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# The effective enforcement of national ship recycling regulations in India

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# THE EFFECTIVE ENFORCEMENT OF NATIONAL SHIP RECYCLING REGULATIONS IN INDIA

By

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**India**

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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): .....18/09/2017.....

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ABSTRACT

Title of Dissertation: **The effective enforcement of National Ship Recycling Regulations in India**

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The dissertation is a study of International and National regulatory instruments applicable on ship recycling industry in India and other part of the world. Main emphasis is on comparing these instruments with current available regulatory framework in industry and evaluate aiming on their strong points and limitations.

A detail study is conducted on the present scenarios of the ship recycling industry in the India and same time focus on present methods of ship recycling and the historical development behind them. The investigation is focus on the substandard recycling procedures, environmental hazards, generation of hazardous waste products and harmful gaseous, occupational safety and health of workers involve in the industry.

The various regulatory instruments developed by IMO, EU and other countries are explored with a view to introduce best green practices in the industry. In addition, the actions taken by these bodies towards improvement of ship recycling practices is evaluated and feasibility of introduction of same practices in Indian industry is examined. A detail study is conducted regarding present regulatory framework controlling ship breaking in India. The development of private standards to regulate the ship breaking by the industry is studied and their effectiveness is examined.

Finally, the evaluation of significance of India's role in making ship recycling as a sustainable, safe and environmentally friendly activity. Further, India's environmental norms, Legal regulations and development policies on ship recycling are assessed and analyse for development of industry, protection of environment and safety of workers.

KEYWORDS: India, ship recycling, regulatory instruments, occupational safety and health.

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## LIST OF ABBREVIATIONS

| | |
|---|---|
| **ACB** | Asbestos Containing Material |
| **AERB** | Atomic Energy Research Board |
| **CRZ** | Coastal Regulation Zone |
| **CSIR** | Council of Scientific & Industrial Research |
| **DGFASL** | Directorate General Factory Advice Service and Labour Institute |
| **DISH** | Director of Industrial Safety and Health |
| **DWT** | Dead Weight Ton / Tonnage |
| **EIP** | Environmental Impact assessment |
| **EPFO** | Employees' Provident Fund Organisation |
| **ERPS** | Emergency preparedness and response plan |
| **ESIC** | Employees' State Insurance Scheme of India |
| **ESM** | Environmentally Sound Management |
| **ETA** | Estimated Time of Arrival |
| **GEPIL** | Gujarat Environment Protection & Infrastructure Ltd |
| **GPCB** | Gujarat Pollution Control Board |
| **GT** | Gross Ton / Tonnage |
| **HKC** | Hong Kong Convention |
| **IHM** | Inventory of Hazardous Materials |
| **ILO** | International Labour Organization |
| **IMO** | International Maritime Organization |
| **IN** | Indian Navy |
| **LB** | Labour Bureau |
| **LR** | Lloyd's Register |
| **MARPOL** | Marine Pollution |
| **MEPC** | Marine Environment Protection Committee |
| **MD** | Material Declarations |
| **NGO** | Non-governmental organization |
| **NOSDCP** | National Oil Spill Disaster Contingency Plan |

| | |
|---|---|
| **OSH** | Occupational Safety and Health |
| **PA** | Port Authority |
| **PCB** | Polychlorinated Biphenyl |
| **PESO** | Petroleum & Safety Organization |
| **RSRS** | Responsible ship recycling standards |
| **SDoC** | Supplier's Declaration of Conformity |
| **SHE** | Safety, Health and Environment |
| **SMB** | State Maritime Board |
| **SoC** | Statement of Compliance |
| **SoF** | Statement of Fact |
| **SPCB** | State Pollution Control Board |
| **SRFMP** | Ship Recycling Facility Management Plan |
| **SRF** | Ship recycling facility |
| **SSRP** | Ship Specific Recycling Plan |
| **TSDF** | Treatment, Storage and Disposal Facilities |
| **UNCLOS** | United Nations Convention on the Law of the Sea |
| **UNCTAD** | United Nations Conference on Trade and Development |

# 1 INTRODUCTION

## 1.1 Background

The ships are the main work horses of shipping industry. Once ships get old, they are replaced by new ships and old one go for the ship recycling process. Ship recycling is one of the best ways to dispose any product and around 95 percent of the parts and equipment of a ship can be reused. There is no particular fixed age for ships to be scrapped because physical deterioration is a steady process. A brief look at Lloyd's demolition register shows the picture that sometimes ships as old as 60 years and sometimes as young as 10 years are scrapped. (Mishra & Mukherjee, 2009). The steel obtained from the scrapped ships are of high quality and fulfil the requirements of steel industries. The ship breaking industry has given birth to many subsidiary small industries that deals with metal to furniture of the ships. Although there are many serious concerns of pollution and OSH are attached, this industry is playing an important role in providing sustainable support to millions of person and their families. (Mishra & Mukherjee, 2009).

Worldwide more than 1000 ships are recycled every year and 95% of them are recycled in Bangladesh, India, China, Pakistan and Turkey (UNCTAD 2016). Due to cheap labour, big demand for scrap metal and low environmental concerns make these countries top players in ship recycling. The ship recycling industry is a source of many pollutants which affect the environment and have low safety standards. The Indian Government, NGOs and civil society are very critical to pollution and fatal accidents attributed to this industry. The ships are dismantled on open beaches without proper handling of hazardous wastes, which are very harmful to the sensitive environment of beaches (Chowdhury, 2011).

## 1.2 Objectives and Structure

The main objective of this study is to analyse and review various International and national regulations which are applicable in the ship recycling industry, especially in India and at the same time evaluate the effects of these instruments on the production and development of the industry. Further, the dangers, environmental risks, generation of hazardous wastes and the OSH issues associated with the industry will be examined. The main objective of this dissertation is identification of gaps in various regulatory instruments and measures to fill these gaps and ground implementation of these instruments to improve the conditions in the industry.

Finally, India's efforts, future plans and policies regarding the ship recycling industry will be evaluated. This will help to identify how India is contributing to making ship recycling a sustainable, safe and environmentally friendly industry.

The dissertation is divided into different chapters in a systematic sequence providing answers to the following important questions.

1. What are the main issues regarding present conditions and standard procedure of the ship recycling industry? (Chapter II)
2. Comparative analysis of the Basel Convention, Hong Kong Convention, 2009 and Regional approach and challenges posed during ground implementation? (Chapter III)
3. How is the ship recycling industry regulated in India? By public and private regulatory framework? (Chapter IV)
4. What are the various challenges associated with implementation of a new regulatory instrument? (Chapter V)

## 1.3 Limitation

The research does not cover the management, financial and investment aspects of the ship recycling industry. It will focus on overall general practices in the industry, and how well it has to be regulated by national regulation. The issues of improvement of national regulatory framework will be discussed viewing non ratification of the HKC by India. The challenges posed by the introduction of the HKC in India will be discussed and how early safe practices recommended in the convention can be applied

in the industry. This dissertation will concentrate on policies, legal domain and practices in the Indian ship recycling industry. At the same time, it will address innovative techniques and ideas that will bring revolutionary changes to the industry. It will get some inspiration from best operational practices and environmental protection measures, which if introduced will improve the industry. Therefore, it is an effort to evaluate both domains. It will further carry out an analysis of the problems faced by yards in introducing modern techniques for the ship recycling process.

## 1.4 Methodologies

The study was conducted by reviewing various documents, papers and specialized books published on ship recycling. A qualitative research was conducted to understand this topic. In order to understand and review different issues of regulatory framework related to the industry, various resolutions, guidelines, conventions, research papers, conference reports, various marine periodicals, specialized books and various other documents published by IMO and the Government of India were studied. To find critical reasoning of the topic various governmental policies and other official documents which are available for the public were referred to. The data of various ship recycling related activities used were obtained from the various individual via e-mail. The latest development in the industry were obtained from ship recycling yard owners, research academics, government officials, experts, worker's associations, NGOs and IMO officials via e-mail. The ship recycling in India is regulated by the Ministry of Shipping and Gujarat Maritime Board, therefore both agencies were approached for obtaining facts and figures. To understand the actual situation on ground a field research was also conducted by interviewing 40 workers involved in ship recycling in Alang. The questionnaire and details of the research is attached in Appendix1. Some of the information is solely based on the author's analytical interpretation of information gathered from various sources.

# 2 THE SHIP RECYCLING INDUSTRY

## 2.1 Introduction

The life cycle of a ship is divided into various stages from designing, ship building, operations and finally scrapping. As of January 2017, there are 90,917 ships operating in the world with a total tonnage of 1,552 million dwt (UNCTAD, 2016). Such a large number of ships needs to be disposed of once their operational life is ended. Generally scrapping of ships takes place under two conditions. First it takes place when the operation cost becomes more than the revenue it is generating, such as repairs and structure modifications and second, when the age of the vessel and market conditions make ships operations non-profitable for owner (Moen, 2008). More than 90% of a ship is made of steel and steel prices play very an important role in deciding the scrap market (Demaria, 2010).

**Table 1: Resources required to produce 3 million tons of steel through steel plant.**

| **Resources** | **Quantity Required** |
|---|---|
| Iron Ore | 13.9 Million Tones |
| Water | 180 Million Tones |
| Electricity | 6900 Million Tones |
| Land | 15000 Hectares |

Note: As per estimate 1 million tons of steel produce by ship recycling saves around 4 million tons of natural resource.
**Source**: (Mishra & Mukherjee, 2010)

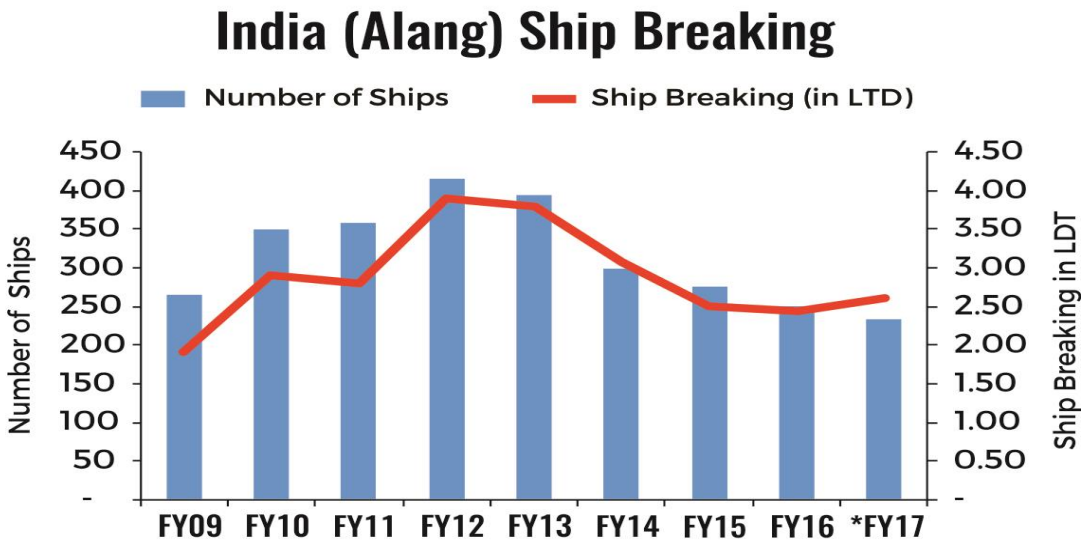
## 2.2 Ship Breaking Process

The ship recycling industry fulfilled approximately 1% to 2% of India's domestic steel demand. Therefore, the industry played a very important role in fulfilling the country's steel demand (Steelmint, 2017). The world biggest ship

breaking yard is located in Alang in the Gujarat state of India. The yard is controlled by GMB and around 40 thousand labourers work here. More than 400 ships are dismantled here and produce approximately 4.5 million tons of steel annually (Gujarat Maritime Board, 2017).

The unique geographical and climatic conditions make Alang beach an ideal location for ship recycling. It has tidal range of average 13 meters' difference. The beach has a slope inclination of 10 degrees with a firm and hard bottom. The yards in Alang are basically a piece of the open land called plot and there are nearly 180 active plots engaged in ship recycling all along a stretch of 12 km long beach (Despande et al., 2012). The suitable tidal condition, good value of scrap metal, cheap, experienced and managerial workforce; and use of Oxy-LPG torches result in lower consumption of energy for cutting the ships have made Alang the world's biggest destination for ship scrapping (Reddy et al., 2003).

**Figure 1:Number of ships recycled in Alang Ship Breaking yard till Feb 17.**

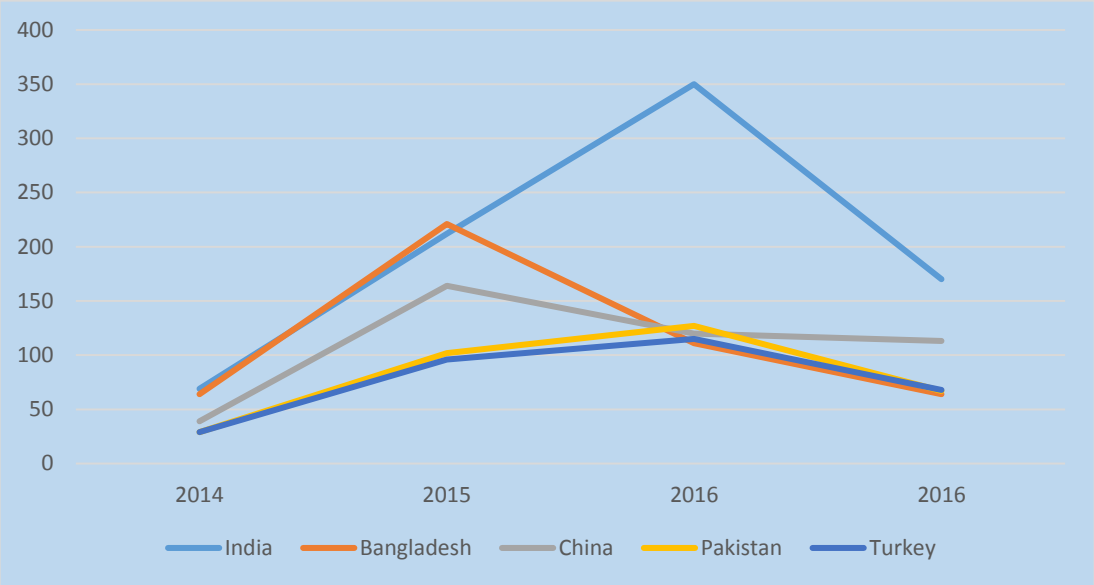



**Source:** (Steelmint, 2017)

The ship recycling process is divided into three different stages. The first is preparatory stage, in which the ship is prepared for her final journey and all the equipment not included in the contract and explosives are removed. In the case of a tanker, it must be declared free of explosive gases. The Gas-Free certificate must be obtained from any

recognised organisation. The second stage is when the ship is delivered to the ship recycling yard for final breaking. The ships are generally run at full speed towards the beach during high tide. The main aim of the crew is to take the ship out of the water as much as possible. Once out of the water, various scrap dealers will board the vessel and start removing non fixed items from the ship. Once this operation is complete, a final recycling plan will be prepared.

**Figure 2: Major Ship Recycling Countries – Total Ships**




**Source:** (Clarkson's, 2016)

The ship has to be dismantled properly so as to make sure that it should not topple over. Before the main cutting process starts the big opening are cut in the ship's hull. These openings act as a ventilation windows, which will reduce the presence of any harmful gases in closed compartments. The big metal parts are cut and dropped on the open land, which are further removed with the help of winches. The ship is gradually moved upward out of the beach when it is slowly broken down. The duration of the entire ship breaking procedure is depends on the length of the ship (Mishra & Mukherjee 2009). Almost all parts of ships are recycled and reused in various activities.

