Hazardous materials subject to the survey:</p> <ul style="list-style-type: none"> • Asbestos (removal using a negative pressure chamber system, a dedicated storage facility, solidification) • PCBs (removal of all of the solid, muddy and liquid forms, a dedicated storage facility, incineration) • Ozone-depleting substances (removal of the solids & gases, a dedicated storage facility, delivery to the vendor) • Ship bottom antifouling paint (removal by peeling off, airtight container storage, incineration after delivery to the vendor) • Materials containing heavy metals (removal overboard, airtight container storage, delivery to the vendor) • Persistent organic pollutants (removal overboard, a dedicated storage facility, incineration after delivery to the vendor)

	<ul style="list-style-type: none"> • Radioactive materials (mainly smoke detectors) (removal in original form, a dedicated storage facility, delivery to the authorities) • Insulating materials such as glass, wool etc. (removal overboard, a dedicated storage facility, delivery to the vendor) • Paint chips, plastic waste, rubber waste (removal overboard, a dedicated storage facility, incineration after delivery to the vendor) • Medical waste (removal overboard, a dedicated storage facility, delivery to the vendor) • Electronic waste (removal overboard, a dedicated storage facility, delivery to the vendor) • Oily contaminated waste (rags, sand etc.) (removal overboard, a dedicated storage facility, incineration after delivery to the vendor) • Bilge water (removal overboard, an oily water separation device, the oil content is delivered to the vendor & the other content is given effluent treatment), etc.
4.4	<p>Prevention of adverse effects to the environment</p> <p>SRF should be prevention of adverse effects to the environment like spill prevention, control & countermeasures, storm-water pollution prevention, debris prevention & control, Incident & spills reporting procedures etc.</p>

