INTERNATIONAL MARITIME ORGANIZATION

E

MARINE ENVIRONMENT PROTECTION COMMITTEE
71st session
Agenda item 16

MEPC 71/16/3
30 March 2017
Original: ENGLISH

ANY OTHER BUSINESS

Status of compliance with the Hong Kong International Convention for the Safe and Environmentally Sound Recycling of Ships by Indian (Alang) Ship Recycling Yard

Submitted by India

SUMMARY

Executive summary:	This document provides the status of compliance with the Hong Kong International Convention for the Safe and Environmentally Sound Recycling of Ships by Indian (Alang) Ship Recycling Yard
Strategic direction:	1.1
High-level action:	1.1.1 and 1.1.2
Output:	1.1.1.1 and 1.1.2.1
Action to be taken:	Paragraph 32
Related document:	Hong Kong International Convention for the Safe and Environmentally Sound Recycling of Ships

History of the Indian ship recycling industry

1 The maritime history of Indian ship building begins right from the time of civilization in Harappa and Mohenjo-Daro, as early as 2600-3000 BCE. In recent past centuries, the ship building industry in India was mainly carried out in coastal territories such as Mumbai, Cochin, Tuticorin, Mandvi-Kutch (Gujarat) and Cudalore. The ships and shipyards that existed in ancient India used to carry out international trade with existing European empires.

2 Ships built have to be disposed of at the end of their operational lives. There is no other way of ship disposal than ship recycling known to India. Like ship building, ship recycling is also a traditional business in India. Before 1900 AD, old wooden ships were manufactured and operated in international trade and were later recycled completely. Along with these Indian made wooden vessels, foreign wood ships were also brought to the Indian coast for recycling purposes only, which in a way facilitated international shipping through safe disposal in those days. Iron and brass parts, and logs used as materials of construction in sailing vessels were used in the preparation of furniture, windows, doors and artefacts in buildings in India

and were a status symbol for affluent society around 1900 AD. This meant that 100% reuse, re-processing and recycling were best practices blended in the culture of Indian society and the same is also continued today in modern India. It is understood that initially the activity had slowly picked up momentum during 1912 in Kolkata and Mumbai. The ship recycling activity in those days was a part of the larger colonial economy along with other economic activities, e.g. plantations, mining, textile, papers, etc. Obtaining steel from the ship breaking route was found to be more logical and cost effective and therefore ships were often brought for recycling to Mumbai on the western coast, and Kolkata on the eastern coast of India, respectively. When the economic recession came, around 1984, and fleet owners thought that it was better to scrap ships than to maintain them, there was a huge backlog of ships which needed to be demolished. During the recession when labour appeared to be far too costly and steel scrap was yielding a far lesser price, ships had to look for cheaper labour elsewhere. It was at this juncture that India stepped in.

3 In the first instance, this industrial migration took place in countries which were undergoing rapid industrialization, had a high demand path for steel and labour was cheaper, such as the Republic of Korea. With economic growth in these countries having stabilized, and wages along with the standard of living on the rise, the ship recycling activity passed on to the next level of developing countries of the Indian subcontinent, namely China and Viet Nam. When ship recycling came to India it was a part of the industrial relocation that started around the mid-1980s when low-skilled and low-wage jobs shifted to third world countries. Indeed, the coming of ship recycling activity to India was a part of globalization as we know it today.

4 One of the reasons why the ship recycling activity became a boon for India was due to the rise of the electric arc furnace during the mid-1980s and the rise in demand for steel melting scrap. The re-rolling mills had already started a programme of expansion during the mid-1970s and were now developing very quickly in North and West India. The development of the re-rolling mills was accelerated mainly by the boom in the construction sector in these areas, a result of rapid urbanization. Ship recycling became a source of steel scrap, whether for melting or directly re-rollable material in the re-rolling mills. In terms of price, ship-breaking scrap is historically more expensive than scrap from railways or other melting scrap, but it is cheaper than ingots from electric arc furnaces and the billets and finished steel from integrated steel plants. Hence, ship-recycled scrap conventionally has proved to be a direct competitor of the integrated steel mills in their market for semi-finished casting products.