### 2.2.1 Dismantling Process

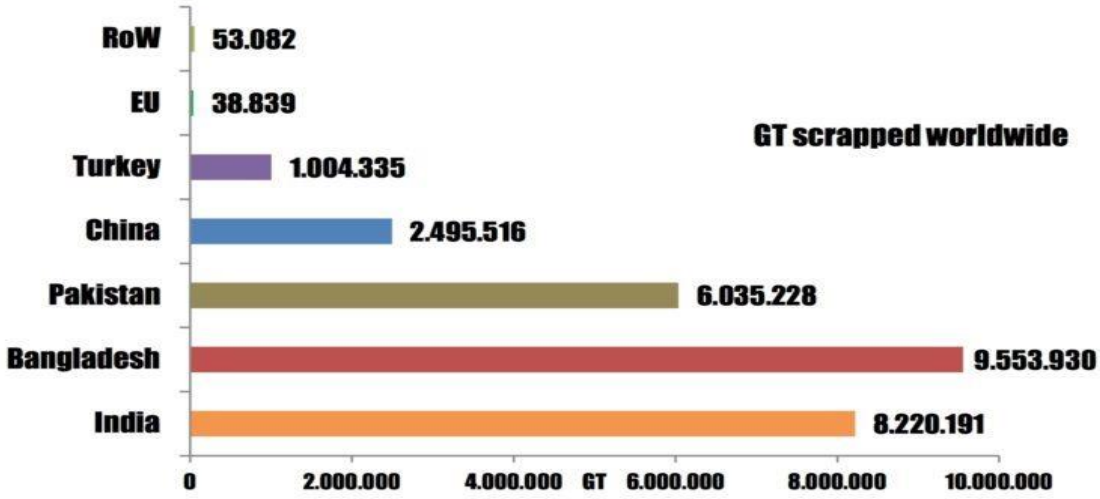
The dismantling process is as follows:

- Initial Inspection: The harmful material need to be identified before commencing the cutting process. This can be done in the initial inspection and is very useful for avoiding any accident and explosions.
- Removal of Liquids: The removal of ballast water, bilge water, fuel, oil residues and other chemical is very important to avoid its spillage on the beach during the cutting process.
- Removal of Equipment: All equipment of the ship is useful and having after life. Therefore, systematically all movable equipment is removed first. This provide access to those areas which were not accessible.
- Preparation for cutting: The surface is prepared by removal of paint from metal by using wire brushes, hammers and chemical spray.
- Cutting process: The cutting is done by use of oxy-acetylene torches also called Oxygen fuel torches. The upper deck fitting and superstructure are cut first, which make the ship lighter. Then with the help of shore based winches the ship is pulled further out of the beach. Once the entire hull is exposed, cutting of this part is also commenced. Finally, the bottom part and keel of the ship is cut down.

## 2.3 The Major Ship Recycling Nations

The ship recycling industry is flourishing in developing economies due to cheap labour, demand of steel and low environmental concerns. Due to this in the past two decades, the industry shifted its location from developed nations to developing nations. The industry is now mainly located in India, Bangladesh, China, Turkey and Pakistan. (Refer Figure 3 & Table 2)

**Figure 3: The GT scrapped worldwide**



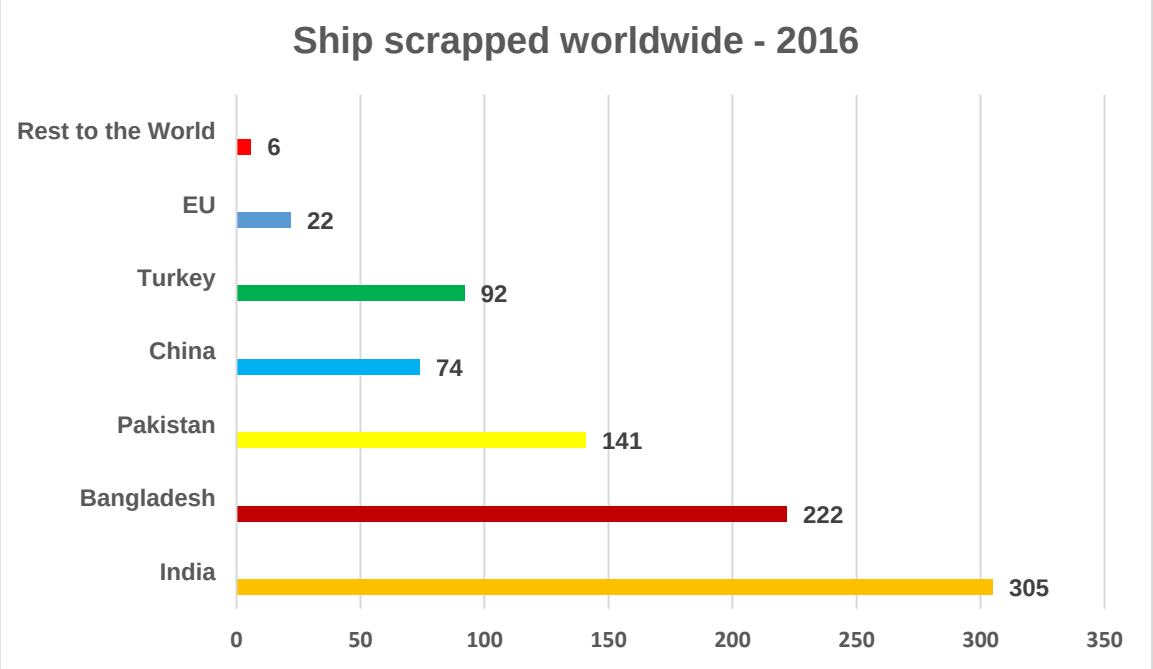

**Source**: (Schuler, 2017)

**Table 2: Ship recycling activity world over view**

| Country | No. of Ships | GT | Method used | No. of workers | HKC Signatory |
|---|---|---|---|---|---|
| India | 305 | 8,220,191 | Beaching | 40,000 approx. | No |
| Bangladesh | 222 | 9,553,930 | Beaching | 40,000 approx. | No |
| Pakistan | 141 | 6,035,228 | Beaching | 12,000 approx. | No |
| China | 74 | 2,495,516 | Alongside | 15,000 approx. | No |
| Turkey | 92 | 1,004,516 | Dry Dock | 2500 approx. | Yes |
| Rest of the world & EU | 28 | 91,921 | Dry Dock | - | - |

**Source:** (shipbreakingplatform, 2016)

**Figure 4: The Ships scrapped worldwide 2016**




**Source**: (Schuler, 2017)

## 2.4 Expected Forecast in Ship Recycling in India

In this part, quantitative methods will be used, more precisely, regression analysis to identify and evaluate factors, which may affect demolition price in the Indian ship-breaking market. As a sample, annual data, extracted from Shipping Intelligence Network in the United Kingdom and World Bank for the period from 1999 to 2016 are used, and as software, E-views application tool is used. The limitation of the study, identified during this research is small sample of data - only seventeen observations. This limitation exists because the first three variables can be found only per annum basis (not quarterly or monthly). After analysing the market of the ship-breaking industry, the following factors, which may affect demolition prices in Indian market, were identified:

- GDP of China: The demand of metals in China is very high due to rapid industrialisation. The growth of China plays a very important role in the prices of metal around the world.

- GDP of India: There is massive infrastructure development taking place in India and with a growth rate of 7%. This development required more industrial metal, which in turn affected the prices of metal.
- One-year time charter rate
- Indian steel production volume
- Steel production worldwide: Steel production is raw-material-intensive in nature. Iron ore, steel scrap, and coking coal are the key raw materials that go into steel production (X) (MT). Higher raw material pricing was among the key drivers of steel prices in 2016. Seaborne iron ore prices have almost doubled in the last year. That follows three consecutive years in which prices have fallen. Prices hit $83.60 per ton on December 12, 2016, the highest level since September 2014.
- Iron ore production worldwide**:** Due to cutbacks in domestic steel production of China there is a decrease in import of iron ore in China.

### 2.4.1 Empirical analysis.

Due to conducting a test on multicollinearity, which explains the relationship between variables, it was identified, that iron ore production worldwide highly correlated with steel production, which means that those variables will tell the same story. So based on the theory of regression analysis, one of those variables can be extracted from regression. Therefore, the final regression looks as follows:

**Table 3: Regression analysis for identification of factors affecting ship breaking industry**

View | Proc | Object | Print | Name | Freeze | Estimate | Forecast | Stats | Resids

Dependent Variable: RET_DEMOL_PRIC
Method: Least Squares
Date: 08/28/17 Time: 23:29
Sample (adjusted): 2000 2016
Included observations: 17 after adjustments

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|---|---|---|---|---|
| C | -12.18984 | 9.777129 | -1.246771 | 0.2363 |
| RET_GDP_CH | 1.395877 | 0.239565 | 5.826720 | 0.0001 |
| RET_IND_ST_PROD | -1.987341 | 0.877117 | -2.265765 | 0.0428 |
| RET_ORE_WORLLD | 4.146192 | 1.163170 | 3.564564 | 0.0039 |
| RET_TIME_CH | -0.372272 | 0.129381 | -2.877326 | 0.0139 |

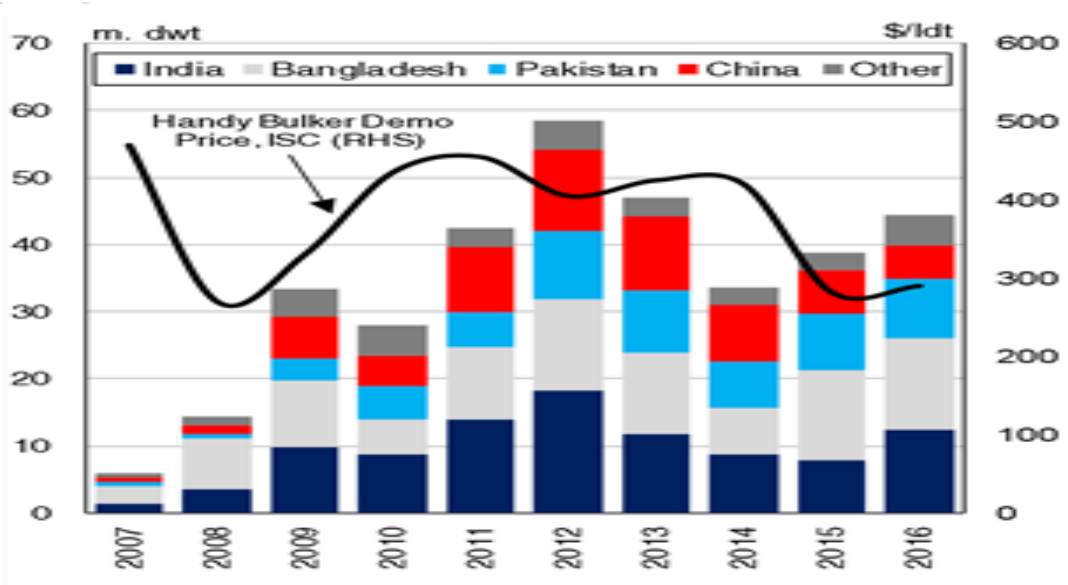
| | | | |
|---|---|---|---|
| R-squared | 0.832945 | Mean dependent var | 0.770913 |
| Adjusted R-squared | 0.777260 | S.D. dependent var | 29.51807 |
| S.E. of regression | 13.93117 | Akaike info criterion | 8.346063 |
| Sum squared resid | 2328.929 | Schwarz criterion | 8.591125 |
| Log likelihood | -65.94153 | Hannan-Quinn criter. | 8.370422 |
| F-statistic | 14.95813 | Durbin-Watson stat | 1.840191 |
| Prob(F-statistic) | 0.000130 | | |

**Source:** (EViews 9.5, 2015) & Data source - (Clarkson's, 2017)

During the process of running this regression, all the necessary steps were conducted such as: Unit root test, Blue stage (checks on Heteroscedasticity, Normality and Linearity), conducted Stability checks and all results were positive. Regarding the interpretation of results of regression, out of 6 variables, only four significantly affect the demolition price of the Indian ship-breaking industry. As can be seen, the adjusted R-squared is equal to 0.777, which means that those four variables on 77 % explain the behaviour of demolition prices. The Beta coefficient, which can be found next to selected variables express the next idea: the GDP of China will increase on 1 unit, it increases demolition price on 1.39 units. So there is the positive as well as the negative meanings of the beta coefficient, which can be interpreted as: Increase in Indian steel production on 1 unit will decrease demolition price on 1.98 units. Every year the percent of the world fleet is going for a scrapping process keeps on fluctuating depending upon the performance of the market. So introduction of new technology

and ageing is not the only reason for ships to be scrapped. The world economy is very sensitive and difficult to predict. The statistics of the economy has to be studied to actually understand what happened. So the prediction process should be seen as reducing the risk, rather than taking it as a reference for the final decision. Thus, scrapping end of the life vessels is a continuous process which provides a clear picture regarding the fate of a vessel after completion of its operational life.

**Figure 5: Demolition volume for last 10 years by shipbreaking countries.**




**Source:** (Clarkson's (2017)

In year 2016, total 933 ships were recycled in world wide. Total 44.4 million dwt was scrapped and recycling activity has increased by 14%. There is growth in industry despite decrease in steel prices.

## 2.5 Conclusion

The ship recycling industry play very important role by providing of metal resources and other associated products. In India the industry is concentrated in Alang, Gujarat. Geographical location, good value of scrap, low labour cost, use of basic technology and low environmental standards are some of the contributing factors towards development of this industry in India. The ship scrapping is well define process just like ship building. But it is less regulated as compare to later. The world economical patterns play a significant role in ship scrapping. Various factors like GDP of China and India, prices and production of steel affects the industry in a big way. These all factors are dependent of each other and responsible in scrapping of ship.

# 3 THE REGULATORY INSTRUMENTS FOR SHIP RECYCLING - INTERNATIONAL PERSPECTIVE

This chapter will cover various international and Indian legal framework in relation to ship recycling. It will also focus on various regulatory instruments applicable for the industry, some of which are already in force and some of which will be expected to be implemented in the future.

## 3.1 The International Labour Organisation

### 3.1.1 Introduction

ILO was founded in 1919 just after World War I with a vision that universal peace can be attained if people can get social justice. The main aim of ILO is to promote and maintain peace by ensuring labour rights and social justice of workers all over the world (ILO, 2017). The ILO has a unique tripartite structure where worker unions, employers and governments have equal rights to raise their concerns. It helps in better formulation of policies, labour standards and programmes (ILO, 2017).

### 3.1.2 Relevance of ILO in Ship Recycling

Shipbreaking is considered as a very hazardous occupation in the view of less salaries, low safety, health and environment standards. Therefore, the ILO developed guidelines “Safety and health in shipbreaking - Guidelines for Asian countries and Turkey - 2004”. Occupational hazard is one of the major areas of concern for workers in the ship recycling industry. The industry exposes workers to wide ranges of workplace activities that cause diseases, ill health, injuries and death (ILO, 2004). The workforce is a mix combination of migrant, casual and contract workers. These factors make the enforcement and implementation of laws difficult as compared to other industries (ILO, 2004 para 2.3.4).

### 3.1.3 OSH Management and ILO Guidelines on Shipbreaking

The ILO adopted a systematic approach to bring the working conditions up to reasonable standards in shipbreaking facilities. The ILO approach is more focused on investing in permanent structures, which can be easily reviewed, planned, implemented and evaluated. This view is very important in achieving environmentally sound conditions of occupational safety and health (ILO, 2004 para 4.1). Therefore, it is important to implement OSH management systems. The designs of these systems are guided by ILO according to their application at national level on the OSH management system (ILO, 2001). A system should contain a dedicated OSH policy, essential conditions for running the facility, i.e. responsibility, accountability, training, documentation, distribution of information and communication. A separate hazard and risk assessment plan, evaluation of OSH performance and improvement guidelines are an important part of this management system (ILO 2004 para 4.1).

