PRACTICE OF GREEN SHIP RECYCLING IN BANGLADESH: A STUDY ON KSRM STEEL LTD.

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ABSTRACT

It is now great concern to become a conscious about environment by all sector of the county for developing sustainable environment of production and business. This is the driving force for changing the ship recycling process and convert the recycling process to green ship recycling. Green ship recycling is environmentally sound and safe recycling of a ship that offers methodical dismantling of the components with better care that can be reused; procedural capturing of the toxic and hazardous waste which poses harmful and dangerous risks to both marine and human health, safety and finally dispose them to mitigate the risks and protect environment. There are around 150 ship-breaking yards in the country, and most of them are still reluctant to turn into green facilities due to the high cost involved. Most yards are reluctant to adopt the green ship-breaking standards because of the costs associated with the process. Currently, only three other yards are trying to achieve those standards (The Business Standard, 2018). To make the ship recycling industry as a green industry, associated risks and hazards to be minimized up to an acceptable level. Green ship recycling gives a heads up to sustainable business practices as it reduces the CO2 emission and reduces damage to the environment. The main objective of the research is to analyze the green marketing practices of ship recycling industry in Bangladesh through visiting Kabir Steel Ltd. The nature of the research is descriptive and qualitative. Data are collected through observation on Kabir steel Ltd. Kabir Group Ship Recycling practices green ship recycling fully equipped yard with required infrastructure according to national and international regulations which do not pose health risk to the workers and surrounding environment and hazard materials are collected by the properly trained personnel and stored in a safe container. and workers are well trained before going to the job and wearing PPE is mandatory before performing job. For smooth practicing of green ship recycling the ship recycling company must ensure waste management, workers safety, conscious about environmental impact .

Key words: Green ship Recycling, Ship breaking

1. INTRODUCTION

The recycling phase or the end-of-life phase is important in any industry and for any product that is produced. Ships are designed, engineered, built, and operated, maintained and recycled. The end-of-life value of large vessels correlates highly with the price of steel. Ninety percent of shipbreaking in the world is carried out in Bangladesh, China, India, Pakistan and Turkey. These potential hazards to human life and environment make national and international attentions and regulatory framework is being generated by many different international conventions and organizations. Green ship recycling is now a requirement due to enforcement of The European Union Ship Recycling Regulation (EU-SRR) adopted by the European Parliament and development of The Hong Kong International Convention for the Safe and Environmentally Sound Recycling of Ships, 2009 (IMO HKC, 2009). The convention defines Hazardous Material as any material or substance which is liable to create hazards to human health and/or the environment. Green ship recycling helps lower the adverse impact on the environment.

The government enacted the Bangladesh Ship Recycling Act in 2018 and asked owners of ship-breaking yards to adopt safe and environmentally friendly methods as per the Hong Kong International Convention,

Most yards are reluctant to adopt the green ship-breaking standards because of the costs associated with the process. Currently, only three other yards are trying to achieve those standards. India, China and Turkey have already turned their ship recycling facilities green as prescribed by the Hong Kong International Convention adopted back in 2009. Bangladesh had set a target to turn all ship-breaking yards into green facilities by February 2023, but the current situation poses uncertainties that this target is achievable within the deadline. (Business Standard, 2018).

2. SCOPE OF STUDY

Most of the ship dismantling now-a-days takes place in South Asia, on tidal beaches and under
unacceptable conditions from the point of view of safety and environmental protection. Different types of hazardous materials and rubbish are disposed and spilled from scrapped ships in a way that they often get mixed with the beach soil and sea water around. This way of disposal has a negative impact on our coastal environment and marine biodiversity. Moreover, physical, chemical & biological characteristics of the area are severely degraded. Considering this background, the serious nature and complexity of the problem at hand, this thesis looks at the present scenario green ship recycling through the management of that hazardous material and rubbish and improvement of working condition of the workers. Here, in this report present situation green ship recycling of Kabir Steel Ltd. (KSRM) was analyzed for the future possibilities, and ways to make this facility successful.

