DNV·GL

INSPECTION OF A SHIP RECYCLING FACILITY

Site Inspection Report Application 27

European Commission DG Environment

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Project name: Inspection of a ship recycling facility DNV GL AS Maritime Report title: Site Inspection Report **Environment Advisory** Application 27 Veritasveien 1 Customer: European Commission DG Environment, 1363 Høvik Customer contact: Norway Date of issue: 2020-05-08 Tel: Project No.: 10168575 Organisation unit: Environment Advisory Report No.: 2019-1221, Rev. 0 Document No.: 11GH3AWB-2 Applicable contract(s) governing the provision of this Report: 070201/2019/810137/ENV.B.3 Objective: To document the results of the site inspection at JRD Industries, located in Alang-Sosiya (Gujarat, India), following the facility's application for inclusion in the European List of ship recycling facilities. Prepared by: Verified by: Approved by: Principal Consultant Head of Section Principal Consultant Principal Consultant Copyright © DNV GL 2020. All rights reserved. Unless otherwise agreed in writing: (i) This publication or parts thereof may not be copied, reproduced or transmitted in any form, or by any means, whether digitally or otherwise; (ii) The content of this publication shall be kept confidential by the customer; (iii) No third party may rely on its contents; and (iv) DNV GL undertakes no duty of care toward any third party. Reference to part of this publication which may lead to misinterpretation is prohibited. DNV GL and the Horizon Graphic are trademarks of DNV GL AS. DNV GL Distribution: Keywords: $\ oxdot$ OPEN. Unrestricted distribution, internal and external. Ship recycling, ship recycling facility plan, ☐ INTERNAL use only. Internal DNV GL document. hazardous waste, waste management, ☐ CONFIDENTIAL. Distribution within DNV GL according to health, safety. applicable contract.* ☐ SECRET. Authorized access only. *Specify distribution: 2020-05-08 First issue

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Photos from the new hospital under development and the firefighting station (March 2019) $\,$

GEPIL Appendix 2:

List of abbreviations

AERB - Atomic Energy Regulatory Board

ASSRGWA - Alang Sosiya Ship Recycling and General Workers' Association

CSIR - Council of Scientific and Industrial Research

DISH - Directorate of Industrial Safety & Health

DNV GL - a global quality assurance and risk management company

EPRP - Emergency Preparedness and Response Plan

ESIC - Employees' State Insurance Corporation

GEPIL - Gujarat Enviro Protection and Infrastructure (waste management facility in Alang)

GMB - Gujarat Maritime Board

GPCB - Gujarat Pollution Control Board

HSE - Health, safety and environment

IHM - Inventory of Hazardous Materials

ILO - International Labour Organization

IMO - International Maritime Organization

IMS - The quality management system of Shree Ram

NABL - National Accreditation Board for Testing and Calibration Laboratories, a Constituent Board of Quality Council of India

PPE - Personal protective equipment

QMS - Quality management system

RPCB - Rajastan Pollution Control Board

SOC - Safety Observation Card

SRFP - Ship Recycling Facility Plan

SRIA - Indian Ship Recycling Industry Association

SRP - Ship Recycling Plan

SRR - EU Ship Recycling Regulation

1 EXECUTIVE SUMMARY

The objective of this report is to document the results of the site inspection of J.R.D. Industries (the applicant, the facility), located in Alang-Sosiya (Gujarat, India), following the facility's application for inclusion in the European List of ship recycling facilities. The on-site inspection took place on 14th and 15th of October 2019.

During the site inspection, the applicant demonstrated their management and execution of ship recycling performed at their facility, together with their interaction with relevant governing authorities.

The applicant appears to have a well running facility with a suitable organisation, a proven track record, has procedures with regards to health and safety and has in place facilities which one would expect for a facility applying for inclusion in the European List of ship recycling facilities. It was evident that the applicant had also made important investments in recent years to upgrade its ship recycling capability.

The governing document for the site inspection, defining the baseline of the facility's performance, is the Ship Recycling Facility Plan (SRFP). A principal task of the site inspection was to verify that the SRFP is a living, logical and systematic document accurately reflecting the operational practices at the facility.

Based on the findings of the site inspection, the evaluators prepared a draft report which was forwarded to the facility for comments in December 2019. The draft report specified the following main areas where compliance with the requirements for inclusion in the European List of ship recycling facilities could not be confirmed during the inspection:

- 1. Ship Recycling Facility Plan (SRFP): The evaluators could not verify that all procedures and practices observed at the facility were included and explained in the SRFP. In the evaluators' opinion the SRFP must be revised to ensure that it is a practical instruction targeted to the workers at the facility. Considering the comments on the SRFP in this report, and the detail comments in each discipline, the procedures should be improved in presentation and detail, tidied up in the form of useful, practical instructions.
- 2. <u>Environmental monitoring</u>: Compliance could not be confirmed for environmental monitoring during the site inspection, but the applicant has forwarded a monitoring program which is a good improvement. Some improvements are required for soil/sediment and water as specified in this report before full compliance can be confirmed.
- 3. Protection of the intertidal zone: Compliance could not be confirmed for demonstration of the control of any leakage in particular in the intertidal zone and for the handling of hazardous materials only on impermeable floors with effective drainage systems. Cutting of the bottom of the hull takes place in the intertidal zone and not on impermeable floor with effective drainage system. The facility has however taken steps to reduce the potential of environmental impact in the intertidal zone by way of placing steel plates in this area. The facility indicated that they dismantle the bottom of the hull of ships in the intertidal zone in compliance with the requirements of the EU Ship Recycling Regulation. Additional evidence is needed on this point to confirm compliance.
- 4. <u>Drainage system</u>: The effectiveness of the drainage system for the secondary cutting zone was questioned. The facility was asked to review the drainage system arrangement, perform calculations and tests to demonstrate the capacity of the systems and incorporate any modifications found to be necessary.
- 5. <u>Waste management</u>: It is a requirement that all waste generated from the ship recycling activity are only transferred to authorised waste management facilities. On site and from the SRFP it is