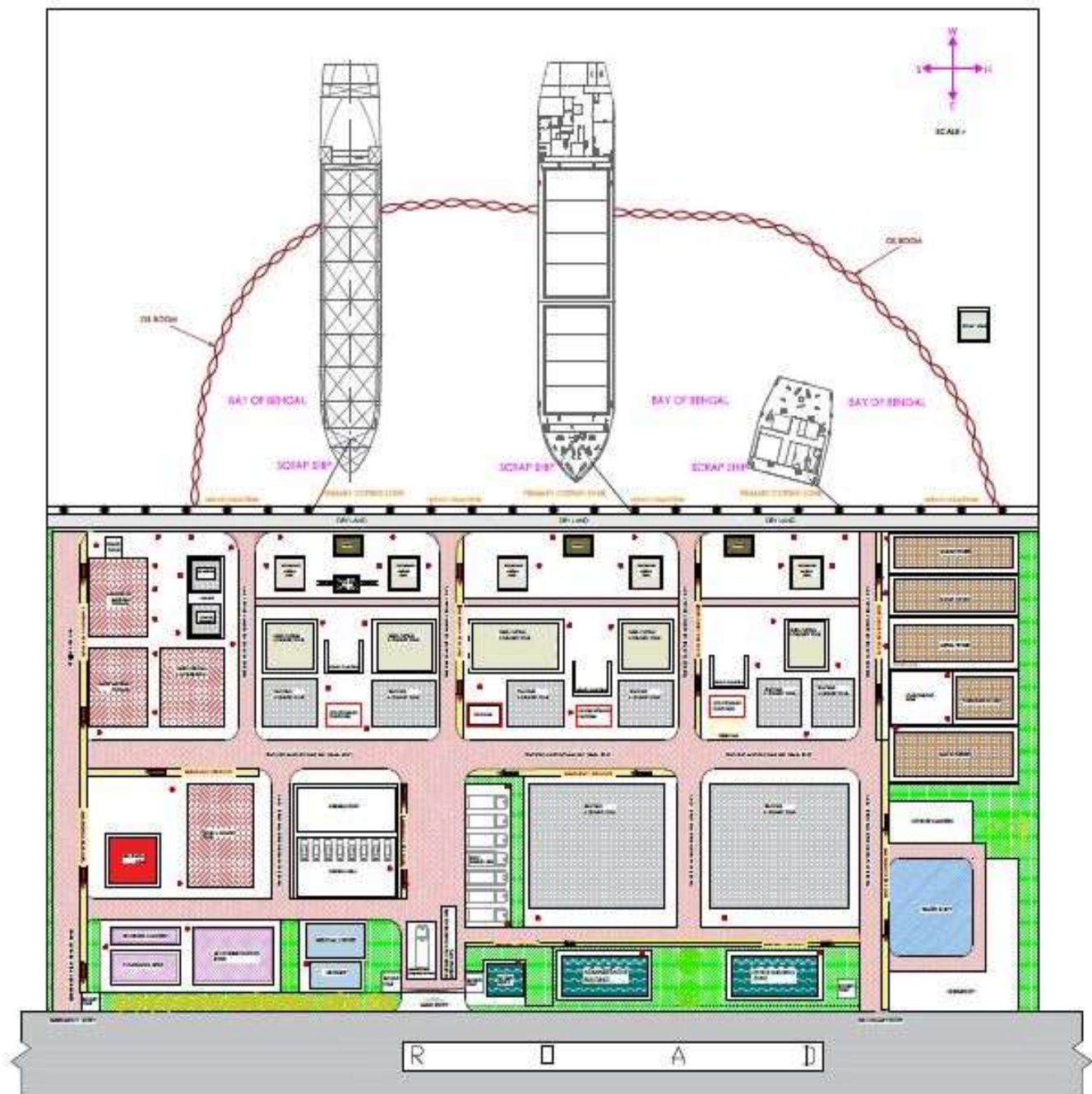


Fig 3: A Proposed SRFP Layout Map for Bangladeshi Typical Yard¹⁵

Conclusion

Statistics reveal that the global ship recycling industry dismantles around 1,000 large ocean-going ships annually, including container ships, cargo and bulkers, oil and gas tankers (LNG and LPG), passenger ships, and more, to salvage steel, metals, and recyclable materials.¹⁶ South Asia is the primary hub for ship breaking and recycling operations, with Bangladesh, India, and Pakistan accounting for 70-80% of the overall share. According to the recent data from an NGO platform, currently, 80% of ship-recycling activities take place in three locations: Chittagong (Bangladesh), Alang (India), and Gadani (Pakistan). The ship-breaking industry has

¹⁵HKC 2009& Bangladesh Ship Breaking & Recycling Rules-2011

¹⁶Hossain, K. A., 2019, "Development of an Assessment Model for Ship Recycling Industry in Bangladesh" Proceedings of the 2nd International Conference on Industrial and Mechanical Engineering and Operations Management (IMEOM), Dhaka, Bangladesh, December 12-13, 2019

made notable contributions to the economy of Bangladesh, and is of paramount importance to the macro and micro economies of poverty-stricken Bangladesh. However, beaching is heavily used in these areas. In response to the need for regulation on ship recycling, the IMO took swift action to create a new convention with legally binding provisions. This convention would heavily rely on enforcement from both the flag state and the recycling state. To eliminate any ambiguity of the BC in 2009, the IMO approved the HKC, which holds ship owners accountable for sustainable ship recycling. Even after a decade, this convention has not been implemented yet. The EUSRR furthers the goals of the HKC 2009 for Safe and Environmentally Sound Recycling of Ships, while introducing higher safety and environmental measures than those outlined in the IMO's HKC. Specifically, the EU's SRR contains standards that surpass those set by the IMO.

The EU's SRR seeks to achieve early ratification of the HKC, thereby promoting a global, rule-based system. European ships are usually recycled according to the EUSRR or HKC regulations. Otherwise, the BC guidelines come into effect, which can be quite tedious and difficult to manage. From a legal standpoint, the HKC has yet to be enforced; however, it can still serve as a guideline for non-EU flagged vessels when practicing due diligence. Besides, this protocol has been accepted and recognized internationally. One of the mandates of HKC is that an approved ship-breaking facility must create a SRFP (Regulation 18). The SRFP provides crucial information about a ship-recycling facility, including its layout, water depth, accessibility, routine maintenance, and dredging. South Asian recycling plants largely employ the open beaching system, which has been profitable, but can also release hazardous materials into the coastal region. Recently, EUSRR has come into effect. This law states that all ships registered under the EU flag must be recycled in a facility from the European List. Countries such as China, Turkey, and India are competing to bring their ship recycling facilities in line with global standards. Bangladesh's ship recycling yards need to strengthen their operations in order to maintain global standards and remain competitive in the world. Necessary improvements must be taken to ensure compliance with international regulations. It is absolutely essential for the country to succeed that we take a close look at existing ship recycling facilities and improve them to meet global standards; otherwise, we cannot survive in the global competition.

For effective and sustainable ship recycling practices, it is critical that the key players in South Asia (India, Pakistan, and Bangladesh) need to collaborate and work together. Doing so will enable the development and implementation of viable standards. In order to meet the requirements of the HKC 2009 and gain approved standards from EU regulation, Statements of Compliance (SoC) must be followed and a sustainable ship recycling process must be implemented by set up optimum SRFP in the local yards. There are around 150 registered yards under SBRI for ship recycling, of which a few dozen are actively operational. In 2011, the Ministry of Industry implemented two key regulations to oversee Ship Breaking and Recycling. The Ship Breaking and Recycling Rules 2011 and the Environmental Protection Act 1995 have implemented. The Ship Breaking Regulatory Authority was then formed to comply with these laws. To protect the environment, the Ministry of Environment and Forest has established the Environmental Protection Rules 1997. These regulations are essential for preventing environmental damage and maintaining a healthy planet. The Department of Environment (DoE) is solely responsible for enforcing the regulations. Before participating in any activities, ship recycling yards must acquire authorization from the DoE in order to continue their operations. This authorization is known as an Environmental Compliance Certificate (ECC). Yards are doing their best to keep their workers safe, and they have also become aware of the need for environmental conservation. As a result, some have been able to meet international standards for green ship-recycling practices. But something more need to do to implement SRFP in local recycling yards and ratify HKC 2009 by the nation within 2023. There need combined effort both by government enforcement bodies and related stake-holders as well as other international bodies.

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