5 Due to the increased trend of importing ships for breaking in India, effort was made to examine various sites suitable for this activity. Considering the favourable parameters for beaching methods such as a high tidal range, firm seabed, gentle seaward slope, etc., it was decided to set-up a ship-breaking yard on the western coast of India in the Gulf of Cambay near Alang village. That is how ship recycling became a new member in the industrial revolution in India and found itself the perfect host in Gujarat's Alang. The first vessel **MV Kota Tenjong** was beached at Alang on 13 February 1983, since then, the yard has witnessed spectacular growth and has emerged as a leading ship breaking yard in the world.

The inception of the Alang-Sosia ship recycling yard

6 Alang is a census town in Bhavnagar district in the Indian state of Gujarat. Alang-Sosia Ship Recycling Yard, one of the largest ship recycling yards in the world, is located on the western coast of India in the Gulf of Cambay. In the past three decades, its beaches have become a major worldwide centre for ship breaking. The shipyards at Alang recycle approximately 30% of the volume of ships salvaged around the world. It is considered the world's largest graveyard of ships. The yards are located on the Gulf of Khambat, 50 km southeast of Bhavnagar. Large super-tankers, car ferries, container ships and a dwindling number of ocean liners are beached during high tide.

7 Operations at the Alang recycling yard started in 1982 and today it is one of the choicest ship recycling destinations for shipowners around the world. The longest ship ever built, **MV Seawise Giant**, was beached there for demolition in December 2009. Alang accounts for nearly 90% of the ships broken in India, with other centres located in the states of West Bengal, Andhra Pradesh, Kerala, Tamil Nadu and Maharashtra. Noting its level of compliance, its past development, in addition to proposed expansion, Alang represents the Indian image of ship recycling.

8 Recycling of ships on a large scale requires extensive care on issues like physical, social and environmental infrastructure as well as proper safety and environment management. Successful implementation of safe and environmentally sound ship recycling requires not only financial resources but also many other governing factors such as specialized knowledge of ship dismantling, chemistry between the ship recyclers and workers, availability of land and preparedness of ship recyclers and regulators to undertake skilful operations. The Gujarat Maritime Board (GMB) is the State Government Agency working as the extended arm of port State control. DG Shipping, India, a designated regulator, has put in sincere efforts to develop these requirements to accelerate the growth of the ship recycling industry, specifically at Alang.

9 Although the largest one, in order to boost this recycling industry, Alang Ship Recycling has undergone continued efforts and has been adopting a "best practice approach" to strengthen the areas of infrastructure, regulations, health and safety, environmental aspects, economics and marketing, and thus to contribute to almost a third of the global ship recycling volume**.**

Profile of ship recycling plots

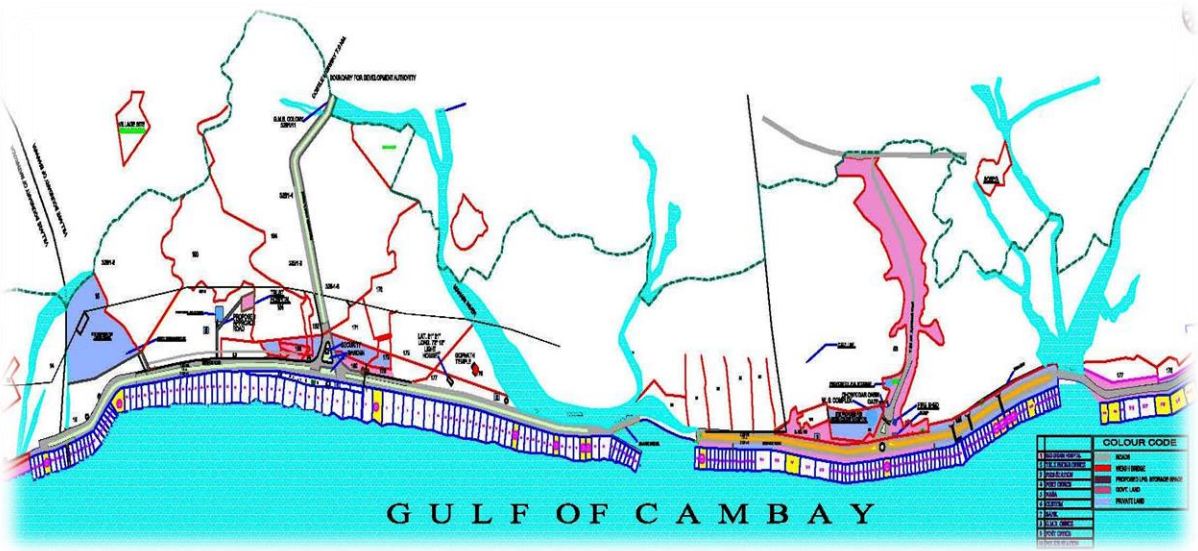
10 Alang-Sosia ship recycling yards are aligned with the North-South Gujarat Coast in the Bhavnagar District, as shown in the maps below. It extends over 10 km of the eastern coast of the Gulf of Cambay. The yard has numerous plots of various sizes, perpendicular to the coast line. The slope of the plots from shore to sea is 1:30 plus.

