

Cluster Profile

Green Shipbreaking Yard (Recycling)



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1. Executive Summary

The shipping industry plays a fundamental role in societies and global economy, supporting international trade activities between geographic locations. The increasing environmental concerns, driven by regulations and market factors, require the shipping industry to change towards becoming more sustainable and environmental friendly (Green Shipyard)

The ship breaking and recycling industry (SBRI) converts end-of-life ships into steel and other recyclable items. Ship recycling offers the most environmentally sustainable way of disposing of old vessels, with virtually every part of the hull and machine complex being reused or recycled as scrap metal. Although the industry is beneficial from a life-cycle assessment point of view, over the years it has gravitated toward countries with low labor costs, weak regulations on occupational safety, and limited environmental enforcement. The “global shift” in the industry to countries with comparatively weaker regulatory systems is of particular concern as ships contain many hazards that can have significant detrimental effects on humans and the environment if not dealt with properly.

Currently, the global center of the ship breaking and recycling industry is located in South Asia, specifically Bangladesh, India, and Pakistan. These three countries account for 70–80 percent of the international market for ship breaking of ocean-going vessels, with China and Turkey accounting for most of the rest. Only about 5 percent of the global volume of such vessels is scrapped outside these five countries. This study focuses on the SBRI Pakistan to get a better understanding of the economics of the industry and the environmental impacts arising out of such activity and to explore possible ways in which such environmental effects may be mitigated.

2. Gadani Ship Breaking Yard Balochistan, Pakistan

Gadani ship-breaking yard is the world's third largest ship breaking yard located across a 10 km (6.2 mi) long beachfront at Gadani, in Balochistan, Pakistan. The yard consists of 132 ship-breaking plots. It is located about 40 km (25 mi) northwest of Karachi, the largest city of Pakistan, In the 1980s, Gadani was the largest ship-breaking yard in the world, with more than 30,000 direct employees.

However, competition from newer facilities in Alang, India and Chittagong, Bangladesh resulted in a significant reduction in output, with Gadani today

producing less than one fifth of the scrap it produced in the 1980s. The recent reduction in taxes on scrap metal has led to a modest resurgence of output at Gadani, which now employs around 6,000 workers.

More than one million tons of steel is salvaged per year, and much of it is sold domestically. In the 2009-2010 fiscal years, record 107 ships, with a combined light displacement tonnage (LDT) of 852,022 tons, were broken at Gadani, whereas in the previous 2008-2009 fiscal year, 86 ships, with a combined LDT of 778,598 tons, were turned into scrap.

It is the world's third-largest ship breaking yard has witnessed numerous disaster in recent year, On 1 November 2016, at least 14 people were killed and 59 burned as a result of gas cylinder explosions on a ship being scrapped, the floating production storage and offloading oil tanker *Aces* (IMO number: 8021830, built 1982 as *Mobil Flinders*, causing a huge fire. Reportedly more than 100 people were dismantling a tanker in the yard. Some 30 other workers were also reported missing. By November 2, 19 people were reported dead and the tanker was still on fire.

3. Hazards associated with Ship Breaking

The most common hazards in the sector are related to workers health with five categories namely serious accident related hazard, Physical hazards, Mechanical hazard, Biological hazard and Ergonomic and Psychological hazard In addition to this taking a huge toll on the health of workers, ship breaking is a highly polluting industry. Large amounts of carcinogens and toxic substances (PCBs, PVCs, PAHs, TBT, mercury, lead, isocyanides, sulfuric acid) not only intoxicate workers but are also dumped into the soil and coastal waters. Environmental protection is limited in most yards and the sound management of asbestos, polychlorinated biphenyls (PCBs), ozone-depleting substances (ODS), and a range of heavy metals is virtually nonexistent. Of late, some efforts at minimizing the release of such pollutants in the environment are emerging in Bangladesh due to intervention by the courts. Similar interest in improving the industry's performance is also developing in Pakistan.

4. Green Ship Yards (Recycling) Concept

Recycling has been widely accepted as one of the fruitful methods for waste management. Like any other industry, the shipping industry, indeed world's biggest polluters, also creates a huge amount of waste every day. While ships dispose hundreds of tonnes of garbage from day to day operations, the disposing of a ship

after it reaches the end of its service life also leaves a huge amount of waste, posing a potential hazard to the environment. The improper disposal of the ships in earlier days, especially when they were left unattended after discontinuation from the service, has created several graves of abandoned ships around the world. And, in the past decades, ship owners have also tried several other techniques; including Scuttling-the deliberate sinking of a ship, deep water sinking and shipbreaking, to get rid of their old vessels.

However, when recycling and re-using goods and products has become an important requirement now, the shipbreaking method has also witnessed the recycling of the parts of the vessel.

Moreover, with the rise in awareness towards the maritime environment, there have been several changes in the process, which have given rise to a new term – green ship recycling. International Maritime Organization Hong Kong International Convention for the Safe and Environmentally Sound Recycling of Ships, 2009 also strictly directed that vessels that are being recycled after their service lives should not pose any unnecessary risks to human health, safety and to the environment. As a viable alternative to other methods of shipbreaking that makes negative effects on the environment, green ship recycling has been introduced across the world. As a way of responsible ship recycling, this method reduces the amount of waste and also keeps the waste materials from shipbreaking out of the beaches, reducing its impact on the environment.