- evident that most equipment, lose or fixed, is removed and sold. Until recently, no sampling was conducted before materials and equipment were sold for re-use, hence materials containing hazardous materials may have been re-sold. The applicant has initiated sampling, which is a positive development, but some improvements are required with regards to analysis and accreditation of the laboratories before full compliance can be confirmed.
- 6. Medical facilities/hospital situation: the lack of adequate hospital facilities in the Alang area remains an issue, which has not been resolved. Although the new GMB Multi Speciality Hospital has improved the situation, it appears that this facility at present has only limited emergency capabilities. Discussions with the ASSRGWA also confirmed that this hospital has inadequate capacity for the whole Alang workforce and lack of capacity to treat serious injuries. As of today, the only public hospital with sufficient emergency capabilities equipped to treat serious injuries is located in the city of Bhavnagar, approximately 1.5 hours' drive away from the Alang yards. However, the applicant has reported that the existing facilities at the GMB hospital are continually being upgraded. Reportedly, they have an ICU and a Burn Unit; furthermore, the hospital has tie-ups with Specialty Surgeon from Bhavnagar who would be available on call from Bhavnagar. Moreover, it is understood that the applicant is currently working on further upgradation of the existing health care facilities in Alang, together with other ship recycling facilities. Reportedly, a GAP assessment of existing medical facilities against international/national standards has been organized by medical consultants (Critical Care specialist) and resulted in concrete recommendations for improvements. The evaluators welcome all these measures and efforts of the applicant to improve the hospital situation. However, the evaluators have not seen the actual GAP analysis referred to by the applicant and the resulting recommendations. Furthermore, in the absence of a concrete implementation action plan for the said recommendations, including timeframes and information on the availability of the necessary human and budgetary resources, the prospect of achieving the desired improvements remains unclear.
- 7. <u>Downstream waste management facilities</u>: Ensuring sustainable downstream management of wastes generated by the ship dismantling activities is an important requirement under the EU Ship Recycling Regulation. Most of the waste generated by the ship dismantling activities of the yard are transferred to the local TSDF (Treatment Storage and Disposal Facility) in Alang operated by GEPIL. Based on the information currently available to the evaluators, it appears that this facility is likely operated in accordance with human health and environmental protection standards that are broadly equivalent to relevant international or EU standards. However, GEPIL is not able to handle certain types of wastes (such as e-waste, batteries, etc.), which are therefore transferred to other waste management facilities. Most of the concerned facilities are located in the state of Gujarat and operate under a license issued by the GPCB, which contains specific requirements for emissions to air, water etc. and monitoring requirements. For most of the facilities, the requirements prescribed in the relevant GPCB licenses appear to be broadly comparable to the contents of licenses issued to similar facilities in the EU. However, in order to ascertain whether they follow standards broadly equivalent to international and EU standards in practice, the evaluators would need further information on the actual operation of these facilities, including on their compliance with the specific requirements prescribed in the relevant licences.

In response to the draft inspection report, in February 2020 the applicant submitted detailed comments on the shortcomings identified by the evaluators during the site inspection, together with several additional supporting documents, including an updated version of the SRFP dated 24.02.2020.

The additional information and documentation provided by the applicant contained a lot of useful elements in response to the findings of the inspection, which is appreciated and shows the applicant's commitment for further improvements. Many procedures have been updated in response to the draft report, however the implementation of these procedures must be evaluated on-site prior to concluding recommendations with regard to inclusion in the European list.

2 INTRODUCTION

The European Commission DG Environment (hereafter referred to as The Commission) has contracted DNV GL to conduct a site inspection of the recycling facility JRD Industries, located in Alang-Sosiya (Gujarat, India), hereafter referred to as the facility. The application for inclusion in the European List of ship recycling facilities has been registered for this facility under application number 27.

3 OBJECTIVE

The objective of the on-site inspection is to verify compliance of the facility with the requirements set out in the Ship Recycling Regulation Articles 13, 15 and 16 and clarified in the 2016 Technical guidance note¹.

Hereunder the objectives of DNV GL's methodology is to:

- Verify the Facility's capability to comply with the regulations and requirements listed in the assessment scope
- Assure that documented recycling processes, work procedures, quality controls and document handling are managed and implemented as specified in the regulations and requirements
- Ensure that the Facility has sufficient knowledge and understanding of the regulations and requirements for recycling facilities
- Assure consistent evaluation of facilities on equal terms

4 SCOPE OF WORK

The scope of the assessment is, according to contract:

- Ship recycling regulation (EU) No 1257/2013
- Technical guidance note under Regulation (EU) No 1257/2013 on ship recycling

Both documents refer extensively to the provisions of the Hong Kong Convention and the relevant guidelines of the IMO, the ILO, the Basel Convention and of the Stockholm Convention on Persistent Organic Pollutants, which are also taken into consideration for this assessment.

The scope for the methodology is divided into three main elements and a number of second and third level sub-elements. These practical steps ensured that all articles 13, 15 and 16 SRR requirements for inclusion of a ship recycling facility in the European List were checked.

1. Management

- · Facility business model and quality statement
- Policy
- Management, ownership and organisation
- Quality assurance systems and certificates

¹ C/2016/1900, Communication from the Commission — Requirements and procedure for inclusion of facilities located in third countries in the European List of ship recycling facilities — Technical guidance note under Regulation (EU) No 1257/2013 on ship recycling. Available at: https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52016XC0412(01)&from=EN

Human resources (availability, skills and experience, training, stability etc.)

2. Safety, security and the environment

- Safety & health (PPE, hazardous materials, fire safety, medical services etc.)
- Security
- Environment (spills, emissions, etc.)
- Emergency preparedness and response (fire, medical, environmental etc.)
- Regional conditions (acts of nature, political, etc.)

3. Vessel demolition

- Applied rules, regulations and internal standards
- Recycling control, inspection and supervision regime
- Non-conformities and corrective actions
- Document control
- Facilities (methods, capacities, condition of equipment, logistics, etc.))
- Maintenance
- Recycling planning and execution
- Methodology, criteria and performance regarding:
 - Project start-up, commercial process etc.
 - Ship Recycling Facility Plan (SRFP)
 - Contract review, verification and acceptance criteria owner / cash-buyer / facility
 - Pre-planning
 - Vessel preparation (IHM, Ship Recycling Plan, flag state clearance, pre-cleaning etc.)
 - Vessel arrival and securing
 - Demolition management (methodology, "safe for entry", "safe for hot work", working at heights, lifting, supervision and reporting)
 - Waste disposal (sorting, sub-contractors, end users)
 - Completion instruction
 - Project close-out with de-briefing, lessons learned, suggestions for improvement

5 METHODOLOGY AND ACTIVITIES

The methodology followed the framework of DNV GL's facility assessment protocols and reporting formats, calibrated with the requirements and criteria of the Ship Recycling Regulation as clarified in the 2016 Technical guidance note.

Activities:

- Preparations, scheduling, travel arrangements, fact-finding, etc.
- Issue objective, scope and schedule to facility in advance
- Site assessment; duration of 2 days, 3 assessors (+2 assessors in training)
- Reporting
- Issue of draft report
- Implement comments to the draft report
- Final report

The on-site assessment was performed according to a schedule advised to the Facility in advance, incorporating:

- · Opening meeting
 - Introductions, present objective, scope and methodology, agree on schedule
 - Review of facility history, current activities, future ambitions
- Interviews with key responsible personnel in all relevant disciplines, including
 - Ownership and management
 - Contracts
 - Planning, preparations, vessel arrival and securing
 - Quality assurance, quality management systems
 - Human resources
 - Health, safety, security and environment
 - Vessel dismantling management
 - Quality control, document control
 - Project management
- Document review
 - Spot checks and evaluation of consistency, content, validation and language. Traceability
- Facility site inspection
 - Inspection of Facility, all workstations and worker facilities

- Inspection of vessel, for access and escape-ways
- Spot-checks of worker certificates and permits, crane certificates
- Lifting equipment, fall barriers, safe for entry, safe for hot-work etc.
- Questioning (brief) of foremen / supervisors on key procedures

Closing meeting

- Reiterate the objective of the inspection and present preliminary results in way of initial observations and findings
- Facility may respond to the initial results, and agree to rectify non-conformities including deadlines and corresponding responsible persons
- Acknowledgements and departure

The objective of the inspection is to verify compliance with the provisions of Articles 13, 15 and 16 of the Regulation as well as with the information submitted by the recycling facility with its application for the inclusion in the European List.