3. LITERATURE REVIEW

Worldwide, 674 ocean going commercial ships and offshore units were sold to the scrap yards in 2019 (NGOSBP, 2019). The steel, machinery and other scrap metals obtained from recycling ships are the valuable raw material and capital machinery for the country’s industrialization. But, most of the ship dismantling now-a-days takes place in South Asian tidal beaches under unacceptable conditions from the point of view of safety and environmental protection. The rate of accidents is high, many workers contract lethal diseases, and water, soil and coastal habitats are heavily polluted by hazardous materials from ships. (Ahuja, 2012).

Ship breaking activities is the process of a series of risky tasks because of existence of enormous quantity of hazardous substances, which pose threats to the environment and working people. (Zakari, 2012) identified the underlying problems of ship recycling industry and therein analyzed the nature of the problems aimed towards overcoming the obstacles in Bangladesh, suggesting that well designed plan focusing on technological, safety and environmental issues must be ensured to avoid human causalities of ship-recycling industry in Bangladesh. Hossain, 2015 stated that the social and environmental impacts of the ship recycling in Bangladesh considering the positive economical contributions and negative effects like lack of occupational health and safety standard. (Mmeremi et al., 2016) presented the scenario of hazardous waste management in developing countries. He identified that in developing countries, hazardous waste management systems lack a systematic approach to administer waste management programs; inability to effectively collect and manage wastes as well as to reduce the negative impacts of those activities.

(Du et al., 2017) presented the challenges and solutions for ship recycling in China. He identified that Chinese large-scale ship recycling yards have been taking advanced practices including site environmental protection, dismantling procedures and technologies, and safety management in ship recycling industry for environmental protection and the workers’ health and safety. (Du et al., 2018) illustrated hazardous materials analysis and disposal procedures during ship recycling. He pointed out practical measures and suggestions to deal with the hazardous materials in the ship breaking yards based on two case studies on Chinese yards about green disposal of the main hazardous materials during shipbreaking. (Hossain, 2015) presented the map the supply chain of ship recycling industry, considering the trade-offs and combinations of financial and sustainable values that, in many ways, determine these inter-organizational arrangements. In the ship recycling markets, the owner who is interested in selling the vessel usually approaches the brokers who are familiar with various cash buyers, who purchase end-of-life vessels for reselling to recyclers. After several rounds of negotiations with the cash buyers, the ship broker mediates the sale, for which he obtains a certain percentage of value of the contract as commission for his services. The cash buyer takes the legal ownership of vessel and resells it to recyclers.

The ship recycling yards compliant with either the international standards for health, safety and environmental (HSE) management or the international ship recycling regulations (For example, HKC and EU ship recycling regulation) are considered innocuous to environment, health and safety of the workers, and are referred to as ‘green’ recycling yards in this dissertation. The green ship recycling yards are not very popular among a large number of shipowners due to their inability to offer a good price compared to substandard yards. The price gap between the two is mainly due to the extra cost of maintaining high HSE standards and investment in recycling facilities and workforce welfare required for green ship recycling.

Green ship recycling is the future for the sustainable development in this industry. The shipping companies in Europe are now under legal binding to go for green recycling under the new regulation European Union -Ship Recycling Regulation (EU-SRR) for their own ships. Regulations worldwide are now coming enforce in regular days that in near future all the ships might be gone to green ship recycling and ensuring that all our ships are recycled in the most sustainable, safe and environmentally friendly way possible. To take that advantage, the ship recycling industry stake holder must implement the green marketing to attract the foreign ship owners to come to us for green ship recycling. The researcher basically emphasizes here the practice of green ship
4. METHODOLOGY

The nature of the research is descriptive. This study begins by providing a theoretical background based on which the research methodology for this work was chosen. This study uses documents, including newspaper reports, literature from previous research, reports from organizations like IMO and other relevant documents. Further, this report uses databases from several organization like NGO PLATFORM, UNCSAT for gathering data. The feedback from industry received during the visit in the industry used as a source of data collection used in this report. All the different sources of empirical data have been used for data triangulation i.e. to confirm the conclusions from the different sources for increasing reliability. Relevant data was collected through observation and other different sources including literature from books, journals and magazine using internet.