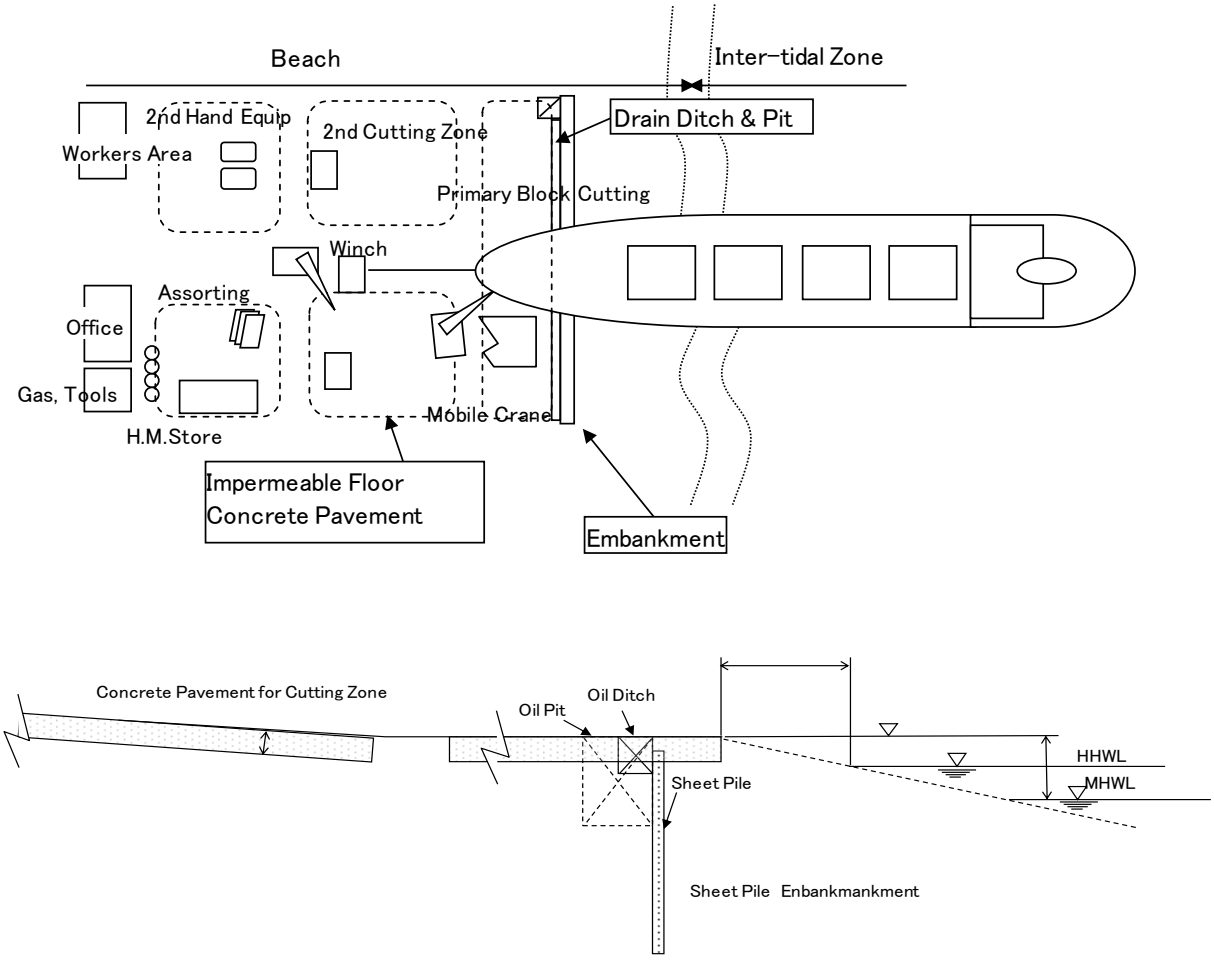
Alang-Sosia ship recycling yards

INDIA

GUJARAT

ALANG-BHAVNAGAR DISTRICT





Current Status of ship recycling yard

YEAR	NOS. OF SHIPS	LDT IN MT
1982-83	5	24,716
1983-84	51	259,387
1984-85	42	228,237
1985-86	84	516,602
1986-87	61	395,139
1986-88	38	244,776
1988-89	48	253,991
1989-90	82	451,243
1990-91	86	577,124
1991-92	104	563,568
1992-93	137	942,601
1993-94	175	1,256,077
1994-95	301	2,173,249
1995-96	183	1,252,809

YEAR	NOS. OF SHIPS	LDT IN MT
1982-83	5	24,716
1983-84	51	259,387
1996-97	348	2,635,830
1997-98	347	2,452,019
1998-99	361	3,037,882
1999-00	296	2,752,414
2000-01	295	1,934,825
2001-02	333	2,727,735
2002-03	300	2,420,724
2003-04	294	1,986,123
2004-05	196	938,976
2005-06	101	480,361
2006-07	136	760,800
2007-08	136	643,437
2008-09	264	1,945,540
2009-10	348	2,957,225
2010-11	357	2,816,231
2011-12	415	3,856,072
2012-13	394	3,575,992
2013-14	299	3,059,890
2014-15	275	2,490,152
2015-16	249	2,431,752
2016-17	238	2,535,708
Total	**7,364**	**57,420,128**

Ship Statistics

11 GMB is pleased to demonstrate the following landmark works in hardware and software for targeting safer and increasingly environmentally sound ship recycling in India.

Hardware infrastructure

12 A ship consists mostly of steel. Consequently, at the end of its useful life, it becomes a source of ferrous scrap particularly suited for reprocessing into simple steel products such as steel rods used in civil construction, plates, angel sections, furniture, wood, sanitary ware, usable equipment such as pumps, motors, valves, generators, etc. The reprocessing of steel is an alternative to steel production from ore and represents a significant saving in terms of energy consumption. Although scrap steel provides most of a ship's value, other lucrative returns come from non-ferrous items such as diesel engines, generators, deck cranes, compasses and other fixtures that can be resold. Ship scrapping is a sustainable activity from

a resource utilization point of view. Ship recycling operations would become a hazard to workers and generate hazardous waste that could enter the natural environment if the following significant aspects were not addressed appropriately:

.1 occupational safety and health; and

.2 environment.