6 RESULTS OF THE SITE INSPECTION

The facility submitted an application for inclusion in the European list of ship recycling facilities in October 2018. Several additional documents were sent to the European Commission afterwards. Based on this information, a desk assessment report was transmitted to the facility in June 2019. It was agreed between the European Commission and the facility that an on-site inspection could take place to verify compliance with the requirements of the EU Ship Recycling Regulation. The on-site inspection of the facility was carried out on the 14th and 15th of October 2019.

The SRF is operating at plot 30 in the coastal town of Alang, in Bhavnagar district, Gujarat, India. The SRF is one of the many ship recycling facilities located within the designated 'Alang-Sosiya Ship Recycling Yard' under the administrative control of Gujarat Maritime Board (GMB). Adjacent to the facility and both to the east and the west are similar facilities. Access road connecting with the road transportation network is accessible to the north of the facility.

J.R.D. Industries has operated in the ship dismantling industry for several decades and acquired plot 30 in Alang in 1999. The main representatives from the facility during the inspection were



In connection with the inspection, separate meetings with the Gujarat Maritime Board (GMB) and Gujarat Pollution Control Board (GPCB) took place in Gandhinagar on the 9th of October 2019. In addition, the inspection team had another meeting with the regional office of the GPCB in Bhavnagar in the evening the 14th of October 2019. Furthermore, a meeting with the ASSRGWA was held in the afternoon the 11th of October 2019 and a visit to the new GMB Multi Speciality hospital was also arranged in the afternoon the 14th of October 2019.

The table below summarises the results of the site inspection with respect to article 13, 15 and 16 of the SRR requirements for inclusion of a ship recycling facility in the European List. In addition, it considers additional information received from the facility after the site inspection.

DNV GL wishes to thank the management and key personnel at JRD Industries for the friendly reception and good co-operation extended during the assessment, ensuring that the inspections could be carried out in an effective manner. Facilities for the assessment itself were excellent and the fullest degree of access to all aspects of the facility's areas and management was offered.

Site inspection	on results		Compliant?		
Article 13-1 (a	Article 13-1 (a) it is authorised by its competent authorities to conduct ship recycling operation				
Technical guidance note 2.2.1, MEPC 210(63) Section 3.2.2	Authorisation	The facility is authorised by the competent authorities (GMB and GPCB) to conduct ship recycling. The authorisations by the GMB and GPCB contain conditions under which the facility should operate its activities. The GMB Plot Renewal Permission is valid until 01.01.2026. The GPCB Authorisation submitted as part of the application file was due to expire on the 23.03.2019. Renewed authorisation was shown on site and forwarded in response to the draft report.	Compliance was confirmed during the inspection.		
Article 13-1 (b) it is designed, con	structed and operated in a safe and environmentally sound manner			
Technical guidance note 2.2.1	Measures and infrastructure	Measures and infrastructure are partially in place to prevent leakages to the environment. The facility uses the beaching/intertidal landing method. Primary cutting of the hull is conducted in the intertidal zone using the interior of the ship itself as an impermeable floor. Cutting of the double bottom takes place in the intertidal zone on steel plates. All secondary cutting takes place on concrete flooring with drainage. Dismantled materials from the ship to shore are transported by crane, in appropriate containers for smaller parts, without contact with the intertidal zone. - Zero impact on the environment during primary cutting could not be verified, despite good procedures appearing to be as reported - Environmental monitoring is not fully in place In response to the draft report the applicant replied: "The infrastructure has been upgraded from steel plate to a double layered steel structure. The plates are welded so that the platform is completely impermeable. Additionally, towards the end of this structure, the SRF is placing a wedge such that any vessel being pulled upon it would be lifted clear of the structure leaving a clearance of about more than one foot. When SRF plans to cut the keel / DB, slag collection trays shall be placed in between the gap for collection of slag or any leakages during DB cutting. Once the DB is cut and removed, the trays would be cleaned	Compliance was partly confirmed during the inspection.		

and additionally, the impermeable surface of the steel structure will be swept clean. This will ensure that all slag and debris are fully captured for proper disposal leading to zero impact of primary cutting on the environment."

Further details are provided in the updated SRFP (dated 24.02.2020) section 2.6.3.4 Cutting of Double Bottom, but improvements must be evaluated during a potential future site inspection.

Detailed evaluation can be found in the following sections of this report.

Article 13-1 (c) it operates from built structures

Technical
guidance note
2.2.4

Operates from built structures

The total area of the plot is shoreside 2340 m² and the plot does not have a backyard. The plot was observed to be concreted. All working areas are on impermeable floor, divided into four areas:

Area 1: 283,40 m²

Area 2: 736,52 m²

Area 3: 365,15 m²

Area 4: 173,77 m²

The size of the combined working areas is 1558,8 m². In addition to the working areas there are office buildings and hazardous waste and waste storage areas.

The operation on dry shore is from built structures with cranes, winches and trucks, on concrete flooring. The secondary cutting area ends in an embankment towards the intertidal landing area. The height of the embankment is approximately 2.5m. The secondary cutting area was found covered with concrete, with steel plates in designated cutting areas.

Storage tanks, storage- and separation areas, storerooms and offices, sanitary equipment, workers rest- and recreation rooms, first aid room, emergency room and emergency

Compliance was

partly confirmed

during the inspection.

chests, worker facilities, workshops and drinking water supply were identified on site.

The facility has a small worker dormitory complex on the plot, this is primarily reserved for supervisors or persons with positions of similar responsibility. A separate workers dormitory is located a short distance away.

The secondary cutting areas were covered with impermeable, reinforced concrete.

However, this is not the case for the primary cutting area in the intertidal zone; hence, the primary cutting of the vessel is not operated from a built structure.

In response to the draft report the applicant replied: "Please refer our reply in above 2.2.1 and SRFP Section 2.6.3.4 Cutting of Double Bottom."

The improvements made can be evaluated during a potential future site inspection.