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

### 3.2.1 Introduction

To control the exports of harmful wastes, in 1989 the Basel Convention was introduced. The shipping is an international industry and it is the common practice of sending old ships for dismantling to other locations therefore, the application of the Basel Convention on ship recycling was very difficult. In December 1999, a dedicated Technical Working Group was established in joint cooperation with the IMO to discuss the issues of ship recycling and to formulate some guidelines about this issue. Further, in December 2002 at a Conference of Parties Six the technical guidelines on the Environmentally Sound Management of the Full and Partial Dismantling of Ships (TGDS) were adopted (Puthucherril, 2010). Finally, in the decision 7 of the COP 7 in 2004, the parties recognised that a ship once going for dismantling will become waste (BC 1989, Article 2) and according to international rules it will be treated as a ship.

### 3.2.2 Objectives

The main objective of the Convention is to safeguard the general well-being of human beings and the environment from the effects of harmful wastes by strictly controlling its generation. The Convention is mainly focused on following areas:

a. The reduction in generation of waste and promote ESM of the wastes at disposal site (Article 4).

b. The interstate movement of wastes should only be allowed if it is regulated and controlled in a recommended way (Article 11).

c. Establishment of a regulatory system where transboundary movements are allowed. In Basel Convention, a ship when going for her end of life journey to the ship breaking yard is considered as a waste {Article 2(1)}.

### 3.2.3 Importance of Environmentally Sound Management System (ESM)

The ship recycling specific ESM concepts were explained in the TGDS in 2002 (Wingfield 2012). In other words, the ESM is combination of practical standards, regulatory instruments and effective control of the process of waste management. Furthermore, according to the Convention the following actions should be to taken -

(a) Minimum generation of waste {Article 4(2) a}.

(b) Establishment of adequate disposal facilities preferably in the country of origin of waste {Article 4(2) b}.

(c)Ensure the protection of the people engage in waste disposal and management process and at the same time try to minimize the harmful effects on their health {Article 4(2) c}.

(d) Safe transportation of wastes to avoid pollution during movement; at the same time try to minimize these movements {Article 4(2) d}.

(e)Each parties should ensure that ESM procedures should be implemented in all three states like export state, transit state and import state. In no point in time should the responsibility of export state be transferred to the import or transit state {Article 4(8) 10}.

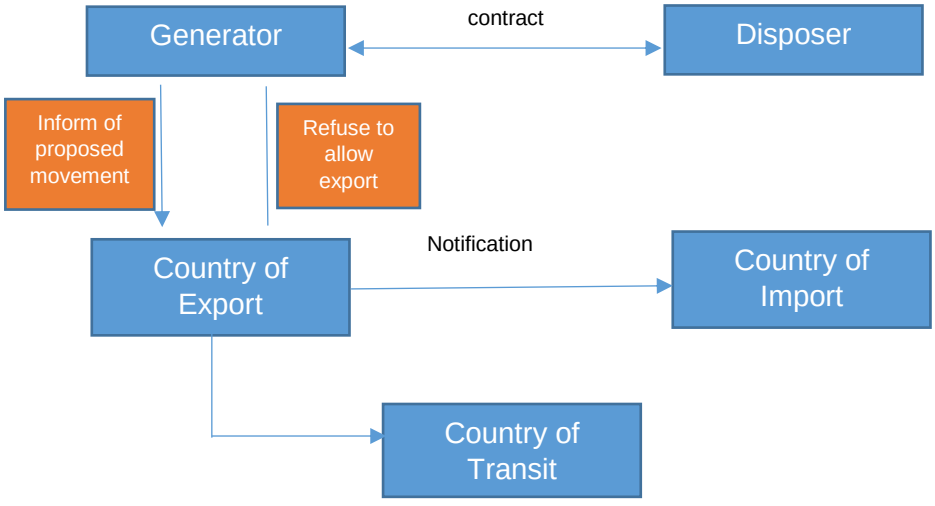
### 3.3 Important Features of Convention

A party can deny import of waste on its land at any time. Once the party put a ban on the import through proper notifications to other parties, then they should also put a ban on export of such wastes to the party {BC,1989 art 4(1)(a)}.

#### 3.3.1 Prior Informed Consent (PIC)

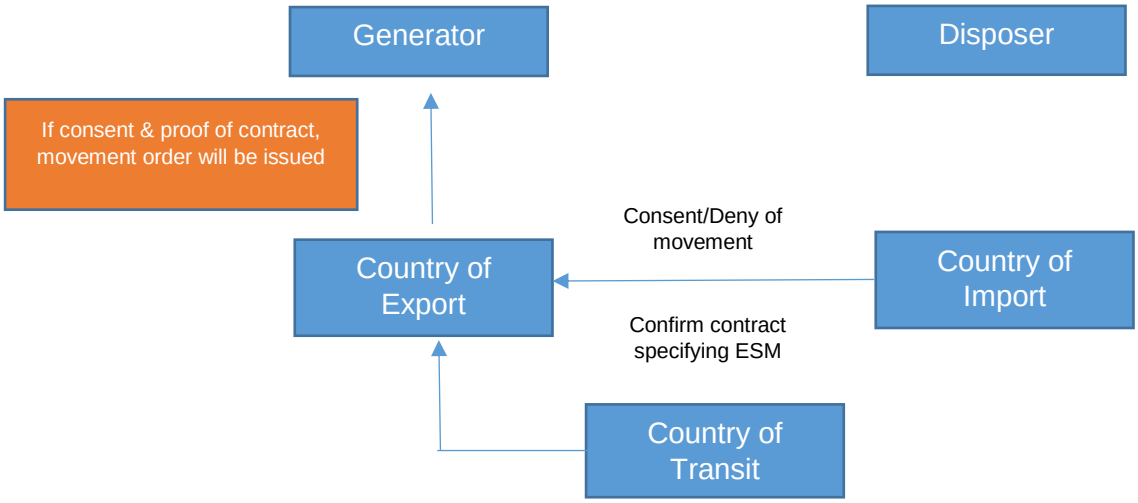
The Prior Informed Consent played very important role for movement of wastes. There are four steps in the PIC process under the Basel Convention - notification, consent and issuance of movement documents, transboundary movements and confirmation of disposal (Bellefontaine et al., 2014). In short, the receiver must be fully aware and informed about substances which should be recycled in its country. This principle has been adapted and inserted in the HKC.

**Figure 6: PIC procedure – Step 1 (Notification)**



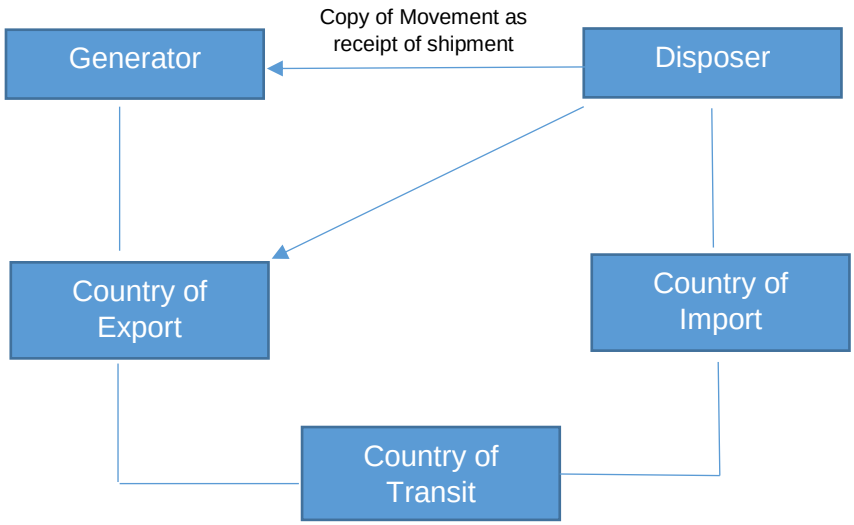

**Source:** (Wingfield, 2012)

**Figure 7: IC procedure – Step 2 (Consent/ Issuance of Movement documents)**




**Source:** (Wingfield, 2012)

**Figure 8: PIC procedure – Step 3 (Transboundary Movement)**




**Source:** (Wingfield, 2012)

### 3.3.2 Basel Convention and Ship Recycling - Brief overview

As already explained in the previous paragraphs, the convention bans the transboundary movement of harmful wastes and end-of-life ships going for recycling, as already explained in para 3.2.1, that a ship 'may become waste' once it is destined for dismantling and same time maintained its status of being ship. However, it is a big challenge to find out when and by whom a ship is declared to be destined for recycling. The biggest problem is that the ship owners hardly disclose their intention for dismantling and the location of recycling (Durak, 2009). The ships are always under the jurisdiction of their flag states. Due to the concept of open registry, ships can very easily change their flags. Due to this unique situation it becomes more difficult to establish relation between flag state and owner's country. Therefore, implement the provisions of export state as per Basel Convention on the ships destined for dismantling is difficult (Puthucherril, 2010).

## 3.4 The Hong Kong Convention for The Safe and Environmentally Sound Recycling of Ships, 2009

In October 2004, during the 7th meeting of the Conference of Parties of Basel Convention, the IMO was invited to formulate a regulatory instrument for controlling the Ship Breaking industry with the aim to fill the gaps left behind in the Basel Convention (Mikelis, 2012 & Puthucherril, 2010).

**Table 4: Time Line – HKC,2009**

| Date | Meeting | Remarks |
|---|---|---|
| July 2000 | 44th MEPC | Role of IMO in SR discussed |
| July 2003 | 49th MEPC | Guidelines on SR prepared |
| Dec 2003 | 23rd Assembly | Guidelines were adopted by resolution A.962(23) |
| Dec 2005 | 24th Assembly | Amendments to guidelines |

**Source**: (IMO, 2017)

In COP 7, the IMO adopted Resolution A.981(24) on 01 December 2005, Agenda item 11 (IMO, 2005). The aim of the resolution was to develop a new instrument with the aim to regulate the design, construction, operation of ships and working of recycling facilities. The IMO successfully prepared the convention and adopted the same on May 2009 in Hong Kong (IMO, 2017). The HKC is a product of joint cooperation of three different bodies i.e. IMO, ILO and the Basel Convention. The main purpose of the Convention is that it should be globally applicable and easily enforced (Durak, 2009). There are twenty-one articles in the HKC. Four Chapter of the Annex covers the technical details and there are totally seven appendices in the HKC.

### 3.4.1 The Main Aims of Convention

The main aims of HKC are as follows:

- To give recognition to ship recycling industry and to adapt the right procedures for ship dismantling.
- To work on the same principles of the Basel Convention by controlling the movement of harmful wastes.
- To work according the Rio Declaration, where states should not postpone cost effective measures to protect the environment due to lack of scientific knowledge (Rio Declaration on Environment and Development, 1992).
- To "promote use of environmental friendly materials in ship building and repairs. To identify the risk involved in ship scrapping industry and phased removal of ships that have reached their end of operational lives (HKC, 2009).

### 3.4.2 Core Objectives of HKC

It is obligation of all parties not to interpret any provision in such a way that its effectiveness is reduced during its implementation (HKC, 2009).

### 3.4.3 Flag States – Responsibility

The HKC specifies the idea of Flag state in article 3.1.1, which states that "Ships flying flag of the party or operating under its authority" similarly article 3.3 (sovereignty or jurisdiction), article 5 (authority) and article 12.4 (Party) covered the term flag state in different ways. The different terminology used for Flag state in the HKC creates legal ambiguities and confusion. Article 1 of the HKC enacts the general obligation on each Party to implement the provisions under this the Convention to protect environment and human health during ship recycling activity. The article 1.2 gives state parties' freedom to enacts stricter procedures for effective control. Similarly article 1.3 encourages the Parties to co-operate with each other for better implementation of the Convention and article 1.4 puts more emphasis on development of better technology for improving the activity. The responsibility of survey, certification and inspection by the state party on its ships is covered in article 5 and article 8. In accordance with article 10.1, wherever the violation occurs the Flag State has the authority and jurisdiction over that ship. The flag state shall take appropriate action according to its national law against such violation and inform the reporting state about status of case. Article 12, of the HKC made it obligatory for Flag State to report to IMO about following Information:

- Total number of ships issued with IRRC;
- Total number of ships recycled under its jurisdiction;
- Report of violations:
- Action taken against ships under its jurisdiction:

### 3.4.4 Role and Responsibilities of Port State

The responsibilities of Port State in the HKC are similar to that of the Flag State. The Port State can inspect a ship for compliance of convention. The inspection should be limited to check whether the ship is carrying a Certificate on IHM or an IRRC. Article 9.1 and 9.3 explains the powers of state in case of violations of HKC. The Port State is empowered by Article 10.2 of convention to prohibit and put sanctions as per its

national law against any violation of convention under the jurisdiction of the Port State. Under Article 11, the convention specify that Port State should conduct speedy investigations to avoid delay to the ships. This undue delay will entitle ships for compensation.

### 3.4.5 Ship-Owners Responsibilities

The HKC requires a ship owner to recycle his ship only at those recycling facilities that are compliant by HKC. Before sending the ship for recycling, the operations should be controlled in such a way that the ship should leave with minimum amount of oil and products. He has to provide all information to recycling facility for preparation of the recycling plan. The ship has to provide complete IHM (HKC,2009 Regulation 5). This inventory should be regularly updated by owner for full life of ship (Regulation 5.3). The ship owners have obligation to inform the administration about their intention to dismantle his ship.

### 3.4.6 Recycling State responsibilities

The recycling state has to ensure that the facility is operating as per the requirements of HKC (HKC Regulation 15.1 & Jain et al., 2013). The state should use provisions of inspection, monitoring, enforcement, power of entry and sampling. It can use the audit scheme and the results of this audits should be submitted to IMO (Regulation 15.3). Every recycling state shall nominate a Competent Authority, which will conduct site inspection of facility, documents verification (HKC, Regulation 16). The state should ensure that harmful material mentioned in Appendix -1 of HKC (see Appendix **Error! Reference source not found.**) should not be used by any of shipbuilding yards. The state should ensure that IHM need to be updated if any material listed in Appendix-2 of HKC (see Appendix**Error! Reference source not found.** ) is used in any repair. Recycling states are obliged to co-operate for any detection of violations by facility and same time for effective implementation of provision of convention (HKC 2009, Article 9.4).

### 3.4.7 Ship Recycling Facility Responsibilities

The Facility is required to prepare ship specific plan prior starting of recycling process. The plan has to be prepared according to the information provided by ship-owner (HKC, Regulation 9.1). The Ship Recycling Facilities can only accept ship for recycling process if it complies with the Convention or meet the requirements of the Convention (HKC, Regulation 17.2.1). It can only accept ships once they are authorised to recycle (Regulation 17.2.2). The facility has to provide suitable documents of its authorization to the ship-owner, who intend to recycle his ship at this facility (HKC, Regulation 17.2.3). The facility has to prepared a Ship Recycling Facility Plan (SRFP). This plan has to be adopted by Board or suitable governing body of the Recycling Company. The plan should have a detailed policy which ensured workers safety and human health and environment protection. The objectives of the policy should be set to minimise and eliminate the harmful effects of Ship Recycling on Human health and environment (HKC, Regulation 18.1). The plan should provide clear identification of roles and responsibilities of employers and workers (HKC, Regulation 18.3). The plan should have a training programme for workers, an emergency preparedness and response plan, record keeping system of facility. A reporting system should be incorporated in the plan for reporting various emissions, discharges, incidents, accidents, occupational diseases, injuries causing damages to workers and environment (HKC, Regulation 18.8.9). The facility has to establish the measures which will prevent adverse effects to human health and environment caused by explosions, fire, dangerous atmosphere in confined spaces, occupational diseases, injuries, spills and emissions (HKC, Regulation 19). The facility has to ensure safe and environmentally sound management of hazardous materials. The hazardous material should be identified, removed, packaged and labelled by well trained and equipped workers (HKC, Regulation 20). In order to deal with emergency situations, the facility has to maintained an Emergency Preparedness and Response Plan. The location, environment, size and nature of activities should be taken into account while preparing this plan (HKC, Regulation 21). The facility has to ensure the safety and training of workers by providing personal protective equipment (PPE), clothing, training,

familiarization about Ship Recycling operations (HKC, Regulation 22). The Ship Recycling facility has to prepared a suitable mechanism for incident reporting (HKC, Regulation 23).