5. THEORITICAL FRAME WORK (INTERNATIONAL GUIDELINES FOR GREEN SHIP RECYCLING)

5.1 Ship recycling legislation

The global shift of the industry from developed, highly regulated nations towards countries with weak regulatory and enforcement systems came calls for international regulation to ensure the protection of human rights standards for occupational health and safety as well as the environment. Undoubtedly ship recycling is a representation of ‘green’ industry. So, to protect the future of these potential industries, international regulations regarding Shipbreaking should strictly be followed.

5.2 The Basel Convention (BC)

The Basel Convention covers hazardous wastes that are explosive, flammable, poisonous, infectious, corrosive, toxic, or ecotoxic. It represents a systematic effort to balance the desire to ship wastes internationally with the desire to reduce the risks to health and the environment caused by the mismanagement of wastes. Three elements are crucial for the application of the Basel Convention to the issue of shipbreaking: (i) proof that the waste will not be properly dealt with by the shipbreaking country, (ii) the legal recognition that ships are waste & (iii) an established ‘intention to discard’ by the owner of the ship (Hossain, 2006).

5.3 The Hong Kong Convention (HKC)

Following increased international criticism of the shipping industry’s scandalous scrapping practices, the International Maritime Organization (IMO) Hong Kong Convention for the Safe and Environmentally Sound Recycling of Ships (HKC) was adopted at a Diplomatic Conference held in Hong Kong, China, in May 2009 but the convention is not yet enforced due to the problem of ratification. The Convention sets standards for ship recycling and puts responsibility for enforcement on the vessel’s flag state and the recycling state. After the entry into force of the Convention, the development and maintenance of an Inventory of Hazardous Materials, which identifies the amount and location of hazardous materials onboard a ship, will be required for all ships over 500GT.

5.4 EU SRR

The EU Ship Recycling Regulation (EU SRR) aims to reduce the negative impacts linked to the recycling of ships by ensuring that proper vessel dismantling methods are used to achieve safe disposal or recycling of all ship components, including hazardous materials. The EU SRR sets higher standards than the IMO’s Hong Kong Convention – the beaching method is not allowed and requirements related to downstream toxic waste management as well as labour rights are included.

5.5 ILO Guidelines

To address major occupational and environmental health problem generated from Shipbreaking, the ILO have produced their guidelines to deal with various issues in this area. In 2003, as part of its “Safe Work” agenda, the International Labor Organization (ILO) established the Safety and Health in Ship breaking: Guidelines for Asian Countries and Turkey. The ILO Guidelines provide direction to those who have the responsibility to ensure occupational safety and health in the ship breaking yards.

5.6 Bangladesh Ship Recycling Act

The Ship Recycling Act 2018 Act of Bangladesh has mostly dealt with allocation of plots between recyclers and constitution of the Ship Breaking Board (SBB) which is the Competent Authority for regulating the shipbreaking activities in Bangladesh. As per the act, the ship recycling plan is essential which contains two parts as the Ship recycling plan and Ship Recycling Facility's Plan. The shipbreaking yard must have enough space for movement while
cutting ship. "Gas-free and fit for hot work" certificate is also essential which is issued by the Department of Explosive for avoiding accidents concerned with fire, explosion and deficiency of oxygen. However, the ship recyclers are required to strictly provide the environmental compliance in line with soil, water, air under Environment Conservation Act 1995 and other related national environmental act or law.

6. PRACTICES OF GREEN SHIP RECYCLING IN KABIR STEEL LTD.

The company was incorporated in the name of Kabir Steel Limited since its incorporation in 1985 and before it was operating in the different names. The company is developing its ship recycling facility in compliance with the requirements of Hong Kong International Convention HKC 2009. Now a days kabir steel practicing green ship recycling facility by considering some important facts.