Article 13(1) (d) it establishes management and monitoring systems, procedures and techniques which have the purpose of preventing, reducing, minimising and to the extent practicable eliminating health risks to the workers concerned and to the population in the vicinity of the ship recycling facility, and adverse effects on the environment caused by ship recycling

Technical guidance note 2.1.4 (a), (b) MEPC210(63) Section 3.4.1 / BC TG 6.2

General

In response to comments in the desk assessment, the applicant contracted a third party to prepare a monitoring plan of health risks to workers and adverse effects on the environment. Monitoring of risks to the population in the vicinity of the ship recycling facility could not be located in the received documents. Two different reports were forwarded, titled 'Clara Start – Environmental report – Visit 01' and Intermittent – Environmental report – Visit 02'.

The results commented below represent the first and second round of sampling conducted by the company Go Green Mechanisms Pvt. Ltd. It is described in the monitoring plan that this initial sampling represents a baseline understanding of the conditions at site and that this baseline can be used to monitor operational improvements to reduce or eliminate further pollution. Go Green Mechanisms Pvt. Ltd laboratory is recognized by Ministry of Environment and Forests as an Environmental Laboratory (MOEF), holds a Recognition as

Compliance was partly confirmed after the inspection.

Schedule -II Environmental Auditor by GPCB and accredited by National Accreditation Board for Testing and Calibration Laboratories in India (NABL) under ISO 17025:2017.

The evaluators could not confirm that the laboratory is accredited to conduct analysis on all relevant parameters. The applicant was requested to discuss the findings described in more detail below with the laboratory. During a meeting with the laboratory in March 2019 they stated that they had all the recognitions they needed.

The evaluators asked GMB for clarifications with regards to what requirements apply for the companies involved in environmental monitoring of the ship recycling yards. They replied that "per the clause No. 6.4.3 of the Chapter No. VI of the Ship Breaking Code-2013, State Pollution Control Board shall carry out regular monitoring of ambient air, soil, sediment and marine water quality at the Ship Recycling Yard." They added that "For marine water, SW-IV criteria as per the EP act 1986 is applicable for marine water at Alang Sosia region. As far as State Maritime Board concerned, SMB shall carry out twice yearly monitoring through any Council of Scientific and Industrial Research (CSIR) laboratory, Govt. of India or the environmental labs recognized under the Environment (Protection) Act, 1986.Environmental Audit of ship recycling yards are carried out by the Schedule-I/II Environmental Auditors recognized by SPCB."

Go Green Mechanisms Pvt. Ltd laboratory holds a Recognition as Schedule -II Environmental Auditor by GPCB and a copy was forwarded by the applicant as part of the monitoring program.

In this context, it should be also noted that the National Green Tribunal of India has recently ordered a comprehensive environmental audit to be conducted with respect to the existing environmental impact of the shipbreaking activities in Alang (link: http://www.indiaenvironmentportal.org.in/files/file/ship-breaking-environment-impact-NGT-order.pdf). It is understood that this study should have been completed by December 2019. Reportedly, the GMB is a project proponent and would facilitate the environmental audit team. It appears that the environmental audit will be conducted by Central Salt and

		Marine Chemicals Research Institute.	
		In response to the draft report the applicant replied: "We have approached Central Salt and Marine Research Institute for Environmental monitoring and received their proposal. Please Find annexed Accreditation and Proposal as attachment 2a. Additionally, we have identified	
		AES Laboratories, Noida whose NABL Accreditation covers most of the desired parameters.	
		They have provided us with their NABL accreditation and a letter in which they explain/plan	
		for the minor omissions. If this is acceptable, we will use AES Laboratories as our Sub	
		Contractor. Please see attachment 2b and 2c in this regard."	
		Central Salt and Marine Research Institute can be used for sampling and analyses for	
		parameters they are accredited to analyse. For other parameters AES laboratories can be	
		used, please ensure that the laboratory holds the required analysis for the right medium in	
		its scope of accreditation. E.g. Accreditation for PCB in marine materials, textile and textile	
		material etc. (page 7 of the AES accreditation) cannot be used as an accreditation of PCB in	
		soil.	
		The improvements initiated can be evaluated during a potential future site inspection.	
Sc	oil/ sediment	The report describes that 32 samples of sediments were taken in a grid at two different	Compliance was
		depths (1-12 cm and 20-30 cm). The samples were analysed for asbestos, heavy metals,	partly confirmed
		PAH, PCB, PBB, PBDE, PFOS, HBCDD, SCCP, PCN and TBT.	after the
		The results of the first analysis show that copper, iron, lead, manganese, nickel and zinc	inspection.
		were present in concentration above the provided reference level for one or more samples.	
		The reference standard used in the monitoring program is USEPA 2011. For sample B1,	
		taken at 10-12cm depth, the concentration of copper was analysed to 831 mg/kg. The	
		reference level in the US EPA for copper is 92 mg/kg. The concentration of copper in B1 is	
		very high. The other samples have lower concentrations of copper, generally around 150 -	
		350 mg/kg. Sample B1 may represent a hot-spot as this concentration is not representative	
		for the other samples.	
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	For the second round of sampling the results showed that chromium, copper, iron, lead, manganese, nickel and zinc in the sediment samples were in higher concentration at all sampling locations in the intertidal zone. It was established that Go Green Mechanisms Pvt. Ltd is not accredited to analyse asbestos, heavy metals, TBT and the persistent organic pollutants PCB, PBB, PBDE, HBCDD, PCN, SCCP and PFOS. The IMO guidelines for safe and environmentally sound ship recycling specify that 'The monitoring programme [] should utilise well-established standards for the sampling and analysis of relevant environmental parameters'. Well established standards for sampling requires that the laboratory used holds the accreditation for the parameters they analyse. The applicant is requested to take new samples and analyse the missing parameters by accredited laboratories. Secondly the applicant is requested to compare the obtained	
	results with a recognized standard. Thirdly, the applicant is requested to compare the obtained results with a recognized standard. Thirdly, the applicant is asked to investigate possible counter measures for the possible exceeding parameters. The improvements initiated can be evaluated during a potential future site inspection.	
Water	Four samples of sea water were collected and analysed for PAH, heavy metals, PCB, PBB, PBDE, PFOS, HBCDD, and PCN. TBT and SCCP has not been analysed. The results in the monitoring program have been compared against the US EPA Quality Criteria for Water (1986), Water Quality Standards for Coastal Waters Marine Outfalls and Canadian Environmental Protection Act, 1999.	Compliance was partly confirmed after the inspection.
	The analysis results of the initial sampling showed that the total alkalinity was 330.0 mg/L, 290.0 mg/L, 320.0 mg/L and 480.0 mg/L respectively which is exceeding the limit of 20 mg/L as per primary water quality criteria for Class SW-IV (For Harbour Waters) (compared to US EPA Quality Criteria for Water (1986)). With reference to the report no. 2, the oil and grease content is found out to be 11 mg/L which is exceeding the permissible limit of 10	