### 3.4.8 Challenges to the Hong Kong Convention

There are different types of ship recycling methods around the world (beaching, in closed yards, in sliding form, alongside, etc.). The most controversial method of ship recycling is scrapping of the ships on the beach, widely known as "Beaching". In this the ships are getting dismantled in open intertidal beaches, where it is nearly impossible to contain pollutants such as asbestos, toxic paints, metal parts, oil residues and other hazardous substances on board. Due to continue tidal movement these hazardous substances get transferred to sea and pollute it. In the case of fire and explosion it is nearly impossible for fire-fighting trucks and ambulances to reach the site of incident. The shifting of heavy metal plates is not possible because heavy cranes cannot reach to the area of cutting view soft sea bed. Therefore, the facility uses manual labours to shift these plates on their shoulders, which further leads to many fatalities and injuries. It is nearly impossible to carry out effective waste management in ecologically sensitive intertidal zones near beaches. The HKC has put no ban on beaching, but adopted an indirect approach by promoting worker safety, training, preparedness and response for emergency, monitoring and reporting of events (Jain et al., 2013). In the preview of Convention, a recycling facility located in non-signatory member state can recycle ships from party member state. This can be done easily by changing the flag of ship to that non-member state (Jain et al., 2013).

According to T. G. Puthucherril, (2010) the final disposal and treatment of hazardous material recovered from the ship after recycling process is barely considered in the Convention and left to the ship recycling country (environmental sound management). The Article 2.10 of Convention clearly explained the terms "Ship Recycling" as a process of dismantling the ship in order to recover equipment, material and components for reuse. It also covered storage and treatment of hazardous material but no further mentioning about disposal in separate facilities. This give chances to

stakeholders to take advantage of situation and not to be honest towards the aim of environmentally sound and safe industry.

The HKC has given exemptions to some ships according to their role and operations. The HKC is not applicable to war ships, auxiliary vessels or other ships operated by government (Article 3.2). In addition, ships under 500 gross tonnage and ships operating throughout their life in domestic waters are exempted from the purview of the Convention (Article 3.3). It has seen that warships and naval vessels are the large source of hazardous materials like asbestos and chemicals. Therefore, their recycling process need to be more regulated. These exemptions are the major roadblock in the process of complete removal of substandard practices in ship recycling industry. The exemptions to any regulatory framework make it less effective because this increases the chances of circumventing the provisions according to feasibility of individuals. The Convention is silent about upgradation of ship recycling facilities by positive investment and encouragement. Due to the large numbers of small yards involve in the industry with very limited capital investment, it is difficult for them to introduce environmentally sound and safe recycling practices. In absence any financial support mechanisms, it is very difficult to motivate the big ship recycling states to sign the Convention (Moen, 2008).

## 3.5 The Regional Approach for Improving Ship Recycling Industry

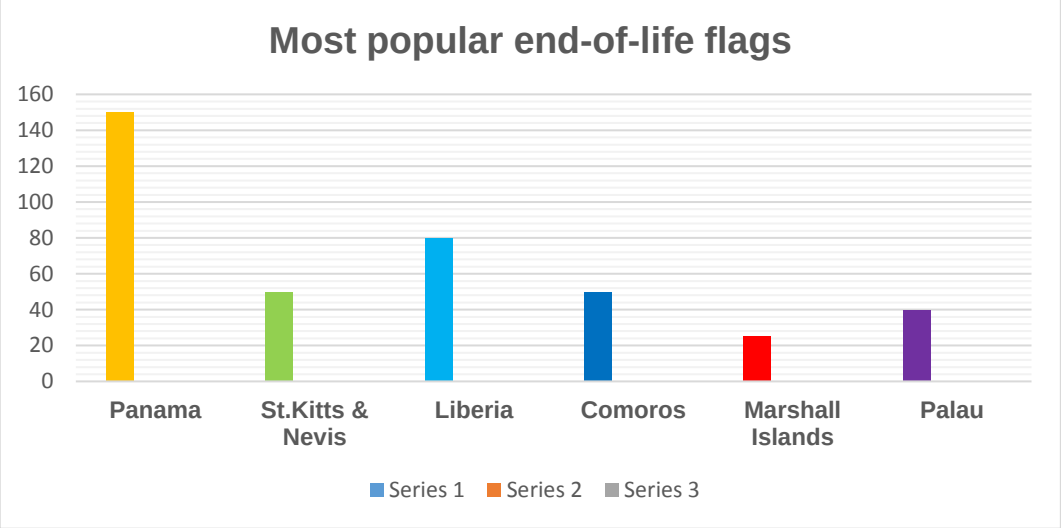
In this section, we will discuss the approaches adopted on regional level to address the problems related to the Recycling Industry.

### 3.5.1 The European Union

Around 40% of world's merchant fleet is owned by Europeans. Only 22% of vessels are flying EU flags (Clarkson's, 2017). It is common practice of changing the flag of the ships when it is destined for scrapping to the countries with poor flag records. These types of registries are used for avoid stringent environmental and worker's protection legislations which if implemented will lead to high operating cost. Around 73% of the world's fleet are registered in the countries other than the native countries of owners (Clarkson's, 2017). This percentage increases dramatically when it come to

the recycling of the ships. In 2016, nearly 40% of all end of life ships beached on the beaches of South Asian countries were changed their flag just before recycling. Particularly to the flags which are grey or black listed under Paris and Tokyo MoU. These flags are having poor records and they offered quick, hassle free short term registration without disclosure of owner's nationality. Sometimes these flags offer special discounts on the last voyages perform by the ships to the recycling yards. In 2016, one third of total 78% of ships scrapped on beaches of south Asia were owned by Europeans (Shipbreaking Platform, 2016).

**Figure 9: Most popular end-of-life flags**




**Source:** (Schuler, 2017)

### 3.5.2 Actions by EU for Regulating Ship Recycling Activity

As discussed earlier that it is very difficult to identify the ship-owners intentions about scrapping. They easily avoid the regulations by changing the flag just before the scrapping. By keeping these points into consideration the European Union proposed a new regulation in March 2012, called Ship Recycling Regulation. The main objective of regulation is reduced the negative impact of unsafe recycling activity on the member states. Once the ships are covered under new regulation they will be excluded from parameters of WSR (EC) 1013/2006. This will reduce the administrative burden and provide legal clarity (European Commission 2016). According to the regulation it is obligation of all member states that the vessels flying their flag may be recycled in

safe and environmentally sound recycling facilities. These facilities need to be included in the European List of Ship recycling facilities. To be included in the list, the ship recycling facility has to fulfilled number of safety and environmental requirements as mentioned in the regulation. These requirements were first issued on April 2016 by commission as a technical guideline for operations. The facilities located in any third countries are also eligible for inclusion into the list. The EU flagged vessels are allowed for recycling into these facilities once they are included into the list. The ship-owner has to notify the EU member state about his intention for recycling of his vessel. He has to provide detail schedule of entire recycling process to the state (European Commission 2016). According to the regulation if ship will be sent for recycling within the six months after its sale to new owner then penalties will be imposed on the last owner of the ship. The regulation encourage recycling facilities located in Indian Subcontinent to adopt safe practices of industry and continue their operations. It also discourages ship-owners to reflagged their ships just before recycling and same time encourage them to notify their intention of recycling of ships well in advance (Urano, 2012).

## 3.6 Summary

This chapter explained the main important international regulatory frameworks which control the ship recycling industry and covering the background, aims, key objectives, provisions and limitations of these instruments.

First, the perspective of ILO in ship breaking industry. The ILO recognised the industry as a hazardous occupation on the basis of low safety and health standards. Therefore, the ILO guidelines is a positive step to address this issue. There are many existing labour laws enforced, but the main concern for ILO is right implementation of laws and protection of workers. Therefore, ILO is working closely with all stakeholders of the industry to improve the conditions of workers.

Secondly, from the waste control perspective there is Basel Convection, which control the transferring of harmful waste from one location to another. The control measures are like ESM and PIC procedure are developed for waste management. The no prior

knowledge of ship owner's intention and identification of export state makes implementation of Basel Convention a difficult task. Whereas, the Hong Kong Convention is ensuring that the ship recycling activity should be safe for human and for environment. It is focusing more on the use of environmental sound and safe procedures in the recycling industry. The yard required to prepared SRFP and Ship specific SRP with the co-operation of ship owner. In this way the convention controls the activities of yards towards green practices. There are many challenges to Hong Kong Convention like no clear directives for Beaching methods, provisions of exemption to Naval ships, no clear directives for final disposal of waste material recovered from ship after scrapping.

# 4 PUBLIC AND PRIVATE FRAMEWORK IN INDIAN SHIP BREAKING INDUSTRY

In this chapter India's approach towards improvement of the ship recycling industry will be discussed. The formulation of new regulatory instruments will be discussed in this chapter.

## 4.1 Introduction

The "Beaching" is the most common method used in India for ship recycling and is widely criticised because of hazards associated with worker's health and the environment. The Indian Lawmakers have made tremendous efforts to control these hazards by regulating ship recycling activities. However, in 2013, India come up with a new regulatory instrument called the Ship Breaking Code 2013, which is designed to improve the working practices of the ship recycling industry (Poddar & Sood, 2015). The ship recycling industry has many advantages if it is regulated properly and efficiently. It provides useful metal in a sustainable way by reducing the pressure on the mining sector. It is the most environment friendly and economically cheap way of disposing the ships than other alternatives like mothballing process, where ship are preserved for the any future needs. It is generally used for naval ships and is very expensive (Bois, 2014).

## 4.2 Stakeholders Analysis

It is a methodology which is used to simplify organizational and policy reform. According to stakeholders' interest and influence to support or oppose the reforms we can decide how to develop co-operation between them (Alcaide et al., 2017). This section will try to explain the role of various stakeholders in the ship recycling industry and understand their contribution towards creating an environmentally sound and safe recycling industry. The success of any new project is depend upon the power and influence of people associated with it. It is easy to bring new changes if by getting positive support from these people. This analysis is useful to identify the people who

will support the implementation of new standards. These are the main stakeholders involves in Ship Recycling Industry of India -

### 4.2.1 Ship owners

The owner generally opts for one of the two methods for disposing of the vessel. Either he will sell the ship directly to the recycling yard or he will use the services of a cash buyer. The second procedure is most favourable among ship owners because here cash buyers are paying in advance to the ship owners and provide financial security to them. On other hand, selling directly to the yard on letter of credit is considered risky by ship owners (Engels, 2013).

### 4.2.2 Cash Buyers/ Ship brokers

The shipbrokers act as a middleman in the sale of ships for recycling. His knowledge of the ship recycling market situation and, ability to find potential buyers make him first choice of the ship-owners for disposing of his ship. The cash buyers generally opt for one of the two conditions when buying old ships, i.e. "As in where is" or "On Delivery". "As in where in" condition, the cash buyer takes over the ownership from the last port of call to ship recycling yard. In this case, he changes the flag and crew of the ship. In the case of "on delivery" the ship owner will take the ship directly to recycling yard as per the guidance of the cash buyer for best rate (Engels, 2013).

### 4.2.3 Ship Recycler

The ship recycler on basis of information the provided by ship brokers and ship owners calculates the price of the ship which directly depends upon type of scrap metal to be recovered from the ship. Apart from purchasing the ship the yard has to pay for other expenditures, for example taxes, rent, labour cost, duties, electricity, waste collection and disposable cost (Sarraf, 2010). Therefore, the revenue generated by the yards are dependent on operational cost and type of materials obtained from the ship.

### 4.2.4 NGOs, Environmental & Labour Rights

The NGOs have played a very important role in making the ship recycling industry environmentally sound and safe. It is because of tireless efforts of these NGOs that various new improvements have been introduced in the industry. These groups played

a very important role in creating awareness among the government and civil society about the recycling industry.

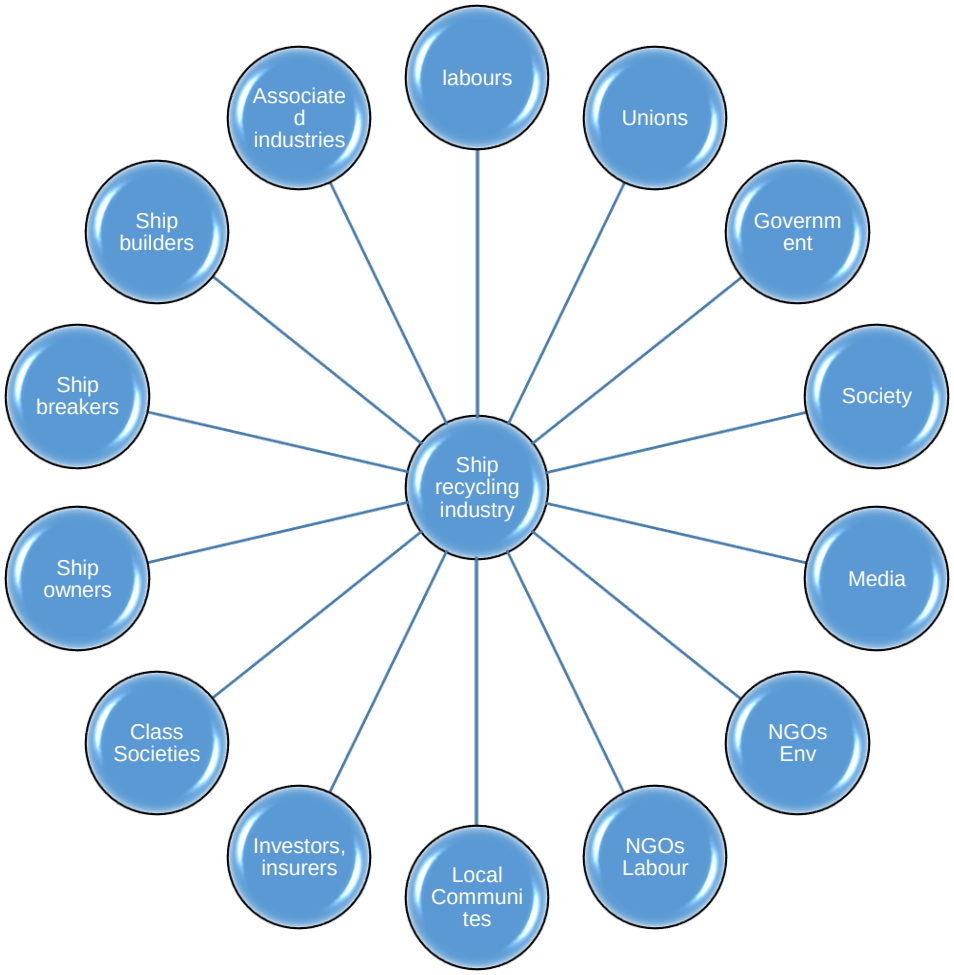
### 4.2.5 Associated Industries

The development of local markets for the by-products obtained from ship recycling is one of the important factors for a country to continue with this industry. The steel industry in India is a beneficiary of ship recycling. Similarly ship recycling is the biggest feeder of the second market, so any change in the operation of the industry will impact other associated industries (Lee, 2012).

### 4.2.6 Government and Administrative Agencies

It is the responsibility of government to regulate the industry under their jurisdiction. This can be done by introduction of new regulatory instruments and later implementation of these instruments. The correct enforcement of regulations is an important task of the government and this can be done by conducting regular inspections and audits.