ENVIRONMENTAL & SAFETY RELATED CONCERNS IN SHIP RECYCLING

Frequent cause of accidents such as fire & explosion, falling objects, snapping of cables, ropes etc.

Biological Hazards such as toxic marine organisms, risk of communicable disease transmitted through pest, rodents, insects

13 GMB has therefore provided the following hardware infrastructure to enhance and improve work conditions for labourers working in ship recycling and also manage hazardous waste materials in such a way that it is disposed of scientifically, in a dedicated Treatment Storage and Disposal Facility (TSDF).

Safety Training and Labour Welfare Institute at Alang

14 The training institute of GMB in Alang has been in operation for the last 14 years and has trained more than 120,000 workers so far. Each year, more than 8,000 workers are trained in the Institute. GMB has hired an agency to train the new workers, as per the National Skill Development Standards.

15 The various packages of training are as follows:

Sr. No.	Training
1	Introduction to ship recycling
2	Steel/metal cutting
3	Locational hazards
4	Hazards in ship recycling
5	Safety in material handling
6	Fire & explosion safety
7	First-aid & emergency response
8	Basic awareness about environment and cleanliness

16 Only after receiving certification from the GMB are workers considered trained for the above hazards, and are permitted to work in the plots.

Workers at the training and welfare centre, Alang

Treatment Storage Disposal Facility (TSDF) – Integrated Hazardous Waste Management Facility at Alang

17 Between 2001 and 2002, GMB engaged one of India's top consultants, M/s Engineers Indian Ltd (EIL), New Delhi for the preparation of a comprehensive waste management plan. For the first time, GMB quantified and characterized hazardous and non-hazardous waste generated from ship recycling. GMB has its in-house Environment management cell which assessed many ships beached at Alang, witnessed the recycling of the ships and studied the mass balance of the recycled ships including tankers, bulk carriers, container vessels, referred vessels and passenger liners. EIL performed laboratory tests and studied material safety data sheets for those materials which were neither categorized as hazardous waste or non-hazardous waste.