6.1 Yard Development

The facility uses the beaching / intertidal landing method. Primary cutting of the hull is mainly conducted in the intertidal zone using the interior of the ship itself as an impermeable floor. The size of the combined working areas is approximately 35,000 sq. m. In addition to the working areas there are office buildings and hazardous waste and waste storage areas. The operation on dry shore is from built structures with cranes, winches and trucks, on concrete flooring. The secondary cutting area around 8,000 sq. m ends in an embankment towards the intertidal landing area. A bigger portion of the secondary cutting area are covered with concrete, with steel plates in designated cutting areas. Storage tanks, storage and separation areas, storerooms and offices, sanitary equipment, workers rest and recreation rooms, first aid room, emergency room and emergency chests, worker facilities, workshops and drinking water supply were identified on site.

6.2 Yard Equipment & Facilities

Dismantled materials after the primary cutting from the ship to shore are transported by crane, in appropriate containers for smaller parts, without contact with the intertidal zone. So, equipment and facilities for cutting & transportation of parts are the big part for complete the job. Heavy Equipment: Jib Crane: Sufficient, Mobile Crane: Sufficient, Magnet Crane: Sufficient, Weight bridge: Sufficient. Boat / Barge: Boat / Barge: Sufficient, O2 supply: In Bottles, Gas supply: Fixed CNG Supply, Compressed air: Portable Air Compressor, Fire extinguisher: Potable fire extinguisher/ Fire Pump, Waste oil treatment: Oily Water Separator, Electric power supply: National Power Grid / Stand By Generators. KSRM yard also include: Wastes Storage, Incinerator, Bale compactor, Shearing Machine.

6.3 Workers facilities

The facility has a worker dormitory complex on the plot with capacity of around 100 workers. This is primarily reserved for supervisors or persons with positions of similar responsibility. The rooms are furnished with beds and wardrobe lockers and sufficient light and fan. A separated dormitory is available within the premises for workers. The facility has common mess room, kitchen, toilets, recreation area and seats, drinking water plant and wash area. The yard is providing free accommodation and food for the workers with complimentary drinking water and electricity. The yard has planned to improve the living quarters of the workers with improved ventilation and wider sleeping space additional to the guideline set by the International Labor Organization. (ILO)

6.4 Personal Protective Equipment Facilities

The yard has prepared a PPE matrix based on all kinds of hazards related to specific types of works done within the facility by the HSE manager. Accordingly, all kinds of PPE for that specific job are provided by the yard to all the workers engaged with that job. A designated PPE room is assigned to storage and monitoring of the PPE.

6.5 Medical Facilities

The yard has permanent medical center run by an MBBS doctor with sufficient trained medical assistant for 24 hours service. The Centre has four bed and is suitable for treatment of minor injuries and first aid. The center has its own ambulance which is equipped with blue light, ambulance bed, oxygen apparatus and first aid locker, with one dedicated employee to maintain and drive it. The driver is trained and qualified for emergency evacuation, firefighting and first aid for any emergency.

6.6 Workers Training

The facility has an implemented safety induction training and re-training scheme for new and current employees. Subcontractors, as for migrating workers, must register with the required training certificates before start of work. All subcontractors are given safety induction training before commencement. Considering the work type aligned with work group, the yard has identified the training need for each type of workers and conduct in house and external training considering the TNI and Govt. requirements. No worker is sent for work without training.
6.7 Management of Hazardous Materials

Many of the materials produced from the recycling possess hazardous properties. As such they require appropriate management throughout their life cycle so as to minimize adverse effects on public health and safety or to the environment generally. The approved SRFP describes the Ship Recycling Facility's process, control procedures and abatement methodologies used for the removal, labelling, storage, segregation, transport, treatment and disposal of all such Hazardous Materials, which is already by the government of Bangladesh. The yard has several following storage lockers for different type of hazardous wastes as like Asbestos Containing Materials (ACM), Oily Water Tank, Solid Waste, Glass Wool, PCBs, Heavy metal and Chemicals.

7. SUGGESTIVE MEASURES FOR IMPLEMENTATION

For smooth implantation of green ship recycling the industry must change some factors. In this research already researcher have been discussed the current scenario of KSRM who is practicing green ship recycling in their current infrastructure. But in real sense green ship recycling needs more modification in the process, structure and management system because of uneducated workers .the yard owners are not about the green ship regulation and lack of safety precautions. In general, the ship recycling yard doesn’t have a proper standard operational procedure. The following alternative measures should be enforced during the practice of green ship recycling by the authors:

Facility Management: For making green ship recycling the ship breaking firm should develop clear job description and worker responsibility through proper training. Should also develop a written procedure contains the proper way for acceptance of ship and describe the procedures to be implemented before ship arrives.