**Figure 10: An overview of key ship recycling industry stockholders**




**Source:** (Joshi et al., 2004 & Hiremath et al., 2017)

### 4.2.7 Analysis of stakeholders relevant to ship recycling

All major stakeholder with their roles, their effect on the industry and industry's effect on them are placed in Table 5, and dimension of stakeholders are presented in Table 6. In order to visualise the ratings presented in Table 6, the web diagram is provided in Figure 11 and Figure 12. A systematic identification of stakeholders was made by discussion with people from Industry, Government, working groups and relevant organisations (Hiremath et al., 2017).

**Table 5: Stakeholder influence on Ship Recycling Industry**

| **Stakeholder** | **Roles** | **Stakeholder effect on Ship recycling industry** | **Ship recycling affects Stakeholder** |
|---|---|---|---|
| Ship-owners | Owner of the ship | Directly affect by price of selling the ship. The international nature of shipping provides ship-owners the possibility to choose the yards according to own criteria (e.g. Returns, reputation etc.) | Reputation, regulatory framework affects the prices and modified the competition between states. |
| Shipbrokers/ Cash buyers | Middlemen/ Facilitator for sale & identifying recycling yards | Directly affects by influencing market prices and competition | Only based in Indian sub confinement, indirectly change in regulation |
| Ship recycling facility owners | Organise recycling process and control the condition | Directly affects but under market practices | Directly affects by generating profits and reputation |
| Labours | Executes the ship breaking | Directly effect by labour cost and ability to organise and enhance industrial relationship to counterbalance yard owner power. | The worker's safety and health are affected by the working conditions and procedures inside yards. Their livelihood is affected because they are wage-dependent. |
| Government of India and its Administrative bodies | Supervision of activities located on its territory. So the control passes through development of regulation, | Can directly affect the industry by legislation, regulation, public investment, compliance | International and national reputation is directly affected by the industry conditions. |

| | | | |
|---|---|---|---|
| | strategy, local planning process, control and implementation and enforcement including inspection and sanction. | monitoring and enforcement | |
| International organisations particularly IMO, ILO, UNEP/ Intergovernmental Organisations such as EU/ Individual government (e.g. Japan) | Investigation of conditions in yards, Technical assistance/ funding to support international standards | Directly affects the industry by providing standards of reference for the Government, Private sector and NGOs | The condition in the yards affects the development of international policy and funding/ technical assistance |
| Trade unions/ NGO labours supporting occupational safety and health/ Human rights and social welfare | Supports welfare, social and human rights and working conditions of labours | Directly involve in promotion of enhanced working standards | The poor working condition, subcontracting system, use of short term of worker, use of migrants directly affects workers' rights |
| NGOs – Environment | Representation for environment protection | Indirect effect by lobbying for environment issues, directly affects the opinion of Government/ Judiciary/ Society | No big influence other than setting up of examples of good practices in environment protection |
| Subcontractors/ suppliers | Provide manpower, material to yard | Directly affects the working system and condition | Directly affected by yard decision to choose or not subcontractors and define its supplying process |
| Secondary Industries (Customers) | Provide business, cash flow to the yards and customers | Directly affects by providing local market for by-products of industry. | Directly affected by the industry market prices |

| | | | |
|---|---|---|---|
| Local Communities | Yard neighbours not directly involved in the process of ship breaking. But may be affected by ship breaking externalities | Affect industry indirectly by change in choice and directly if environmental concerns develop. | Provide positive externalities related to economic development of the area. |
| Class Societies | Set standards, service providers for shipping industry | Directly affect by introducing best practice in operation | The ship breaking industry affect the development of societies because of contracts with local yards or other stakeholder involved in the area. |
| Ship Builders | Construction of Ship | Indirectly effects from designing and construction point of view, use of hazardous material | Indirectly view restriction on the use of hazardous material in construction |
| Media | Highlight environmental and labour issues | Indirectly affect the yard operation and regulatory framework by highlighting environmental and social issues. | No influence till any incident takes place |

**Source:** Author's own interpretation

### 4.2.8 Explanation for ratings dimensions

A semi quantitative analysis of stakeholder's influences in the industry was developed. in order to do so certain criteria were defined:

1. Power – The power of stakeholder will be based on the following factors:
   - Its ability to disrupt the activity
   - It can bring the uncertainty in the future of activity.

This factor is used to determine the power various stakeholders have in formulation of a new regulatory framework for an environmentally sound and safe ship recycling industry (Bryson, 2007).

2. Importance – The importance of stakeholders is depending upon their ability to affect major changes in the industry. This importance is depending upon economic, social and political weightage of a particular stakeholder. This is a key factor for deciding the future engagement. This factor is used to determine how various stakeholders are important when introducing green regulatory instruments.

3. Support – This factor is used to check which stakeholder is supporting the introduction of new regulatory frameworks more to improve the industry and at the same time identify whose support will play a major role in bringing new changes.

4. Interest – All stakeholders have different motives and expectations from an activity. Therefore, this factor is used to determine the expectations of different stakeholders when introducing new regulatory instruments to improve the conditions of industry.

5. Influence – Influence is the capacity of a stakeholder to effect the future development of the industry. Some stakeholders play very important role in introducing environmentally sound and safe practices in the ship recycling industry (Bryson, 2007).

**Table 6: Stakeholders rating in the Ship Recycling Industry**

| **Stakeholders** | **Power** | **Importance** | **Support** | **Interest** | **Influence** |
|---|---|---|---|---|---|
| Ship-owners | 8 | 8 | Neutral | High | High |
| Shipbrokers | 9 | 9 | Neutral | High | High |
| Ship recyclers | 8 | 8 | Neutral | High | High |
| Labours | 4 | 8 | Positive | High | Unlikely |
| Government | 9 | 9 | Positive | High | High |
| Int. Organisations | 9 | 8 | Positive | High | High |
| Trade unions | 7 | 6 | Positive | High | Unlikely |

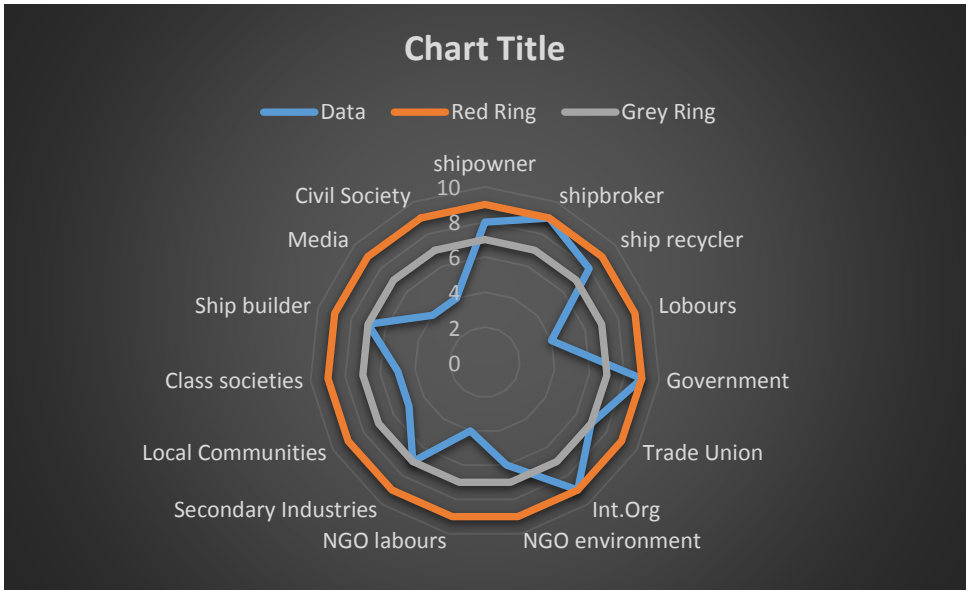
| | | | | | |
|---|---|---|---|---|---|
| NGOs – Environment | 6 | 6 | Positive | High | High |
| NGOs – Labours | 4 | 4 | Positive | High | Low |
| Secondary Industries | 7 | 4 | Neutral | High | High |
| Local Communities | 5 | 6 | Positive | Unlikely | Low |
| Class Societies | 5 | 4 | Positive | Unlikely | Low |
| Ship Builders | 7 | 4 | Positive | Low | Low |
| Media | 4 | 6 | Neutral | Low | Low |
| Civil Society | 4 | 4 | Neutral | Low | Unlikely |

Note: Marking 0 – low and 10 – high

**Source:** Author's own interpretation

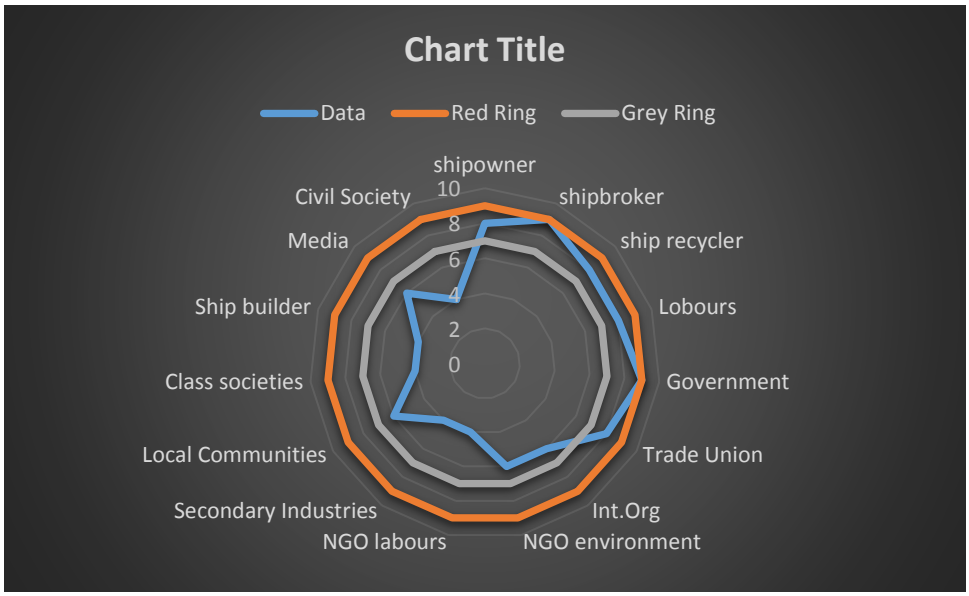
According to Table 6, some stakeholders play a very important role in the introduction of new regulatory instruments to improve the conditions of the recycling industry in India.

**Figure 11: Stakeholder ratings for "Power" in Ship recycling**




**Source**: Authors' own production and data obtained from Table 6 para 4.2.3

**Figure 12: Stakeholder ratings for "Importance" in Ship recycling**




**Source**: Authors' own production and data obtained from Table 6 para 4.2.3

## 4.3 Origins of Present Regulations in India

A detail analysis of the legal framework regulating the ship recycling industry will help in order to understand the main reasons behind mismanagement of this industry. In addition to international conventions, domestic regulations and cases will be analysed in the following. Initially the industry was regulated by various generic environmental and labour laws.

### 4.3.1 Clemenceau Case

The concerns about the conditions of the ship recycling industry in India was first raised when in 2006 a decommissioned French Navy Aircraft Carrier "Clemenceau" arrived Alang for dismantling. The vessel was alleged to contains 500 or more tons of asbestos, tons of PCBs. This was later confirmed by Greenpeace who was leading the campaign against its dismantling in India (Orellana, 2006). The matter was brought forward to the Supreme Court of India, which in turn constituted a committee of technical experts to assess the hazards posed by the vessel and denied the vessel permission to enter India. In 2003, the Supreme Court of India had addressed the Basel

Convention, regarding hazardous waste and ship recycling activities. It clearly states that the ship before entering into the port should provide complete details of any hazardous waste or radioactive materials present on-board. The owner should ensure that the ship is decontaminated of all hazardous substance. The court also established the Hazardous Waste Monitoring Committee, in order to monitor the provision of the Basel Convention[1]. The Court expressed concerns over the environmental damage caused by the shipbreaking industry and laid down guidelines for promoting safe ship-recycling[2].

### 4.3.2 Blue Lady Case

The Blue Lady was a French passenger ship built in the 1960s, the vessel has changed many hand before reaching Alang. The vessel contained 1,240 tonnes of asbestos in the structure and tonnes of PCBs (Jain, 2007). In 2007, this matter came before the Supreme Court of India[3]. This case gave chance for Indian Jurisprudence on the ships scrapping. The Supreme Court successfully identified that the polluter pays concept was the integral part of Indian Environmental Law, but this concept lost its credibility when the Court allowed the dismantling of the ship at Alang[4].

The Court further justified that the damage to the environment caused by dismantling the ship would be recovered in a sustainable way due to the economic opportunities it would generate. It was projected that dismantling of the vessel would provide 700 new jobs and 41,000 tonnes of steel[5]. The decision was looked upon as a short term gain case against long term implications.

Further, the Court took a historical step by ordering the Government to prepare a comprehensive regulatory instrument for governing the ship recycling industry[6]. On

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[1] Research Foundation for Science, Technology and Natural Resource Policy v. Union of India, WP (C) No. 657 of 1995, order dated 17-2-2006.

[2] Research Foundation for Science, Technology and Natural Resource Policy v. Union of India, WP (C) No. 657 of 1995, order dated 14-10-2003[3] Research Foundation for Science, Technology and Natural Resource Policy v. Union of India, (2007) 15 SCC 193.

[4] Research Foundation for Science, Technology and Natural Resource Policy v. Union of India, (2007) 15 SCC 193,

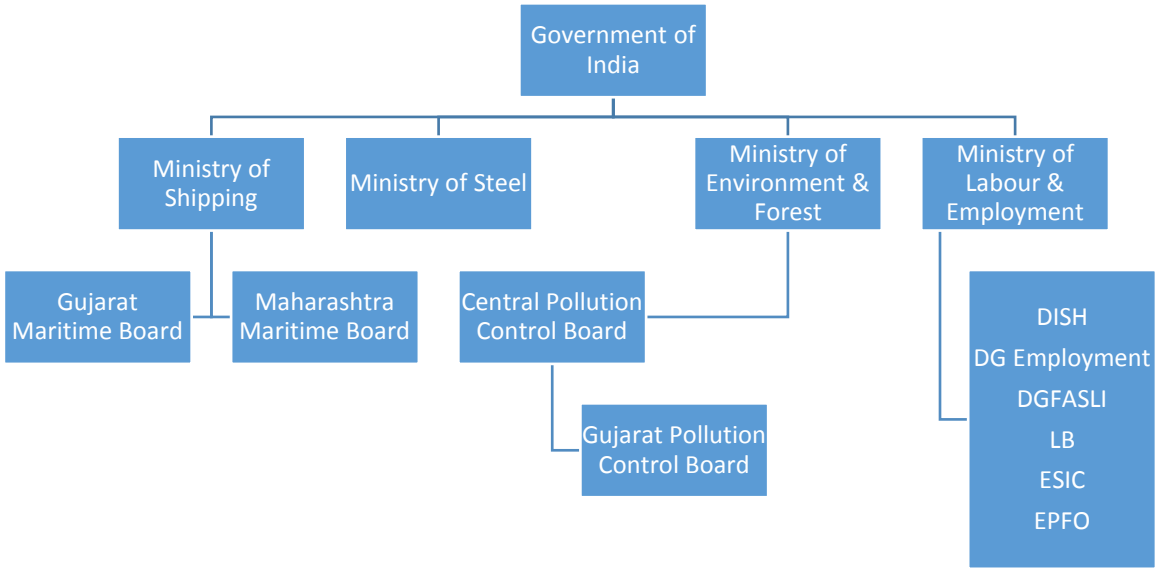
[5] T.N. Godavarman Thirumalpad v. Union of India, (2002) 10 SCC 606,

the basis of these directions, the Government formulated a new ship breaking code 2013. The development of this Code is a clear proof of that old regulatory instruments had failed to address the actual problem. Therefore, policy makers felt the need for new instrument in line with international standards for safe recycling of the ships. The awareness in civil society also played a key role in the development of these instruments.