18 The following table prepared during the 2001-2002 study shows the estimated quantities of waste of a hazardous and non-hazardous nature for 350 ships of average light displacement (LDT) of 10,000 MT.

Description of waste	Quantity in tonnes per 350 ships per year	Category Hazardous (H) or Non-Hazardous (NH) waste
Asbestos containing waste	175	H
Glass-wool and Thermocol	2,000-3,000	H
Sludge residues and contaminated materials	400	H
Plastics and cable pieces (with paint chips)	20	H
Rubber	49	NH
Fibre glass pieces	40	NH
Rexene pieces	50	NH
Iron Scale	900	H
Chicken mess	175	NH
Cardboard and packaging materials	35	NH
Glass pieces	175	NH
Municipal solid waste	5,000	NH
Cement tile pieces	10,000	NH
Bilge water	10,500 kilolitres	H

19 Accordingly, GMB has constructed landfill sites, as follows, in 2004-2005:

.1 three cells, i.e. disposal for asbestos and glass wool waste (43,000 m^3), disposal for industrial hazardous waste (10,200 m^3) and disposal for municipal solid waste (8,700 m^3) in 2005-2006;

.2 looking at completion of life of the landfill cells constructed in 2005 and the needs of other environment infrastructures at the site, it was decided to upgrade the existing TSDF site; and

.3 GMB has already upgraded the site from 2011-2013 with new landfill cells (100,000 m^3) other facilities, i.e. incinerator (5 metric tonnes/day), bilge water treatment plant (30 kilolitres per day) and firefighting system and thus it becomes a fully integrated waste management facility.

20 Existing environmental facilities at Treatment Storage Disposal Facility (TSDF) site, Alang

	Item		Capacity
1	Landfill cell for hazardous waste		70,000 m^3
2	Landfill cell for municipal solid waste		35,000 m^3
3	Common hazardous waste incinerator		5 mt/day
4	Fire hydrant system	Underground reservoir	200 m^3
		Over ground reservoir	5 m^3 × 2
5	Effluent treatment plant		30 kilolitres/day

21 Asbestos handling at Alang

.1 Asbestos Containing Material [ACM] handling, scrapping and packing as per the US Occupational Safety and Health Administration (OSHA) guidelines.

.2 Negative pressure chamber for removal, handling and packing of ACM on shore.

.3 Negative pressure inflatable unit for removal, handling and packing of ACM onboard.

.4 Bi-yearly medical tests for all involved in removal, scrapping, handling and packing of ACM

.5 Asbestos Personal Protective Equipment (PPE) Kit usage and disposal for "zero" exposure to ACM during removal, scrapping, handling and packing of ACM

.6 Training and awareness about ACM health hazards to all ACM handlers.

22 Waste Disposal at TSDF-Alang Site

Year	No. of Ship	LDT	Hazardous Waste (HW)			MSW		
			HW in MT	Kg of waste/LDT of ship	% of Waste to the weight of the ship	MSW in MT	Kg of waste/LDT of ship	% of waste/ weight of the ship
2006-07	136	760,800	1,032.86	1.357	0.13%	46.20	0.061	0.006
2007-08	136	643,437	2,017.02	3.134	0.31%	828.42	1.287	0.129
2008-09	264	1,944,162	5,027.84	2.586	0.25 %	855.26	0.44	0.044
2009-10	348	2,937,802	5,418.04	1.844	0.18 %	726.17	0.25	0.025
2010-11	357	2,816,236	8,215.31	2.917	0.29 %	729.10	0.26	0.026
2011-12	415	3,847,000	8,318.98	2.162	0.22 %	552.43	0.14	0.014
2012-13	394	3,847,566	10,555.55	2.743	0.27 %	770.55	0.20	0.020
2013-14	298	3,059,891	7,505.89	2.451	0.24%	889.02	0.29	0.029
2015-16	249	2,431,752	4,996.31	2.05	0.20%	368.65	0.015	0.015
2016-17 to 28-02-2017	238	2,535,708	6,022.98	2.37	0.23%	612.59	0.024	0.024

23 GMB is constantly carrying out drives for the reuse, reduction and recycle of ship recycling materials leading to the minimization of waste received at the TSDF at Alang.