	mg/L by 1mg/L (compared to Water Quality Standards for Coastal Waters Marine Outfalls).	
	For the second round of sampling, the concentration of iron and total alkalinity was 3.4 mg/L and 140.0 mg/L respectively (compared to USEPAQuality Criteria for Water, 1986). Both concentrations exceeding the norms of 1.0 mg/L and 20.0 mg/L respectively.	
	It was established that Go Green Mechanisms Pvt. Ltd is not accredited to analyse TBT and the persistent organic pollutants PCB, PBB, PBDE, HBCDD, PCN, SCCP and PFOS. TBT and SCCP have not been analysed.	
	The applicant is requested to take new samples and analyse the missing parameters by accredited laboratories. Secondly the applicant is requested to compare the obtained results with a recognized water standard. Thirdly, the applicant is asked to investigate possible counter measures for the possible exceeding parameters.	
	The improvements initiated can be evaluated during a potential future site inspection.	
Air	Air samples were taken at 6 different locations. In four samples the concentrations of PM10 (PM $_{10}$ is particulate matter 10 micrometres or less in diameter) were measured to 104.6 μ g/m 3 , 157.2 μ g/m 3 , 158.7 μ g/m 3 and 158.7 μ g/m 3 respectively, exceeding the norm of 100 μ g/m 3 as per Indian National Ambient Air Quality Standards 2009 (NAAQS 2009).	Compliance was confirmed after the inspection.
	For all six samples the Nickel concentrations were 276.0 ng/m³, 368.9 ng/m³, 160.4 ng/m³, 218.7 ng/m³, 25.6 ng/m³ and 247.1 ng/m³ respectively, exceeding the norm of 20 ng/m³ as per NAAQS 2009.	
	The concentration of Benzo(a)Pyrene were exceeding the norm of 1 ng/m³ at all the 6 locations.	
	The applicant was asked to investigate possible counter measures for the exceeding parameters.	

	In response to the draft report the applicant replied: "It appears that the deviation in the air quality norms was due to some one-off event. In any case, it was definitely not caused by ship recycling activity on the plot as all recycling activity ceased on 25th May upon completion of vessel SKS Trinity and the testing was carried put on 30th May. Furthermore, additional testing's subsequently have found the Nickel, Benzo Pyrene at BQ levels. Further testing has been done after completion of our previous vessel MV Clara Maersk and we are awaiting the results".	
Noise	Noise were measured at different locations and the noise level were within the permissible limits in most locations during the first round of sampling. In the area between winch 1 and 3 the measured noise exceeded the reference limits of 75 dB(A) a few times. For the second round of sampling, the permissible noise levels were exceeded at the main gate, near winch 2 and near winch 4.	Compliance was confirmed after the inspection.
Surrounding area	Monitoring of risks to the population in the vicinity of the ship recycling facility could not be located in the received documents. In the context of the Regulation, the BC TG guidelines on developing and implementing environmental management systems is a suitable international source relevant to Article 13(1)(d) as far as adverse effects on the environment are concerned.	Compliance was confirmed after the inspection.
	The applicant was asked to evaluate if their operation can influence the surrounding area, e.g if agricultural land is adjacent to the facility. If relevant, soil sampling should be conducted. Another way of monitoring risk to the population in the vicinity of the ship recycling facility is to sample fish.	
	In response to the draft report the applicant referred to Attachment 3 that includes a marine diversity study prepared by ABC Techno Labs India Private Limited. The marine diversity report contains four samples investigated for the presence of zooplankton and phytoplankton within 10km radius study area and in non-study area for comparison	

		purposes. The presence of zooplankton and phytoplankton was found adequate by ABC	
		Techno Labs India Private Limited.	
		Five samples of crab and one sample of fish was analysed for presence of heavy metals. The results were compared with limits in the Indian 'Food and Safety Standard Regulations (2011). According to the Food Safety and Standards Regulations no food shall contain any metal specified in excess of the limit (https://www.fssai.gov.in/home/fss-legislation/fss-regulations.html).	
		For the crab the analysis showed elevated levels of lead compared to the Food and Safety Standard Regulations (FSSR) limit of 0.5mg/kg for 4 out of 5 samples. These samples are not taken from this yard and there is no indication that this is due to the activities of this specific yard.	
		For the fish, the analysis did not show elevated levels compared to the FSSR limits.	
Technical guidance note 2.1.4 (b),	Health	Worker exposure and medical monitoring is addressed in chapter 3.4.11 of the SRFP and addressed in '7. Workers health monitoring and remediation plan' and found adequate. Please refer to row on medical monitoring below.	Compliance was confirmed during the inspection.
2.1.4 Technical guidance note 2.1.4 (b), MEPC 210(63) 3.1.1 (5), (7) and (8).	ISO certificates /management system/ QMS	The facility has the following ISO certificates: - ISO 9001: 2015 by valid up to 28.06.2021 - ISO 14001: 2015 by valid up to 28.06.2021 - OHSAS 45001: 2018 by valid up to 28.06.2021 - ISO 30000: 2009 by valid up to 27.06.2021 The facility has an implemented quality management system (QMS), managed by the Plot Manager with assistance of the HS Manager. The QMS system is however not mentioned in the SRFP. The relationship between the QMS and SRFP could be useful to include in the	Compliance was confirmed during the inspection.

		SRFP.	
		The QMS was subjected to an internal audit twice a year, in Management Review Meetings (MRM), involving all managers. In addition, Safety Committee meetings and Worker Committee meetings were held monthly, the latter with the participation of 4 elected worker representatives. Memos of these monthly meetings were witnessed and found in order, with actions, status and conclusions. There was also a complaint box, notes witnessed, input discussed during the meetings, implementing improvement accordingly. It was apparent that the QMS was a live system in use.	
		All supporting documents had a QMS document ID, with revision dates and revision numbers.	
		KPIs were witnessed and found to be followed up.	
		In response to the draft report, the applicant informed that the QMS has been revised in line with the SRFP. The improvements can be evaluated during a potential future site inspection.	
ILO SHG p21-23, p138:18.1, 18.3, p139:18.5	Workers facilities	The facility has its own no-cost dormitory complex, with capacity of 100 workers. Currently the complex was occupied by 90 workers. The facility was seen with a messroom, kitchen, toilets, recreation area with TV and seats	Compliance was confirmed during the inspection.
		for 24, drinking water plant and wash area.	
		The two drinking water plants (reverse osmosis), one in the main facility and one in the dormitory was periodically cleaned and tested by accredited company. The applicant was requested to provide reports of drinking water supply tested in accordance with Indian Public health requirements, including aerobic plate counts since the water is stored in	
		tanks. This was provided in response to the draft report (ref. Attachment 2a) and found adequate.	
		The kitchen area was equipped with 16 gas apparatus and 7 sinks. The workers use their	

own pots and pans.