### 4.4 Present Framework of Institutions and Instruments in India

Various ministries, departments of central and state governments are controlling the different aspects of the industry in India.

**Figure 13: Different Stakeholders of the Government in the Shipbreaking Industry**




**Source:** (Ministry of Shipping, 2017 & Ministry of Labour & Employment, 2017)

[6] Research Foundation for Science, Technology and Natural Resource Policy v. Union of India, (2007) 15 SCC 193)

## 4.5 Indian Shipbreaking Code 2013

As discussed earlier, there are many existing laws which are governing the ship recycling industry in India, but an industry specific dedicated instruments to address the issues will be discussed. To strengthen the safety provisions for workers and protection of the environment the Ministry of Steel came up with a new code in 2013. The code is directly inspired and structured around the Hong Kong Convention, 2009. Three out of eight chapters are dedicated to the occupational safety health aspects of workers. It is design to reduce the multi-agency certification process, by promoting co-ordination between various authorities.

### 4.5.1 Approval Process for Ships and SRFs – Inspection and Control

The code divided the beaching process under two broad stages – anchoring (chapter III) and beaching (chapter IV). From inspections and a control point of view the recycling process is divided into four parts.

- Pre-arrival of ship
- Arrival of ship in Indian water
- Recycling process
- Completion of dismantling operations

4.5.1.1 Pre-assessment of the Ship before Beaching (Arrival and Anchoring)

The first round of clearance starts when the ship-owner seeks permission for the ship to enter into the Indian waters. According to article 3.3.1 of Shipbreaking Code, 2013, the ship-owner has to inform the SMB/ PA before sending the ship for the recycling yard. The owner has to intimate ETA of the ship and submit all the information according to Annexure-I of Code to SMB three weeks before the arrival of the ship (SBC,2013, Article 3.2.2). Once the vessel has arrived at the port, it is allowed to anchor in the port area and then the second round of clearances starts.

4.5.1.2 Pre-beaching Process

The procedure for pre-beaching process are as follows:

- Inspection by Custom Department
- Desk Review by GPCB, AERB, Surveyor for IHM part II and GMB.

For beaching certain documents need to be submitted by the recycler and the important one is the ship recycling plan (SBC, 2013 article 4.1.1). The anchorage vessel is boarded and inspected by the Customs, PESO for Oil/Chemical tankers, AERB, IN for Naval ships and SPCB for large passenger ships of more than 2000 LDT (SBC, 2013 article 4.1.2).

The recycler is required to obtain gas free and fit certificate from the competent authority before beaching {Factories Act, 1948 section 2(ca)}. Once physical verification and required certification is completed the vessel will be issued with final permission of beaching by SMB. The permission will be given in the two working days once all clearances obtained from the departments concerned. If the permission is denied, the ship-owner is entitled to review of his request (SBC, 2013 Article 4.1.4). Once a vessel get clearance for beaching it is embarked by the Beaching Captain, who will navigate the ship for her final journey to the allotted plot with the help of a yard pilot giving direction from the shore. When the ship is properly beached, the ship breaking will start in an approved ship recycling facility.

4.5.1.3 After Beaching Process

- GMB inspection prior to oil removal
- GPCB inspection during oil removal
- GPCB inspection for decontamination certificate
- GMB inspection for safe entry gas free/ hot entrance control
- Cutting permission by GMB

The GMB authorised entire process and it took 2 to 5 weeks before starting of cutting operations.

4.5.1.4 Cutting Operations

- GPCM and GMB inspection
- Director of Industrial Safety, Training and Health (DISH) inspection
- Inspection by Labour Inspector for workers' wages and Labour law.
- Inspection by Employees State Insurance Scheme (ESIC) inspector
- Inspection by Provident Fund Inspector

4.5.1.5 Closing of Process

- Final Inspection by GMB
- Certification of completion of job by GMB

### 4.5.2 Ship Recycling Plan

According to the Code the recycler has to prepare and submit a plan to obtain permission to bring the ship for recycling. This plan is focused on two important components of the recycling process the recycling facility and the ship. The recycler has to submit the SRFMP and the SSRP to the authorities. In order to get approval of the SRFMP, the yard must possess requisite documents and facilities. This includes authorization for handling hazardous waste, license of storage of LPG Cylinders (Gas Cylinder Rules 2016), License of Plot, Map showing Layout of Yard, Provisions of Shelter/ Rest/ Lunch room and Canteen (Factories Act 1948, Section 46 and 47), Provision of adequate lighting (FA 1948, Section 17), Clean Drinking Water (FA 1948, Section 18), Latrines and urinals (FA 1948, Section 19), Washing Facility (Section 42) and First Aid (Section 45), the list of trained First Aiders and fire fighters on notice board. The plan should have provisions for storage warehouse for hazardous waste, temporary asbestos storage facility, warehouse for LPG cylinders and PPEs of the Bureau of Indian standard {SBC, 2013 Article 5.2.1(i)}. This approval is valid for five years and subjected to review every six months. If any corrective measure arises during these reviews, it has to be addressed immediately by the yard owner (Article 5.2.2). After the SRFMP is approved, the yard owner is required to submit the SSRP to the authorities. This plan should contain details about the ship, ship breaking schedule, work procedures, status of material handling equipment, status of PPEs, decontamination certificate from SPCB as well as, gas free and fit for hot work certificate (Article 5.3).

The authorities have power to deny permission for entry or beaching to a vessel that is not fulfilling the requirements of the Code (Article 3.3.3 & Article 4.1.1). The Code also empowers the authorities to impose penalty, including cancellation of license of

recycling yard if there is any violation of provision found during inspection of their facility (Article 4.2.5)

### 4.5.3 OSH and Welfare of Workers

The Code ensures that basic facilities for better employment conditions should be made available by yards. The recycler has to submit an undertaking to SMB that the SHE management aspects will be compiled and observed. The availability of PPEs, open space, rest rooms, firefighting provisions, drinking water and hygiene conditions are some of the areas addressed strongly in the Code. The workers should be provided proper training before delegation of work in the facility. The training should be sufficient in terms of duration and given in the language understood by them. The special mention of hazards associated with the job should be included in the curriculum (Article 6.3.1). The provisions of the Factories Act, 1948 have been strongly included in the Code, such as an attendance register for workers, photo ID cards, provision of BIS standard PPEs for all workers, appointment of safety supervisor with requisite qualification, regular calibration and maintenance of flammable and toxic gas detectors. The handling of hazardous waste material like asbestos should be carried out by trained workers {Article 6.3.2 (vi)}. In order to improve working environment and standards of work place the recycling facility has to establish a suitable housekeeping programme. This involves removal of scrap, debris and waste at regular interval (Article 7.11). According to the Code the workers are allowed to enter into confined spaces only with adequate breathing apparatus, first aid kit and trained attendant. No naked light and hot work are permitted unless it has been declared free from flammable gases (Article 7.15). The ship recyclers have to take all precautions against the fall of workers and materials by putting appropriate fence, barriers, lookout men, guard rails, safety nets and safety harnesses (Article 7.13). The recycling facility should use more signs and symbols as a mean of warning against dangers. This will help workers to identify the hazards clearly (Article 7.16). The code regulates the terms of employment for workers by using various existing labour acts and regulations. The work timing, maximum weekly hours, daily hours of duty and holidays are regulated

as per the Factories Act 1948 (Article 6.1.5). The Code ensures that workers should get minimum wages according to existing legislations. The recycler has to provide compensation and re-employment to those workers who suffered asbestosis cancer and loss of limbs in accidents respectively (Article 6.12.2).

### 4.5.4 Management of OSH

The Code puts more emphasis on improvement of OSH conditions in the ship recycling industry. In order to raise the working condition standards, the recycling facility should implement an OSH management systems depending upon the nature of the activities it is carrying out. This system should have a OSH policy and a responsibility and accountability mechanism (Article 7.1.1). This policy ensures that OSH should be an important part of management. The management should be committed towards OSH programmes by fulfilling the requirement of relevant OSH laws and regulations enforced. The main objective of the OSH system is to injuries and diseases attributable to working conditions. This can be achieved by making emergency prevention, preparedness and response arrangements.

4.5.4.1 Employees Provident Fund

This scheme is under the Ministry of Labour and Employment. It is like a pension scheme for workers where they can withdraw money for house building and higher education (Employees' Provident Fund Organisation India, 2017).

4.5.4.2 Employees State Insurance (ESI)

All workers are covered by the Employees State Insurance scheme. This is a self-financing health insurance scheme. (E.S.I.C, 2017). The ESIC covers accidental and medical treatment cost of all insured workers (see Appendix**Error! Reference source not found.**).

### 4.5.5 Protection and Preservation of the Environment

The Code ensured that ship recyclers should strictly ensure environmental protection measures under the Hazardous Wastes Rules 2008, Water Act 1974, Air Act 1981, Environment (Protection) Act, 1986, EIA 2006 and CRZ Rules-1991 notifications

(Article 6.4.1). The regular monitoring of air, soil, sediment and marine water quality within 10 km radius of facility should be conducted by SPCB. The SMB should carry out independent monitoring of the same by CSIR labs (Article 6.4.3). The reception facility should be set by SMB at the yard on a cost recovery basis for disposal of sediments and oily sediments (Article 6.5). The waste generated by ship recycling activity should be segregated properly. Waste oil sludge should be removed and sent outside of the beach area for disposal. The waste product recovered from the ship should not be directly dumped into the sea. (Article 6.6.1). The ship recycler has to inform the Coast Guard about any incident of oil spill and make a necessary report according to National Oil Spill Disaster Contingency Plan (NOSDCP).

### 4.5.6 Solid and Hazardous Waste Management

Most of the recycling yards are have temporary storage facilities of hazardous and non-hazardous waste. All yards are members of a centralized Hazardous Waste Treatment, Storage and Disposal Facilities (TSDF) under GMB (Gujarat Maritime Board, 2017). On behalf of GMB, Gujarat Environment Protection & Infrastructure Ltd (GEPIL) operates and maintains these treatment facilities. The GEPIL also provides expert advisory services to buyers and sellers of the ships going for recycling. It provides the detailed assessment of hazardous wastes present in the ship. Safe removal of ACB from ships. Maintaining the secured dedicated landfill for asbestos, glass wool and PCB are some of the major tasks of GEPIL. A list of hazardous materials handled by GEPIL at GMB TSDF is enclosed (see Appendix**Error! Reference source not found.**)

## 4.6 Development of private standards to control ship breaking activities – Shipping Companies and Classification Societies

It is the general perception that implementation of regulations and control mechanism is the responsibility of Government. But some time due to involvement of large number of Governmental agencies the final implementation becomes ineffective.

Therefore, development of private standards is one of the commendable step towards the improvement of industry without waiting for government to react.

### 4.6.1 Efforts by Maersk towards development of Responsible Ship Recycling Standards

Many big shipping companies have come forward to improve the conditions of the ship recycling industry. Maersk has come up with its own responsible ship recycling standards (RSRS) because of its ethical, social and legal responsibility. These standards are applicable to Maersk ships regardless of any method used for recycling. The main aim of RSRS is to evaluate the standards of SRF according to the national/ international/ industry standards (Maersk, 2016).

#### 4.6.1.1 Objectives of RSRS

To provide more opportunities to SRF management to improve the standards gradually with the help of a suitable mechanism. HKC compliance is the basic threshold of this mechanism. This will be supported by strong management commitment. The HKC compliance, worker rights, corruption and human rights have to be audited by qualified auditors. The area of improvement can be identified, the improvement plan need to be accepted by both SRF and the ship owner, with well-defined actions and timelines addressing critical requirements, major and minor requirements. Once this improvement plan is accepted by both parties, Maersk ships can go to these SRF for recycling. The improvement plan is liable for on-site supervision and follow up audits.

#### 4.6.1.2 Health & Safety, Labour and Human Rights

The SRF has to provide a complete detailed description of plans for ensuring workers health and safety. To maximise worker safety a proper job hazard assessment has to be conducted by SRF and these assessments need to be supervised. A qualified person has to determine safe-for-entry conditions by checking the oxygen content, presence of flammable gases, toxic and irritant gases by using of certified and calibrated equipment (RSRS, B7 & SBC, 2013). The proper load testing of rigging equipment, hooks and chains need to be done on regular interval. The good quality PPEs has to be provided to all workers for protection from various risks and hazards. A robust

emergency preparedness and response plan (ERPS) has to established by the SRF. The workers should be provided with formal employment agreement in the local language, and it should contain all provisions of local labour law (RSRS F6, ILO C95).

#### 4.6.1.3 Environment compliance approach

The RSRS ensures that the SRF has to address the environmental risks associated with ship recycling. The information in the IHM has to utilise by SRF for identifying the location, type and quantity of hazardous materials held on-board ship. Once identified these materials need to be removed in a safe manner. Further it need to be kept in a separate storage temporarily or for long term. These materials should be transferred only to authorised facilities capable of handling them {MEPC 210 (63) & SBC 2013}. The SRF has to make special arrangement for spill prevention, control and countermeasures. The SRF should develop a programme that defines various measure to reduce debris deposition in the environment (RSRS C20 & SBC 2013).

#### 4.6.1.4 Anti-corruption

According to RSRS, the SRF should have a written internal policy on anti-corruption and business ethics. This policy should prohibit bribery, extortion and corruption both by government and private official (RSRS, D2 & UNCAC, 2004).

#### 4.6.1.5 Subcontractors

The SRF should have a screening and monitoring policy for all its subcontractors and suppliers. This policy should be aimed at their commitment towards best practice of health and safety, labour rights, human rights, anti-corruption measures and protection of environment. (RSRS, E4 & UNGC principles, 2016).

### 4.6.2 Efforts by Classification Societies

Classification Societies use IMO guidelines for IHM related services. The following classification societies are providing IHM related services –

- Det Norke Veritas – Germanischer Lloyed (DNV-GL)

- Nippon Kaiji Kyokai (ClassNK)
- Lloyds Register of Shipping (LR)

All classification society will provide the IHM statement of compliance in place of the Green Passport. On implementation of the EU regulation or the HKC. The classification societies are providing necessary guidance to shipyards and ship-owners about Supplier's Declaration of Conformity (SDoC) and Material Declarations (MD).

#### 4.6.2.1 Inventory of Hazardous Material

The objective of Inventory of Hazardous Material (IHM) is to provide information about hazardous materials present on board ships. This information is useful in order to protect health and safety of crew and workers at ship breaking yards.

#### 4.6.2.2 Efforts by ClassNK

To reduce paper work, the ClassNK has developed "PrimeShip-GREEN/ SRM" to develop IHM by using the Cloud Computing System in cooperation with IBM. The subsidiary of ClassNK "ClassNK Consulting Service" provides expert assistance to ship-owners in development of IHM. To fulfil the requirements of HKC, ClassNK provides the Statement of Fact (SOF) which will act as an International Certificate on IHM once HKC will enter into force. To avoid last minute rush, ClassNK recommends early preparation of the IHM for all ships (Chris van Hooren, 2015).

#### 4.6.2.3 IHM Services by DNV-GL

In the case for new ships there should be a proper identification of the component and equipment supplier. Then obtain the SDoC and MD from these suppliers. Collect and organise the SDoC and MD accordingly. Prepare Part I of IHM and send it for certification by a recognised organisation.

In the case of existing ships, the first step is collection and assessment of necessary information. Then preparation of visual/ sampling check plan, conduct on board physical visual/ sampling check, preparation of part I of IHM, initial survey and issuance of certificate will be carried out.