24 Health facilities at Alang

.1 Alang Red Cross Hospitals for primary medical treatment. The hospital is financially assisted by GMB.

.2 Another private hospital permitted by GMB also known as "Alang Hospital" for secondary medical care. It has 33 beds. It is equipped with an X-ray facility and medical stores. Two doctors are available permanently. For any eventuality, expert doctors are also called to provide treatment to the affected workers.

.3 HCG Hospital and Bajarang Bapa Hospital, Bhavnagar are available for tertiary treatment.

25 In cases of emergency, workers are given immediate treatment in the above hospitals depending upon the types of accident and irrespective of limit of ESIC cover. In addition to the above, the following further facilities are also available at Alang:

.1 108 dedicated ambulances are made operational by GMB; and

.2 as per Rule 10 of the Factory Act, 1948, the medical examination of workers is carried out by SRIA, engaging Associate Fellows (Dr.) of Industrial Health (AFIH) Certified Doctors. Ship Recycling Industrial Association (SRIA) of India has engaged two such factory medical officers (qualified Doctors) for this purpose.

Red Cross Hospital, Alang mobile medical van

Housing facility for workers

26 GMB and SRIA have provided housing facilities to the workers in the first phase for accommodating 1,008 persons. The facility is of the dormitory type comprising of seven blocks (having a ground floor plus two stories), canteen building, office building, shops, road, water supply and sanitary facilities with Sewerage Treatment Plant (STP), electrification, etc.

27 So far GMB has incurred expenditure to the tune of INR 150 Cr ($2.2 million) to cater for safety, health, environment and social infrastructures since its inception.

Labour colony for workers at Alang

Software measures, regulatory framework

28 For ship recycling in India, the Ship Breaking Code, 2013 was enacted by the Government of India in March 2013.

29 There was a Writ Petition filed by the NGO Research Foundation for Science and Technology in the Supreme Court of India in the year 2000, against the Union Government in Ministry of Environment and Forest and other concerned departments including State Maritime Boards, about the illegal import of hazardous waste. Ship breaking was one of the aspects included in it, looking at in-built hazardous materials used in ships' structures and equipment which later become waste in ship breaking yards and pollute the Indian coastline. Accordingly, the Apex Court took a view and passed an interim order on 14 October 2003, followed by a final order on 11 September 2007, directing the Union Government and concerned Authorities to adopt various procedures to cater for safe and environmentally sound ship recycling. One of the directions was to enact a comprehensive code to enforce the procedure prescribed by the Apex Court in its order dated 11 September 2007.

30 Ship Breaking Code, 2013 is codified guidelines comprising of various statutes and rules related to the management of hazardous waste disposal, Factory Rules, Explosive Act, Petroleum Rules, Atomic Regulatory Board Act, Labour Laws, Employee State Insurance Corporation Act, Air Act, Water Act, etc. which was prepared under consultation with DG Shipping so that alignment of the stipulations is maintained with the Hong Kong Convention for Ship Recycling (the HKC), 2009.

The Hong Kong Convention for Ship Recycling 2009 and compatibility with Indian environmental legislation

31 At present, ship recycling at Alang and India comply with the Ship Breaking Code, 2013 and also comply in general with the HKC, 2009 which may be seen in the following matrix:

Sr No.	Major aspects as per IMO Convention	Status at Alang	Remarks	Full compliance to IMO Convention
1	Recycling Facility Management Plan	Ship recyclers prepare Recycling Facility Management Plan. The plan is approved by the State Maritime Board as per the Ship Breaking Code, 2013	Complied	The Directions of Hon'ble SC issued in WP 657/95 on 6 September 2007 covers the scope of the IMO Convention regarding ship recycling states hence, Alang complies with the Hong Kong Convention for Ship Recycling in advance, before it is ratified. The Ship Recycling
2	Ship Specific Dismantling Plan	Ship recyclers prepare Ship Specific Dismantling Plan. The plan is approved by the State Maritime Board as per the Ship Breaking Code, 2013	Complied	
3	Oily Waste Reception Facility	Ship recyclers send their oily waste to the authorized oil refiners	Complied	
4	Paint Chips removal plan	Paint chips removed from the gas cutting lines are disposed at the TSDF at Alang	Complied	