Technical and IHM survey: For green ship recycling the owner should prepare the brief technical and IHM survey for the purpose of identifying the type, location and quantity of any hazardous materials and for making and/or labeling. All items should be clearly marked in an easily identifiable manner. In the preparation step includes sea and soil pollution. For example, the installation of oil boom top prevents oil spill.

Waste and Hazmat treatment: Ship recycling activities are divided into three zones; offshore, inter-tidal, and onshore. The recycling process consists of several steps, such as cleaning, de-coating, cutting an additional process such as hazmat and waste handling. The HAZMAT can be found in various sections of a ship such as; paint, insulation materials, toxic cargo and fuel residues, etc. (Faria et al, 2019). The hazard materials and waste should be applied after segregation and wastes are handled environmentally sound manner. It is necessary to ensure that all categories of recycling yards hire enough certified asbestos handlers. (b) Materials identified with the dangers of PCBs and ODS should be handed over to the approved vendors. In Bangladesh, the number of authorized vendors is minimal, and as a result, some yards adopt the process of landfills which is not done by maintaining a proper plan. (Mehtaj et al., 2022). So, Develop the ship recycling plan (SRP). For implementing green ship recycling the ship breaking company must make pretreatment before cutting and incorporating HAZMAT and waste management facility. It is also necessary to conduct a survey for Hazard Materials by assigned person and ensure the treatment of waste management in sound manner.

Workers Safety and health compliance approach: Investigation of occupational noise exposure in a ship recycling yard showed that ship recycling workers are at risk of experiencing occupational noise and there is a lack of appropriate hearing protection being used in ship recycling yards (Kurt et al., 2017). Green ship recycling implantation achieved by worker’s health and safety plan, preparing job hazard assessment document, ensure Safe-for-hot-work and safe-for-entry Procedure and supplying proper personal protective equipment for workers.

Develop the environment monitoring program: By establishing safe and environmentally sound ship recycling yards which are compliant with international regulations. (Faria et al,2019). This program aimed at prevent environmental pollution and negative ship recycling impact on environment. These Possible negative impacts during ship recycling may be divided into four main categories: 1. Releases of Hazardous Materials to ground and sediments; 2. Releases of Hazardous Materials to water; 3. Emissions of Hazardous Materials to air; and 4. Noise/vibrations.

Final report is completion report is issued with main particulars of ship recycling; qualification certificate of ship recycle yard. For proper green ship recycling the statement of completion of ship recycling, qualification certificate of Ship Recycle Yard and Sub-contractor, inventory of hazardous material handled and reported to Competent Authorities.

In addition, the related ministries (ministry of transportation, ministry of industry, ministry of environment) should be prepared for the guideline because there are lack of guideline and contradicting regulation between among the ministries.
8. CONCLUSION

The study represents the current scenario green ship recycling for ship recycling industry from Bangladesh perspective in reference to KSRM ship recycling. This is basically a new movement for ship recycling industry. By observing the Bangladeshi shipping industry, it is found that the ship owners are unaware about the green ship recycling for their recycling activities, basically workers safety. Occupational health and safety have been a highly discussed and controversial topic within the ship recycling industry.

In the past, a public image of secrecy, stubbornness and an overwhelming reluctance to change has been felt by the international community from the ship dismantling industry (Kurt et al, 2013). For green ship recycling the firms are still unconscious the environmental impact during cutting and after cutting of ship. The major problem is that the use of beaching method during ship recycling in Indonesia without regarding health and safety, and environment aspects (Makbul, 2010). At the end of a ship’s life cycle, the ship contains not only various recyclable materials but also a range of hazardous materials (HAZMAT) and toxic substances (Krause, 2005). If the all firms of this industry are conscious about above matters, then the industry can capable to ensure proper practice of Green Ship Recycling for ship recycling.

REFERENCES