For management of hazardous materials on board, the society has developed a ship specific integrated and sustainable Hazmat management programme for the full life cycle of ships. The DNV-GL maritime advisory service provides MD consulting for shipyards and suppliers and DNV-GL maritime academy conducts specific training courses. At the same time, society has developed a web based software application for developing and updating IHM called IHM Green Server (Chris van Hooren, 2015).

#### 4.6.2.4 IHM services by Lloyds Register of Shipping

For new ships, during construction the LR team will inspect and audit whether the shipyard is implementing the required standards for use of hazardous materials. The contract between LR and the owner of the new ship is called 'Request for first Entry'. To control subcontractors, the IMO guidelines utilise 'Material Declarations' (MD) concept. The LR provides letter on the basis of that the shipyard can project its requirements to the subcontractors (LR Document Guide to the IHM 2014-01, para 2.3.1) (Lloyd's Register Marine, 2014).

For existing ships, the IHM and Visual/ Sampling Check Plan (Guide to IHM 2014-01, Chapter 3) will be prepare by the ship-owner. The inventory and completeness of documentation will be reviewed by the LR approval team. It will check the hazards expected for the ships of the same age and type. After detailed survey the Approval Team will issue an IHM SoC to the ship (LR Document Guide to the IHM 2014-01, para 2.3.2) (Lloyd's Register Marine, 2014).

According to HKC, the IHM need to be maintain throughout the life of the ship, with renewal survey intervals in every five years. In LR class vessels the IHM is reviewed every year during annual class surveys. No annual review for non-LR class vessels. But a survey can be done on the request of the ship-owner after any major change in ships repair (LR Document Guide to the IHM 2014-01, para 2.4) (Lloyd's Register Marine, 2014).

4.6.2.5 HKC, 2009 Certificate of compliance to the Yards

Class NK (Japan) has already certified four yards in Alang-Sosiya and four additional yards are in the process of upgrading towards HKC, 2009 compliance. The HKC certification of compliance process undertaken by Class NK has been emulated by another classification society (RINA, Italy). RINA has certified one yard (Plot 5 – Shubh Arya Steel) and has announced that nine additional yards could apply for RINA certification (Recycling Today, 2016). Both classification societies intend to limit the amount of yard certification respectively to 8 for ClassNK and 10 yards for RINA with the aim at monitoring how these yards can hold and keep improving over time (Chris van Hooren, 2015).

## 4.7 Conclusion

This chapter mainly focused on India's approach and efforts towards improving the condition of her ship recycling industry. The involvement of stakeholders is very important before taking new initiatives in the industry. Therefore, a detailed stakeholder's analysis helps to understand who are the major players in the industry and their interest and influence towards introduction of new standards and practices. The present regulatory framework in India is due to long and continuous efforts of various NGOs, government agencies and judiciary. The cases of Clemenceau and Blue Lady are the land marks, which forced the regulators to act and this results in the introduction of new Indian Shipbreaking Code. The Code is based on the principles of HKC and found its origin in it. It is an effort towards improving the condition of the environment and workers. The Code covers the entire ship breaking process step by step and provide guidelines for all stakeholders involved. It has addressed the OSH of workers and recommended various measures to improve working conditions. The Code provides guidelines for environmental protection and preservation. There is a positive initiative by the shipping companies towards development of responsible ship recycling standards. This initiative is a positive step to control the recycling industry by introducing private standards. This is clear reflection of various shipping companies towards their endeavour for environmental protection and safety of workers.

# 5 Challenges and Recommendations

## 5.1 Challenges to the Ship Breaking Code

The Code is drafted to streamline the ship recycling activity from environmental protection and labour welfare point of view. But there are many challenges which is associated with Code. The biggest challenge is implementation of Code. Due to presence of multi-agency involvement in actual implementation, sometime this situation leads to laxity in the attitude of agencies.

## 5.2 Environment Based Challenges

The foundation of the Ship Breaking Code was laid down in 2007, by the Supreme Court's orders during the cases of Clemenceau and Blue Lady. In 2007, while answering to a written petition the Supreme Court did not accept the suggestion that the ship need to have total decontamination before leaving the home port[1]. However, in another order from the same petition, it said that authorities in India have to follow the norms of the Basel Convention[2]. The interpretation of this order was that no ship should be allowed in Indian waters without proper decontamination in its home country. The Basel Convention required the transboundary movement of hazardous waste should be reduced from place of origin to place of dumping {(Basel Convention Article 4(2) d, Article. 4(2) e and Article 2(9) a}. To achieve this standard all ships destined to India for recycling are required to be pre-cleaned in the home port. However, the Code is silent on this issue, there is no provision of submission of decontamination certificate from the home country. It only requires the ship recycler to remove all hazardous substances from the vessel once the vessel is anchored in Indian waters and waiting for beaching permission (SBC, 2013, Article 4.3).

[1] Research Foundation for Science, Technology and Natural Resource Policy v. Union of India, (2007) 15 SCC 193

[2] Research Foundation for Science, Technology and Natural Resource Policy v. Union of India, WP (C) No. 657 of 1995, order dated 30-7-2012)

Here again the problem of disposing of this harmful substance arises because now the ship is already in Indian waters. It is therefore suggested that the Code should include provision for pre-cleaning of ships for obtaining anchoring permission.

## 5.3 Worker's Welfare based challenges

Welfare of workers is the need of the hour. For sustainable development of industry and society it is important to address the grievance of worker and need to work towards the improvement of their condition.

### 5.3.1 Application of important labour laws

The ship recycling yards in Alang employ approximately 40,000 unorganised migrant workers. These workers have migrated from the various regions of the country for job opportunities. The Code has used various provisions of The Factories Act, 1948 for the ship breaking industry. According to The Factories Act, 1948, a factory is defined as a premises where ten or more workers are working if the manufacturing process is carried out with the aid of power, or whereon twenty or more workers are working if the manufacturing process is carried out without the aid of power.

The Code has not obliged the yard to maintain any numerical requirement of workers. Although a large number of migrant workers are involved in the industry, the Code is silent on other significant labour welfare legislations, like the Inter-State Migrant Workmen (Regulation of Employment and Conditions of Service) Act, 1979 ('Inter-State Migrant Workmen Act') and The Trade Unions Act, 1926 ('Trade Unions Act') (Jain et al., 2013). The application of all these legislations is difficult if they are not included in the scope of Shipbreaking Code. The main problem is circumventing these rules by yard owners, to satisfy the definitional requirements of legislations. In order to save themselves from the provisions of labour laws, these yard owners outsource the work to contractors. These contractors then hire workers freely available near the yards for jobs on a daily wage basis. The hiring of these workers depends upon availability of ships and the nature of jobs to be assigned. At any particular point a yard employs approximately 250 to 300 workers per daily basis. These workers are kept on shifting from one yard to another yard by contractors depending upon when

the jobs arise. It is very difficult for workers to ask for their rights under existing legislations. The main reason for this is absence of a contract of employment and temporary job specific hiring (Sahu, 2014). The Inter-State Migrant Workmen (Regulation of Employment and Conditions of Service) Act, 1979 provides significant rights to migrant workers because they often work away from their home in an alien environment. The code should include the following provisions such as no employment of migrant worker without registration (ISMW Act 1979, Article 6), the contractor should have mandatory license for hiring and employment of these workers (ISMW Act 1979, Article 8), contractors should provide passbooks to all workers with details of employment period, daily wage rates (ISMW Act 1979, Article 12). It is the responsibility of the contractor to provide displacement allowance, journey allowance, payment by the contractor and failure of payment by principal employer (ISMW Act 1979, Article 14 and 15). The main problem of migrant workers is job security; they are very vulnerable to termination of jobs by yard owners. The Trade Unions are not strong enough in representing the workers' rights for instance working conditions, low wages, leave, medical care, compensations and delay in wages (NGO Shipbreaking Platform, 2014). The provision of the Trade Union Act, 1926 should be included into the Code for improving condition of trade union representation.

### 5.3.2 Prohibition of child labour

The Article 24 of the Indian Constitution prohibits the employment of children below the age of 14 in hazardous places of work. The Child Labour (Prohibition and Regulation) Amendment Act, 2016 clearly prohibits the engagement of children (under 14 years) and adolescents (under 18 years) in hazardous occupations. Moreover, the Code also identifies the ship breaking industry as a hazardous process, but still there is a great deal of evidences of child labour in the industry. Due to the large number of adolescents in the ship recycling industry, the Code should have included its own definition of child labour and regulate the industry without waiting for a national legislation to address the problem (Menon, 2014).

## 5.4 Difficulties in Implementation and Enforcement

The success of any regulatory instrument is depend upon its implementation. It effectiveness is measure in terms of improvement of the activity it is addressing. In following subsequent paragraphs, we will discuss the difficulties faced by the Code in terms of implementation and enforcement.

### 5.4.1 Inspections Regime in Code

The Code ensures that enforcement of its provisions should be conducted properly and thoroughly. It empowered two main bodies for doing this job and divided the task accordingly. The responsibility of regular inspection is given to the Director of Industrial Safety and Health (DISH) and in case of non-compliance of the provisions of the Factories Act 1948, it can initiate legal action against the defaulters by issuing of show cause notice/ warning/ order as per the provisions of Factories Act 1948. A copy of the notice/ warning/ order should be provided to SMB/ PA (SBC, 2013 Article 4.2.2 (e) and Article 6.1.7). The responsibility of overall supervision of ship breaking activities is given to SMB/ PA (SBC, 2013 Article 6.10.1). The ship recyclers will be liable to fines and cancellation of the license of yard in the case of non-compliance of provisions of the Code found during inspections by the agencies concerned (SBC, 2013 Article 4.2.5). It has been observed that in spite of having such strict inspection regime very few yard owners booked for non-compliance discovered during inspections.

### 5.4.2 Inspection Regime for Workers

The Director, Industrial Safety and Health, Gujarat State is the main body which is looking after the inspection regime for the factory wing in the state. The DISH looks after and ensures the implementation of the following regulatory instruments.

- The Factories Act 1948 and Gujarat Factories Rules, 1963
- The Environment Protection Act, 1986
- The Manufacture, Storage and Import of Hazardous Chemical Rules, 1989
- Chemical Accidents (Emergency Planning, Preparedness & Response) Rules, 1996

- The Payment of Wages Act, 1936 and Rules there under (Figure 14).

- The Maternity Benefit Act, 1961 and Rules there under- The Gujarat Physically

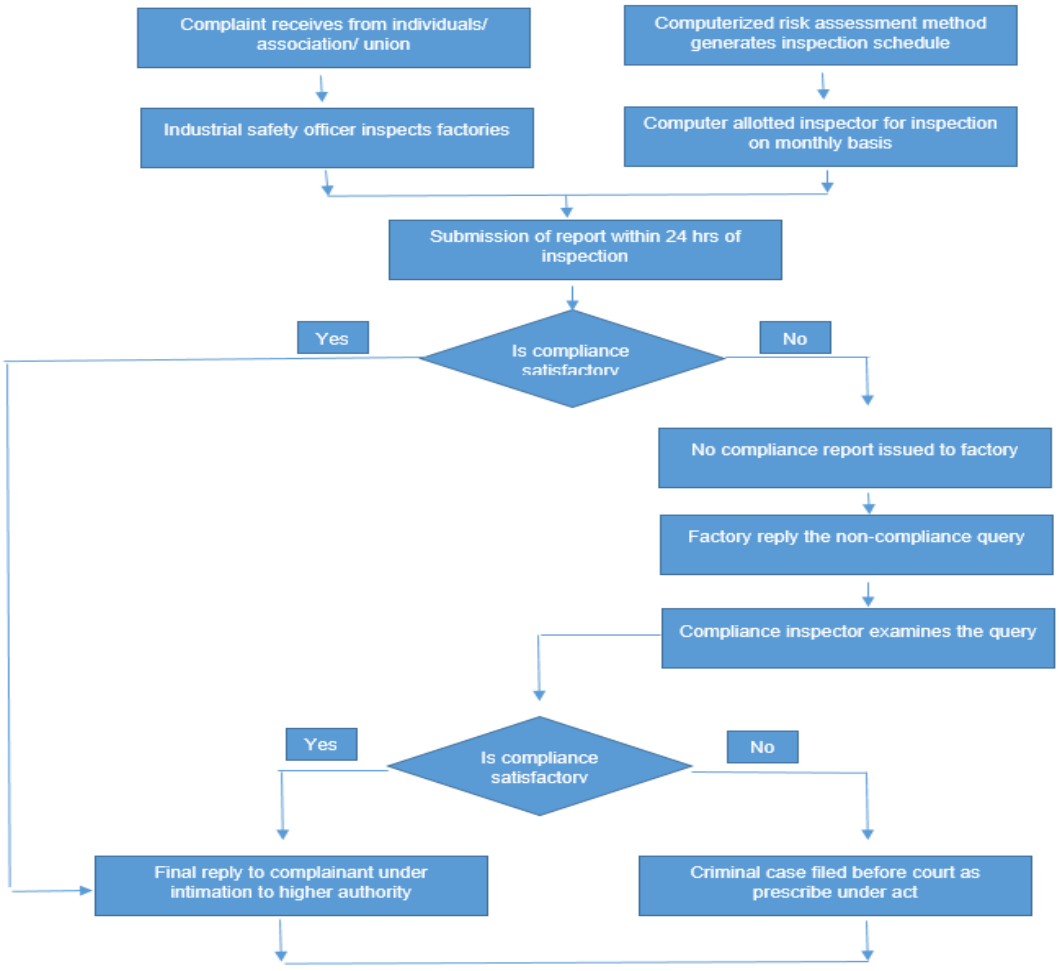
- Handicapped Persons (Employment in Factories) Act, 1982

- The Gujarat Payment of Unemployment Allowance to Workmen (in factories) Act, 1981

- The Building and other Construction Workers (Regulation of Employment and Conditions of Service) Act, 1996

The detail procedure of inspection for complaint against discrepancies of wages under the Payment of Wages Act, 1936 is explain in figure 14.

**Figure 14: Compliance Inspection under the Payment of Wages Act, 1936**




**Source –** (DISH, 2016)

### 5.4.3 Inspection Regime for Environment

Indian legislation gives adequate provision for protection of the environment and the same is applicable when it comes to the ship recycling industry. However, violations still do takes place at large scale. There is a big gap between promulgating and ground enforcing of law. The main reasons of this situation are as follows:

- Understanding of environmental laws is very limited in society. Most of the time local people are both polluters and victims of pollution. They are not aware of the consequences of their activities.
- The ship recycling yards are working for short term gains, without paying much attention to long term impact and wellbeing of future generations.
- The Government always claims that environmental protection is top priority, but when comparison between economic and environment benefits develops, environmental issues take the back seat.
- The implementation of law is difficult because of low fines and no regular follow up for restoring of any deficiency observed during inspection. This lack of follow up leads to repeated breaching of law. The companies find is easy to pay fines than investing in modern hazardous material storage management plant.
- Unemployment rates sometimes force society to overlook the damages caused by industry to the environment.

## 5.5 Recommendations

- There is need for more in-depth initiative by India for development of the ship recycling industry according to international standards. Equal importance should be given to waste reception, handling and disposable facilities.

- All stakeholders should come forward and establish an open channel of discussion. This will provide correct feedback to the Government and it will be easy for it to develop new guidelines and policies based on these feedbacks.

- It has been notice due to tough competition, lack of capital investment and very low profit margins, the yard owners in India avoid introduction of technology and safety measures. Therefore, Government should invest in capacity building of these small yards. Same time the industry should opt for merger of small entities into the big one.

- It is the responsibility of all maritime nations and stakeholders of industry to co-operate and find a solution for sustainable development of ship recycling industry without affecting the environment and human health.

- Various generic labour and environment protection laws should be incorporated under a single umbrella of Ship Breaking Code. This will avoid ambiguity between various agencies while dealing with any violations.