Sr No.	Major aspects as per IMO Convention	Status at Alang	Remarks	Full compliance to IMO Convention
5	Asbestos Waste Handling	ACMs are safely removed by wet methods in a negative pressure chamber system	Complied	Yard at Alang also complies with the same aspects as covered under Ship Breaking Code, 2013.
6	Hazardous Waste Management	Fully operational (Landfill and Incinerator)	Complied	
7	Bilge Water Treatment Plan	Existing facility is operated by providing an Effluent Treatment Plant of 30 kilolitres/day capacity	Complied	

Current transition period

32 At Alang, there are 29 ship recyclers out of a total of 130 which are operational and have acquired statements of compliance to the Hong Kong Convention, 2009. The total ship yards at Alang is 153. In the next 2 to 3 months, an additional 31 operational plots will obtain statements of compliance to the HKC. The compliance to the HKC is checked by the International Classification Societies and the Indian Registrar of Shipping (IRS). The Classification Societies check each component prescribed under the Ship Recycling Facility Management Plan as per the HKC and then certify for it. Those Classification Societies also check an Inventory of Hazardous Materials (IHM) for the ship recycling facilities for any particular ship for the purpose of demonstration. So that the ship recycling facilities (yards) will follow the same guidelines with other ships to be permitted access to their facilities. The very purpose of using an IHM on board the vessel in ship recycling operations is to prepare a proper disposal plan for hazardous waste generated from the ship's structures and stores, as well as waste generated during the operations on the ships. The IHM helps ship recyclers to spot the hazardous materials from identified locations in each ship and also with the deployment of proper resources to remove the predicted quantity of wastes from the ships with due care. Thus an IHM provided in visiting ships is used by ship recyclers and regulatory authorities in order to protect human health, safety and to prevent environmental pollution.

33 Along with the above HKC compliant ship recycling facilities, other ship recycling facilities at Alang are examined by Gujarat Pollution Control Board, Petroleum and Explosive Safety Organization (PESO), Directorate of Factory Inspectorate, Atomic Energy Regulatory Board (AERB) and GMB to comply with Indian Regulations, i.e. Hazardous waste management rules, 2016, Petroleum rule, Factory rules, AERB Rules and GMB's safety regulations, respectively.

Preparedness of the Government of India to ratify the Hong Kong Convention for Safe and Environmentally Sound Ship Recycling, 2009

34 Looking at the above status of compliance by the Indian ship recycling sector, i.e. the necessary safety and environmentally sound infrastructure to recycle the ships is already in place and operative. Essential national regulatory framework is already enforced with codified statutes. The Ship Breaking Code 2013 and industrial players at Alang are catering for a green approach to ship recycling and are eager to upgrade their yards to international standards and slowly they are acquiring the statements of compliance to the HKC. GMB also has a master plan to upgrade entire yards, up to the level of compliance required for recycling States as per the HKC. **The Government of India is considering a move to ratify the Hong Kong Convention for Safe and Environmentally Sound Ship Recycling, 2009.**

Master plan for the upgrade of existing environmental infrastructure at Alang

35 Way Forward: Upgrading existing environmental infrastructure at Alang with financial assistance from Japan International Cooperation Agency (JICA), Government of Japan, to be implemented from 2017 to 2021.The components of the upgrade project are outlined below:

.1 upgrading 70 yards, providing impervious floors to prevent pollutants in subsoil. At present, 29 yards have already obtained statements of compliance to the HKC, 31 yards are yet to receive statements of compliance and the remaining yards (23 yards out of 153) will be upgraded in the second phase from 2020 to 2021;

.2 improvement of the existing environmental facility (Effluent Treatment Plant (ETP) incinerator and oil recovery systems, etc.);

.3 introduction of mobile decontamination units (Pollution response equipment);

.4 introduction of large mobile cranes and beach cleaning wheel loaders;

.5 introduction of tank cleaning barge;

.6 introduction of a multipurpose vessel, this was assessed by the JICA to be vital for any oil spill disaster at sea during the decontamination process by off-shore tank cleaning barge so that in oil spill situation, oil spill recovery may be done immediately on the spot and to combat firefighting in fire accidents if any occur during the oil removal process undertaken at anchored tankers and in any of ships at Alang; and

.7 improvement of the Workers' Colony and construction of a community hall and school (CSR Activities).

36 The total cost for the above project is estimated at about $90 million. As studied by JICA, after thorough improvement of the yards, Alang Ship Recycling Yard would contribute to more than 50% of the global ship recycling business.

Action requested of the Committee

37 The Committee is invited to take note of above information.