There were toilets, showers and an outdoor washing area for laundry. There were 4 urinals, 2 sinks, 5 toilets and 5 showers. According to ILO Helpdesk Factsheet No. 6 Workers' housing' adequate sanitary facilities should include a minimum of one toilet, one wash basin and one tub or shower for every six persons. At the time of the inspection the ratio was 10 workers per (toilets/urinals). This is on the low side compared to the ILO factsheet, and even lower for sinks and showers. It is recommended that the applicant evaluate the need for further toilets, showers and sinks.

The rooms were furnished with beds and wardrobe lockers. The rooms were light and appeared clean. Evacuation signage and plans were posted, assembly sufficiently point marked.

Per the 'ILO Helpdesk Factsheet No. 6 Workers' housing', the workers' sleeping rooms floor area should not be less than 7.5 square metres in rooms accommodating two persons; 11.5 square metres in rooms accommodating three persons; or 14.5 square metres in rooms accommodating four persons. If a room accommodates more than four persons, the floor area should be at least 3.6 square metres per person. On-site it was observed that the applicant fulfils these requirements.

Article 13 (1) (e) it prepares a ship recycling facility plan

Technical	
guidance note	
2.1.2	

SRFP

During the site inspection the existing SRFP revision No.3, dated 28.09.2019, was reviewed and found not up to standard with respect to the intention of being a useful and practical instruction for the SRF. The SRFP should be revised with less general management content and more thought in way of step-by-step, chronological detail instruction on critical processes, clarity and consistency, writing instructions once, according to what is actually performed in the SRF's day-to-day operations.

In response to the draft inspection report the applicant submitted an updated SRFP (dated 24.02.2020) which has been reportedly revised to incorporate the above suggestions. The

Compliance was not confirmed during the inspection.

		revised sections concern the 'Ship recycling methodology' part of the SRFP (Section 2.6), including the sub-sections on 'Preparation before Cutting' (2.6.1), 'Dismantling Process' (2.6.2), 'Primary Cutting' (2.6.3), 'Pulling of the vessel during high tide' (2.6.4) and Secondary and Tertiary Cutting (2.6.5). The implementation of the updated procedures must be evaluated during a potential future site inspection before compliance can be concluded by the evaluators.	
MEPC 210(63) Section 3.1.1 (1)	Ownership	The SRF is privately owned by was acquired in 1999, whilst the JRD Industries have been in the ship recycling business since 1978.	Compliance was confirmed during the inspection.
MEPC 210(63) Section 3.1.1 (3), (4)	Facility organisation	 The SRF has a complete organisation, with good experience, covering all disciplines inhouse. Observations: The Human Resources (HR) role was distributed across several functions, which is considered unusual. There appeared to be a gap between the senior management and the recruitment of workers. The facility should review the suitability of their existing process. There are three Health and Safety (HS) Officers – It was not clearly defined as to their specific roles and how it ensured they are aligned between them. The previous HS Manager left the facility one month prior to the inspection 	Compliance was partly confirmed during the inspection.
		(reportedly due to family reasons). has taken on the role of HS Manager since this time on a temporary basis. A new HS Manager has recently started and is in a probation period. The new HS Manager is from the maritime industry, with auditor experience. The intention is that following the necessary inductions and familiarisations and successful probation period that will hand the full HS Manager responsibility to the new HS Manager. There appear to be several key positions, such as the "Labour Manager", who	

have an important role in the smooth running of the facility. It was not made clear how it was being ensured that the experience of these persons was transferred to others in a systematic manner – with respect to continuity planning in scenarios were these people were unavailable for whatever reason. The paramedic should be included in the relevant part of the organisational diagram. Partner / Company Incharge Plot Manager / Management Sales and Accounts Representative Manager Accountant Security Work and Ethics Yard Mukadum Ship Mukadum Environmental Officer HS Manager Electrician Manager Workshop Technician Welder Hazmat Team & Housekeeping HS Officer Field Supervisor Ship Gas Cutters Asst Supervisor / Master Supervisor Wire Rope Winch Operators Handlers Crane Operators Non Ferrous Crane Helpers Openers Gas Cutter Helpers / Begari Assistant HS Officer Yard Coordinator Wire Rope handlers Plate Handlers / loader Non - Ferrous Handler Non - Haz Waste Handler Emergency Team

		The conflict the control of the character of the characte	
		The applicant was requested to comment on the observations above.	
		In response to the draft report the applicant explained:	
		"We have revised the hiring procedure and recorded the same in the SRFP. Please refer to	
		SRFP Section 1.3.1 Worker induction and hiring process.	
		The three HS Officer was a specific requirement from our current ship owners.	
		The SRF shall have one HS Manager along with one HS Officer and one Asst. HS Officer.	
		They have been allotted their specific roles. Please see Section 1.1.2 Responsibilities and qualifications of the SRFP.	
		Any specific ship owner's requirement for additional HS Officers shall be fulfilled by hiring for that particular shipowner's project only.	
		The Paramedic currently is provided with the ambulance and is thus a subcontractor. We will therefore add this role to our organization chart once we have our own paramedic on the payroll. The Labour Manager has been added to the Org Chart at SRFP Section 1.1.1 Organizational Structure Roles and responsibilities added at SRFP Section 1.1.2 Responsibilities and qualifications"	
		The reported improvements and changes to the organisational structure must be evaluated during a potential future site inspection before compliance can be concluded by the evaluators.	
MEPC 210(63) Section 3.1.1 (4)	Roles and responsibilities	Roles and responsibilities were well specified in the SRFP and found to be as such during the site inspection too. Since the HS Manager position was in a period of transition, with a temporary organisational structure in place, this aspect could not be confirmed explicitly.	Compliance was partly confirmed during the
		In response to the draft report the applicant referred to section 1.1.1 and 1.1.2 of the revised SRFP.	inspection.

policies presented in Annex 1. General work, health & safety policy General work, health & safety policy for staff Roles and responsibilities policy Human resource policy Hiring employment / recruitment policy Wages and salaries policy Freedom of association policy	
- Non-discrimination policy - Equal employment opportunity policy - Child labour and young worker policy - Child labour remediation policy - Forced labour policy - Harassment and abuse policy - Anti-bribery and anti-corruption policy - Fair business and Anti-competitive behaviour policy - Whistle blower policy	Compliance was confirmed during the inspection.

	- Dormitory policy	
	- Disciplinary policy	
	- Work hours and overtime policy	
	- Environmental policy	
	- Vendor selection policy	
Working hour annual leave	All ship recycling plots are termed as a factory in India and therefore the Factories Act 1948 is applicable to them. In short:	Compliance was confirmed during
	 Workers can work in a factory for up to nine hours a day (excluding rest) and up to forty-eight hours in a week. 	the inspection.
	 Workers that work more than nine hours in any day or for more than forty-eight hours in any week are entitled to twice the ordinary rate of wage. 	
	- Total working hours including overtime shall not exceed 60 hours per week.	
	 Workers are generally entitled to at least 24 hours of weekly rest on Sunday. The weekly rest period is reckoned as paid time. 	
	 Workers required to work on weekly holiday are entitled to the substitute holiday three days before or after the usual weekly holiday. 	
	 Annual leave of 12 working days for all the workers who have worked at least 240 days in a year. An adult worker is entitled to one day of earned leave for every 20 days of service. Workers shall be paid their usual daily wage rates for the days of 	
	earned leave. A worker is entitled to full daily wages during the term of annual leave.	
DNV CL - Papart No. 2010-1221 Pay	- Workers are entitled to paid leave for Festival (public and religious) holidays. These include memorial holidays and religious holidays. There are many festival and	Page 25

religious holidays in India, three of which are fully covered national public holidays. These are Republic Day (January 26), Independence Day (August 15) and Mahatama Gandhi's Birthday (October 2).