There are several reasons which have made the concept of green ship recycling popular and meaningful. But, the most relevant benefits among them are:

- Isolate those parts of the ship which are harmful and dangerous to both marine and human lives
- Conserve marine ecosystem by proper discarding of ship breaking waste
- Reusing those parts of the ship that are important and can be re-used successfully while making new ships, thus saving resources
- Help the ship owner benefit from the process by optimum utility of the ship's parts

The valuable components of a ship that are reused include steel, aluminium, silver and brass, among others. Since a major part of a ship's weight is in steel, the steel scrap from the vessel is being converted into bars and rods for several other uses. However, in addition to the metal that can be recycled, there are a number of the toxic components inside a vessel. These harmful substances include lead, asbestos, mercury and oil sludge etc. The inefficient shipbreaking methods,

especially those carried out on beaches than the dry-dock ship recycling facilities, allow these toxic and hazardous waste to be disposed of unsafely.

5. Implementation of IMO Hong Kong Convention and Basely points in Gadani Ship yard

Government of Pakistan has not developed any regulatory authority to impose IMO conventions points in local ship breaking process neither provisional government has any legal binding on yards men to impose IMO and health and safety process.

As both federal and Provisional government lack the capacity to enforce the SOPs that has been generated internationally which will cause downsizing of the sector, so it is propose to government to Form a JV with local Management firm to provide the required knowledge and Techniques to yards men or ship owners or provide them training with certification. And government should regulate that management company to give certificate's only to those agents who qualify the requirements of the company or follow company SOPs, those ship owner or yards men who don't bear the certification should not allowed to break or recycle ship.

As Management Companies are working in other countries like Turkey, India and Bangladesh Pakistan should develop such mechanism with Private held management company to enforce the Implications of IMO convention in local industry to promote safe and sound green ship yard recycling process.

6. TORs of Management Firm

Ship recycling industry has long been known for unacceptable conditions of the workers and for causing pollution and irreversible damage to the local marine environment.

Workers working in most ship recycling facilities are exposed to hazardous substances and they work without proper protective equipment. Recycling facilities having no containment equipment and facilities to deal with large spill and hazardous waste are a threat to marine environment and ecology of the area where the ships are dismantled. Hazardous substances generated during ship recycling if discharged into the atmosphere including sea, land and air causes pollution and irreparable damage to the environment. This is why it is very important to apply proportionate controls to ship recycling facilities.

The Hong Kong Convention 2009, adopted on 15 May 2009 under the auspices of the International Maritime Organization, covers the operation of ship recycling facilities in a safe and environmentally sound manner, and the establishment of an appropriate enforcement mechanism for ship recycling. The Regulation (EU) No 1257/2013's purpose is to prevent, reduce, minimize and, to the extent practicable, eliminate accidents, injuries and other adverse effects on human health and the environment caused by ship recycling activities ensuring, in particular, that hazardous waste from such ship recycling is subject to environmentally sound management. The Regulation is also aimed to direct ships flying the flag of a Member State (and not) to ship recycling facilities that practice safe and environmentally sound methods of dismantling ships instead of directing them to substandard sites as is currently the practice. The establishment of a European List of ship recycling facilities ('the European List') fulfilling the requirements set out in this Regulation contributes to those objectives as well as to better enforcement by facilitating the control of ships going for recycling by the Member State whose flag the ship is flying.

7. What Management Company offers

This management firm offer multiple functions to ship owners for recycling of ships, to hold records its provide Training, quality of equipment's proper way to dispose of waste, handling of ship while coming to vessel and handling of flammable substance available in ship, Audit Report is prepared according to criteria/requirements set out in the Hong Kong Convention 2009 and/or Regulation (EU) n. 1257/2013.

Certificate of Compliance, prepared if the final opinion included in the Audit Report is positive after the findings have been solved by the ship recycling facility and accepted by the firm.

The Certificate, where the expiry date is present, is renewable every five years and contains the written attestation that the ship recycling facility operates in compliance with the requirements set out in the Hong Kong Convention 2009 or in compliance with the requirements set out in the Regulation (EU) n. 1257/2013.

8. Training Content

Ship Recycling Regulations lay down requirements that ships and recycling facilities have to fulfill to ensure environmental sound and safe ship recycling. It provides training to get familiar with the IMO Hong Kong Convention, the EU Ship Recycling Regulation, and get practical assistance on how to develop and maintain

the Inventory of Hazardous Materials (IHM), Content of Training that Management Company offers are.

- Overview on HKC
- Preparation for IHM New ships
- Preparation for IHM for Existing ships
- Role of the surveyor
- Role of HAZMAT expert
- Certification & reporting

HazMats: Statistics-Training-Asbestos-Polychlorinated-Biphenyls-Ozone depleting Substances - Organotin Compounds (found in paint)

- Laws and Regulations: UN Regulations - EU-Regulations EU 1257/2013 - IMO Maritime

Regulations - Position of EU - SOLAS - MARPOL - Convention - Hong Kong Convention – ISO 30000:2009

- Introduction to preparation of IHM: System of sampling - Detailed checkpoints - Rule for safe sampling - Transport of IHM samples - Type of samples - Methods - Lab - Calculation of results
- Weight calculation - IHM examples
- Recycling Facilities
- Assessment of Recycling Facilities
- Ship Recycling Plan.

Ship breaking Process.



9. Annexure

- **Reference.**

Company name	Address	Contact detail
Rina Group	Unit 1703, 17/F., Tai Yau Building, 181 Johnston Road, Wanchai	https://www.rina.org/en/contacts
Marco polo marine	Marco Polo Marine Limited 66, Kallang Pudding Road #05-01, Hor Kew Business Centre Singapore 349324	https://www.marcopolomarine.com.sg
Lella green ship	Ship Recycling Yard No: 2 S.B.Y, Alang - 364 150, Dist. Bhavnagar, Gujarat, India.	https://www.leelagreenship.com/contact.html