- The present inspection regime should be strengthened by adding more man power, better training and by better resources.

# 6 Conclusion

This dissertation is an effort to bring out the present situation of the ship recycling industry in India. The difficulties of the industry are discussed from an international and national point of view.

- The various provisions of international regulatory instruments such as the Basel Convention, the Hong Kong Convention and ILO guidelines were discussed to understand the efforts by the international community to regulate this industry. The Basel Convention provides suitable ground to treat the ship as waste and provide a mechanism to regulate it under various provisions. Due to this the transportation of old ships to the ship recycling yards of India could be avoided.
- The Hong Kong Convention, 2009 highlights the of ship owners, ship breakers and other stakeholders for safe and green ship recycling. There should be a balanced approach from all stakeholders by keeping their economic interests in a positive synergy with social and environmental responsibilities. The government need to enhance stakeholder cooperation and appropriate balance to avoid distortion of power which affects the OSH and environment protection.
- The introduction of the Ship Breaking Code 2013 is a positive step by the Government of India to regulate the industry. Although India has not ratified the HKC but most of the features of the HKC are incorporated in the SBC, 2013. There have been positive signs of improvement in the industry after introduction of SBC,2013. Still there are some challenges in implementation of the Code, which can be addressed with the active co-operation between stakeholders of the industry. The role of the government agencies is vital particularly to monitor and enforce regulations.
- It is important that gradual improvement in the industry should be promoted in order to shift from present methods to more advanced and environmentally safe methods using heavy duty equipment and qualified workers. There are

examples of many Indian yards obtaining HKC compliance certificates from renewed class societies (ClassNK, LR, RINA, DNV-GL etc). This combination of public and private efforts to regulate ship recycling activities will lead to sustainable development of the industry in India.

- The introduction of the Hong Kong Convection and EU Ship recycling regulations will change the picture of the ship recycling industry in the future. To comply with international regulations, shipping companies may shift towards China and Turkey. However, their industrial capacity is not ready to meet the challenges of this shift. Therefore, it is important for the Indian ship recycling industry to embrace green recycling practices and enhance OSH in order to continue to remain a major player in the industry. The national policy and regulations need to be strictly implemented because most of the international provisions of protection of the environment and safety of workers are already in place in India. The lack of awareness among stakeholders about these provisions are a main hurdle in improving the conditions of the industry. This can be done by various awareness programmes and participation of all stakeholders in industry enhancement. Moreover, strict inspection regime will support the enhancement because it will ensure the compliance with the rules and also support awareness campaign.
- India is playing an active role towards growth of environmentally sound, safe and sustainable ship recycling industry by development of various regulatory instruments in the line with the Hong Kong Convention. Slowly but steadily the country is preparing itself toward ratification of Hong Kong Convention 2009.

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APPENDIX 1

**On site survey conducted at Alang**

The main aim of this questionnaire is to develop an integrated model which can assist in understanding safe and environmental sound ship recycling activity. The study will help in understand the effects of implementation of various regulatory instruments on sustainable development of industry. This questionnaire provides the insight of the industry from safety point of view.

**Questionnaire for worker at ship recycling yards**

1. What is your age? _____
2. You belong to which part of India _____
3. What do you work as:
   Gas Cutter, Mechanics, Supervisor, Mover & Loaders, metal separators etc.
4. Skilled/Semi-skilled/Unskilled
5. Education _____
6. Marital status_____
7. Children _____
8. How many years have you been working _____
9. Do you work under only one contractor? _____

Do you have written agreement with your employer or contractor

How have you been hired

Nature of work: permanent/temporary/casual.

Salary: Per month_____/Per day_____

Duty hours_____

Lunch break or tea break_____

Weekly holiday: Yes/No

Leave: Earned leave: Yes/No.

Casual Leave: Yes/No.

Sick Leave: Yes/No

10. Provident fund: Yes/No

Employers share in provident Fund Yes/No

Gratuity Yes/No

11. Have you undergone any pre training course_____

12. type and Duration of Training _____

13. Did the training relate well with your day to day job_____

14. Place of Residence: cemented house/ slum

Self-owned/rented/sharing basis

15. What are the facilities provided to you? In the yard

(1) Drinking water Yes/ No

(2) Health services Yes/ No

(3) Doctor Yes/ No

16. What facilities do get at the work place?

(1) First Aid Yes/ No

(2) PPE Yes/ No

17. What are commonly or widely reported diseases particularly exposure to other kind of material like poisonous gases, asbestos, metals etc. _____

_____

Have you ever had an accident at work?

Have you ever witness an accident at work?

18. Accident rate:

a. Minor :(burns/cuts etc.) Very High/ High/ Low/ Nil

b. Major: (disablement like loss of finger, hands etc.) Very High/ High/ Low/ Nil

c. Fatal: (total burn/death) Very High/ High/ Low/ Nil

19. Any type of harassment workers facing in the work place or outside: _____

20. What is the response in general of the state labour authority, port authority, employers/ contractors/general public etc. _____

_____

__

_____

__

_____

__

Any other information _____ Any suggestions

_____ Note

_____

_ Above stated information given by me is true

Name _____

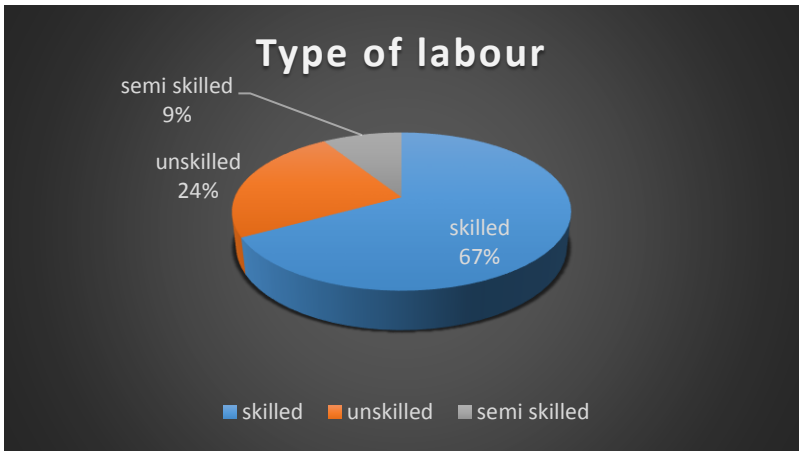
Place _____

Date _____

**Analysis of information from questionnaire**

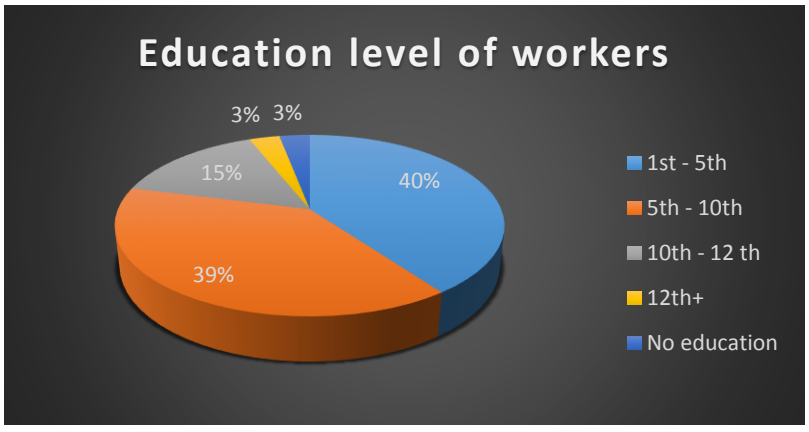
As already mentioned in the research methodology, an onsite survey was conducted among the workers (total 40) to understand various aspects of OSH. It is understood that such small number of workers does not represent the whole picture of industry.

**Case 1. Type of Labour**




**Conclusion** – It is clearly visible that majority of worker are skilled. They have spent more than 2 years in yards, thus gain required experience to be skilled. Whereas, there are sizeable numbers of unskilled and semi-skilled labours, in future this number can contribute to fatalities due to their inexperience. Therefore, effective training mechanism need to be implemented under the preview of various labour legislation.

**Case 2 – Education level**




**Conclusion** – Majority of workers are having basic or very low level of formal education. Due to this they are not aware about various hazards associated with ship recycling, they have little knowledge of occupational hazards and labour rights. Therefore, State Labour Department with close co-operation of NGOs, Industry and Unions need to conduct various awareness programmes where the importance of safety need to be imparted to them.

**Case 3 - Accident at work**


**Conclusion** – This section was included in the questionnaire to find the use of the PPE in the yards. Majority of workers reported minor accident like burns/ cuts, which was their personnel experience. The large number of minor accidents are the clear indicator that workers are not using PPEs regularly. Strict implementation of safety standards by government and industry is key to reduce this percentage of minor accidents.

**Note** – Not a single worker interviewed has ever met with any major or fatal accident at the yards. The 13% figure is obtained because workers claimed that they witnessed/ heard about major accidents. No one has ever witnessed any fatal (total burn/ death).

APPENDIX 2

**Control of Hazardous Materials**

| **Hazardous Material** | **Definitions** | **Control measures** |
|---|---|---|
| Asbestos | Materials containing asbestos | For all ships, new installation of materials which contain asbestos shall be prohibited. |
| Ozone-depleting substances | Ozone-depleting substances means controlled substances defined in paragraph 4 of article 1 of the Montreal Protocol on Substances that Deplete the Ozone Layer, 1987, listed in Annexes A, B, C or E to the said Protocol in force at the time of application or interpretation of this Annex.<br><br>Ozone-depleting substances that may be found on board ship include, but are not limited to:<br><br>Halon 1211 Bromochlorodifluoromethane<br>Halon 1301 Bromotrifluoromethane<br>Halon 2402 1,2-Dibromo-1,1,2,2-tetrafluoroethane (also known as Halon 114B2)<br>CFC-11 Trichlorofluoromethane<br>CFC-12 Dichlorodifluoromethane<br>CFC-113 1,1,2-Trichloro-1,2,2-trifluoroethane CFC-114 1,2-Dichloro-1,1,2,2- tetrafluoroethane<br>CFC-115 Chloropentafluoroethane | New installations which contain ozone-depleting substances shall be prohibited on all ships, except that new installations containing hydro chlorofluorocarbons (HCFCs) are permitted until 1 January 2020. |
| Polychlorinated biphenyls (PCB) | "Polychlorinated biphenyls" means aromatic compounds formed in such a manner that the hydrogen atoms on the biphenyl molecule (two benzene rings bonded together by a single carbon-carbon bond) may be replaced by up to ten chlorine atoms | For all ships, new installation of materials which contain Polychlorinated biphenyls shall be prohibited. |

| | | |
|---|---|---|
| Anti-fouling compounds and systems | Anti-fouling compounds and systems regulated under Annex I to the International Convention on the Control of Harmful Anti-fouling Systems on Ships, 2001 (AFS Convention) in force at the time of application or interpretation of this Annex. | 1. No ship may apply anti-fouling systems containing organotin compounds as a biocide or any other anti-fouling system whose application or use is prohibited by the AFS Convention.<br><br>2. No new ships or new installations on ships shall apply or employ anti-fouling compounds or systems in a manner inconsistent with the AFS Convention. |

Source- (Hong Kong Convention, 2009)

APPENDIX 3

**Minimum List of Items for the Inventory of Hazardous Materials**

| |
|---|
| Any Hazardous Materials listed in Appendix 1 |
| Cadmium and Cadmium Compounds |
| Hexavalent Chromium and Hexavalent Chromium Compounds |
| Lead and Lead Compounds |
| Mercury and Mercury Compounds |
| Polybrominated Biphenyl (PBBs) |
| Polybrominated Diphenyl Ethers (PBDEs) |
| Polychlorinated Naphthalenes (more than 3 chlorine atoms) |
| Radioactive Substances |
| Certain Shortchain Chlorinated Paraffins (Alkanes, C10-C13, chloro) |

Source- (Hong Kong Convention, 2009)

APPENDIX 4

**Benefits & Contributory Conditions**

| | | | |
|---|---|---|---|
| (a) | Sickness Benefit | Payment for78 days | 91 days in any two consecutive periods |
| (b) | Extended Sickness Benefit | Continuous employment for two years and contribution for 156 days in four consecutive contribution periods. | Two years |
| (c) | Enhanced Sickness Benefit | Same as above | 7 days for vasectomy and 14 days for tubectomy |
| (d) | Temporary disablement Benefit | He/she should be an employee on the date of injury | Till the incapacity exits |
| (e) | Permanent disablement benefit | Same as above | For life |
| (f) | Dependent Benefit | On the death to the wife till she is alive/ married and to family members as per conditions | |
| (g) | Funeral Expenses | He should be an insured person on the date of death | |
| (h) | Rehabilitation allowance | Entitlement to medical benefit or if disabled due to employment injury | For each day on which insured person remains admitted in fixation centre. |
| (i) | Medical benefits | No condition | Till the disability/ disease lasts |
| (j) | Vocational rehabilitation allowance skill development scheme | Not more than 45 years of age and disability not less than 40% due to employment injury | All the days of training in vocational rehabilitation centre. |

Source- (E.S.I.C, 2017)

APPENDIX 5

**List of Hazardous Materials that can be handled by GMB Hazardous Waste Treatment, Storage and Disposal Facilities, Alang**

| S.No. | Waste | Category |
|---|---|---|
| 1 | Ceramic | Landfill |
| 2 | Garbage | Landfill |
| 3 | Glass | Landfill |
| 4 | Fire Ash | Landfill |
| 5 | ACM Waste | Stabilization & Solidification |
| 6 | Asbestos | Stabilization & Solidification |
| 7 | Asbestos (Solidified) | Stabilization & Solidification |
| 8 | Cementing Materials & Tiles/Solidified Cement/Ac Sheets | Stabilization & Solidification |
| 9 | Cementing With Asbestos | Stabilization & Solidification |
| 10 | Cooling Powder | Stabilization & Solidification |
| 11 | Damaged Fibre | Stabilization & Solidification |
| 12 | Glass wool | Stabilization & Solidification |
| 13 | Incinerator Ash | Stabilization & Solidification |
| 14 | Paint Chips (Solidified) | Stabilization & Solidification |
| 15 | Rusted Iron Scales | Stabilization & Solidification |
| 16 | White Cement Powder | Stabilization & Solidification |
| 17 | Bilge Water | Effluent Treatment Plant |
| 18 | Waste Water | Effluent Treatment Plant |
| 19 | Paints & Coatings | Incinerator |
| 20 | Booch | Incinerator |
| 21 | Canvass With Chemical Coating/Chicken Mesh/Rexin/Card Board | Incinerator |
| 22 | Cargo Residue | Incinerator |
| 23 | Chemical Waste | Incinerator |

| | | |
|---|---|---|
| 24 | Chemical Waste (Solid) | Incinerator |
| 25 | Contaminated Sand | Incinerator |
| 26 | Contaminated Soil | Incinerator |
| 27 | Fibre Waste | Incinerator |
| 28 | Filter Waste | Incinerator |
| 29 | Oil Sludge | Incinerator |
| 30 | Oil Soil | Incinerator |
| 31 | Oily Cloths & Paper | Incinerator |
| 32 | Oily Rags | Incinerator |
| 33 | Oily Sand | Incinerator |
| 34 | Oily Sorbent | Incinerator |
| 35 | Paper | Incinerator |
| 36 | Puff | Incinerator |
| 37 | PVC & Plastic Waste | Incinerator |
| 38 | Rubber Gaskets & Isolation Mountings | Incinerator |
| 39 | Sedimentation | Incinerator |
| 40 | Tarry Waste | Incinerator |
| 41 | Thermocol | Incinerator |
| 42 | Used Oil/Waste Oil & Spent Lubricants | Incinerator |
| 43 | Wood Powder With Oil | Incinerator |
| 44 | Residue | Incinerator |

Source- ESCA Technical Report – 2016 by Benoit Loicq