The normal working day is 8hrs. Overtime working is commonplace depending on the workload.

Normal working hours are 08:00-17:00, with 1hour lunch break. In addition, there are reportedly two tea breaks of 30mins at 10:00 & 15:00.

Sundays are a non-working day, with no activity at the yard.

The evaluator's impression based on documentation presented on site, and through interviews with workers, was that the applicant ensures that the working hours are according to the Factories Act. The interviews were conducted with a sample of workers on-site, without the presence of supervisors and managers.

A random sample of wage records were sighted confirming the normal and overtime hours.

The records showed overtime was entitled to twice the ordinary hourly rate of pay. Reportedly the applicant had recently started paying this higher rate, upon request from a shipowner.

The applicant informed that workers are awarded 1 paid day leave for each 20 consecutive working days. Thus, 12 days leave for 240 working days (a working year). They had started with this arrangement in July 2019.

Records about paid leave for national holidays were witnessed on-site.

During the meeting with the Alang Sosiya Ship Recycling and General Workers' Association (ASSRGWA), which took place on the $11^{\rm th}$ of October 2019, where several workers were present, the Union representatives stated that none of the Alang shipbreaking yards comply with the relevant legal requirements regarding paid annual leave. This statement appears

		the evaluators requested respects the relevant leg	observed by the evaluato d a further written confir gal requirements concerr was forwarded in respon	mation from the a	pplicant that it fully eave.	,	
minir	imum wages,	Government Gazette, da for workers in the ship b minimum amount and o	range for ship recycling ated 21.02.2014, specify breaking industry in the Stranger of a special allowance, whether the minimum rates	ing the minimum State of Gujarat. I iich is adjusted ev	rates of wages per of t consists in a fixed ery six months.	-	Compliance was partly confirmed during the inspection.
		Classes of Employees	Basic Minimum Wages	Daily allowance	Total		
		Skilled	255	47.70	302.70		
		Semi-skilled	245	47.70	292.70		
		Unskilled	235	47.70	282.70		
		• • • • • • • • • • • • • • • • • • • •	ecords upon request sho m rates set out in the Gu	-	•		
		payslips showing that we	tnessed during the inspeorkers had received over nted (illiterate). Interview this.	time payment. Th	e records were sign	ned by	
		higher ranking in the org	rised that the Mukadams ganisation/pay structure, cant was requested to co	, which also entitle	ed them to benefits	such	

provide additional information to document this and explain how this is acceptable under the Factories Act.

In response to the draft report the applicant replied: "As of now the Mukadams have a fixed salary which is significantly higher than the cumulative wages receive by the highest paid skilled worker at the SRF. The SRF never deducts any salary at all in case any of the Mukadams has to casual /sick leave. Furthermore, we are now reviewing implementing issuing of contract terms for fixed salaried employees as record." However, the applicant did not provide documentation or explain how this is in compliance with the Factories Act. This would need to be investigated further during a potential future site inspection.

Sickness Benefits under the ESIC scheme entitles workers to 70% of the average daily wages during the period of certified sickness and is payable for 91 days during 2 consecutive benefit periods. To qualify for sickness benefit, the insured worker is required to contribute for 78 days in a contribution period of 6 months. Extended Sickness Benefit may be granted up to two years for 34 malignant and long-term diseases at an enhanced rate of 80 per cent of wages (https://www.esic.nic.in/extended-sickness-benefit).

Per ESIC, dependent benefits are paid at the rate of 90% of wage in the form of monthly payment to the dependants of a deceased insured person, in cases where death occurs due to employment injury or occupational hazards. The applicant provides ESIC (Employees' State Insurance Corporation) insurance. Payment of ESIC for August 2019 was witnessed on-site.

Workers sick e.g. with flue receives paid sick leave from the applicant when not covered by ESIC. Payrolls were spot checked on-site during the inspection and confirmed that workers had received payment while sick, starting from July 2019.

The facility has arranged additional insurance for their workers through The New India Assurance Co. ltd. The applicant informed that this would result in the pay-out of 300 000 INR in case of fatality, while in the case of disability the pay-out would be based upon an

	1		
		assessment. It was reported that the additional insurance cover is provided for up to 180 workers.	
		None of JRD Industries supervisors is a member of the Alang Sosiya Ship Recycling and General Workers' Association. Facility employees are reportedly free to join the association.	
		During the meeting with the Alang Sosiya Ship Recycling and General Workers' Association (ASSRGWA), which took place on the 11 th of October 2019, where several workers were presents, the Union representatives stated that none of the Alang shipbreaking yards comply with the relevant legal requirements regarding paid sick leave and overtime compensation. This statement appears to contradict what was observed by the evaluators on-site during the inspection. Therefore, the evaluators requested a written confirmation from the applicant that it fully respects all the relevant legal requirements concerning paid sick leave and overtime compensation.	
		In response to the draft report the applicant replied: `SRF confirms that we are complying to all labour laws. We have a certified Standing Order from the Factory inspector which may be verified at the time of visit'. This can be evaluated during a potential future site inspection.	
MEPC 210(63) Section 3.1.1 (7)	Instructions and procedures	Procedures were reportedly developed by the applicant and incorporated in the SRFP and the QMS. The site inspection proved that the facility in general and in practice had good procedures and instructions, also with informative photos.	Compliance was not confirmed during the inspection.
		However, considering the comments on the SRFP in this report, and the detail comments in each discipline, the procedures should be improved in presentation and detail, tidied up in the form of useful, practical instructions. In particular, the procedures for assurance and keeping overall track of processes, such as:	
		Detail instructions on cleaning and cutting in intertidal zone	
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- Overall, consolidated training plan and training monitoring
- Environmental monitoring plan and tracking
- Control of downstream waste final disposal, including loose materials, including electronic equipment and cables, removed from the vessel by contracted trader
- EPRP: Clear instructions on actions to be taken in case of emergency. Not a text-book

The essential issue is how the theoretical procedures are conveyed to the workers, in way of training and re-training. The yard's training program seemed well implemented but lacks clear oversight.

In response to the draft report the applicant replied:

"We have done a thorough review of our procedures and how they have been recorded in the SRFP. Surprisingly we have found that in some cases while the precise and clear procedures are in place and have been followed; however, their recording in the SRFP does suffer from the shortcomings as pointed out in the comments of this report. Accordingly, we have revised the SRFP procedures.

Furthermore, to ensure these procedures are regularly conveyed to the workers by way of re-training, specially for critical activities, the SRF, before the start of each such work (oil removal, cleaning of tanks, working in ER, DB cutting etc) has a process of revising the training to the workers involved in doing such work. During the recycling of MV Clara Maersk, we have held 1. 306 training sessions (Excluding worker training as per the training matrix) 2. 47 Mock drills for emergencies which included many such trainings that were given to the workers before their initiation of a particular work. We have now revised the SRFP to include instructions for providing such targeted trainings before the commencement of each such work."

The evaluators have taken good note of reported improvements and changes to the relevant instructions and procedures. The implementation of the updated procedures can

		be evaluated during a potential future site inspection.	
MEPC 210(63) Section 3.1.4	Project management progress reporting	Progress reporting is described in the SRFP. The HSE Team are responsible for progress reporting. The applicant demonstrated their records management system; including weekly progress reports on all vessels recycled since 2016. The facility does not operate with dedicated project managers, the management team with its supervisors manage the projects as needed. One vessel was under dismantling during the site inspection.	Compliance was confirmed during the inspection.
• •	(f): it prevents adversentertidal zones;	e effects on human health and the environment, including the demonstration of the control of a	any leakage, in
Technical guidance note 2.2, 2.2.1, p8: footnote (26), 2.2.2 (f), MEPC 210(63) Section 3.4.4.3/BC TG: p13: Table 1, p33:	Intertidal zone Control of leakage Preventive actions	The large tidal range, up to ca. 11 metres, means that for much of the tidal cycle the beached vessel is completely dry and resting on the shore. Critical procedures are how the facility prevents impact on the environment when dismantling and cutting in the inter-tidal zone, especially the double bottom. Hereunder	Compliance was partly confirmed during the inspection.

equipment was used, and what standards and criteria were applicable.

Sediment found in tanks on arrival is removed by subcontractors (Cherry Waste Management). Reportedly the sediments are tested for D2 elements and heavy metals like copper and Zinc. If the parameters are within permissible limits, the sediments are released to sea and records kept by the HSE team.

It was observed during the site inspection that hot cutting of pipes in the engine room had been performed. It was informed that this work was in connection with removal of asbestos, managed by the subcontractor (Cherry Waste Management) but with the applicant's workers performing the task. The facility advised that the procedure involved draining all pipes as much as possible, then using cold cutting to make ventilation in the pipe work before commencing hot cutting. This was claimed to be the common practice amongst the ship recycling facilities of Alang.

Residue from tank cleaning, performed by the applicant, is collected manually by brushes and scoops, put into bags and then sent to GEPIL.

A "tank cleaning plan" is referred to in the SRFP, however it was informed by the applicant that this is not a formal document. It is rather an agreement made in the planning meeting the day prior to the tank cleaning being performed.

A list of permits for gas freeing exists, but no overall log of gas freeing status could be provided. (Marking of gas freeing status at tank entry point is the primary control mechanism.)

In response to the draft report the applicant replied: "The SRF has added a process of recording the details of the Gas Freeing operations and the Gas Free Status at the entry point of each tank. The entire process of gas freeing of each tank is recorded by the HS Officer in the Confined space check and entry reports. The details of area, volume, mechanical ventilation carried out, surrounding area checks are a part of such record."

The evaluators also noted that the procedural steps for Tank Cleaning Operations (SRFP p54) would be more effectively represented by a flow-diagram. In addition, roles and responsibilities should be included – with use of diagrams and photographs to aid understanding. This is provided to some extent on SRFP p61 – however the sections should be at least referenced and ideally combined.

In response to this comment the applicant has prepared a flow diagram in section 2.6.1 of the revised SRFP (dated 24.02.2020).

The applicant's supervisors, "Mukadams", were interviewed in a group, separately from the Applicant's management team. They demonstrated much experience and clear understanding of the procedures of the ship recycling method.

It was explained that GMB, GPCB & DISH inspect the vessel prior to primary cutting, in order for authorisation to be granted.

The evaluators advised that the facility should instruct how they keep overall, high level track of which tanks are oily, which have been cleaned, which have been cleared and which have been cut. For example, by using the capacity plan. Also, it should be emphasized that engine spaces shall be finally cleaned after the removal of machinery parts and components for any spill occurred, and that barrier plates are erected on the sides of the engine spaces, if necessary, in order to prevent tidal water ingress.

In response to the draft report the applicant states: "the necessary revisions of the SRFP sections have been done. The SRF already has a process of creating artificial bulkheads inside and on the DB if required to prevent tidal ingress and egress of water. Please refer to SRFP Section 2.6.3.4 Cutting of Double Bottom."

The double bottom is cut by the slicing method, reportedly from watertight bulkhead to watertight bulkhead. If a complete length of a double bottom tank, from one watertight bulkhead to the next, cannot be removed within one low tide cycle, it will leave the double bottom awash at high tide unless the exposed openings in the non-watertight double

bottom floor are welded watertight. The evaluators advised that this method should be described in greater detail and included in the SRFP.

Reportedly, the DB cutting has been revised in the latest SRFP (dated 24.2.2020) section 2.6.3.4 Cutting of Double Bottom.

The double bottom is cut in the intertidal zone. At the time of the site inspection, the SRFP stated that slag and debris was captured on steel plates that have been placed in the intertidal zone as well as by using slag catchers. The methods employed for preventing impact to the environment during this phase were discussed during the site visit.

The facility has installed steel plating (remnants of formerly recycled ships) in the intertidal zone, this is acting as a quasi-impermeable floor – since there are both some small holes at several locations in the plates and a larger hole in the area under the keel of a vessel when centrally located on the plot. The evaluators observed that while these steel plates did provide an additional barrier and were considered a positive enhancement; however, they did not constitute an impermeable floor as defined by the EU Ship Recycling Regulation. On-site the applicant advised that they may consider how they could modify the steel plates in the intertidal zone to fully comply with the requirements.

The applicant further advised that slag catchers were used for all cutting of the double bottom. There is one step which is challenging in this regard which is the cutting of the keel area resting on the intertidal zone. It was informed that here the slag catchers are used as far as possible – then the steel plates provide additional safeguards and finally any slag encountering the sand is removed together with the sand until fresh sand is observed.

In response to the draft report the applicant informed: "The plates on the steel structure has been changed and the entire $18 \times 42 \text{ M}$ is now a smooth, double layered, completely impermeable structure with no holes whatsoever. Additionally, the SRF is installing a wedge at the edge of this steel structure which will enable lifting the keel, clear of the floor of this impermeable steel structure. The slag trays shall then be placed directly below the cutting

lines of the keel to completely capture all the slag and debris released during cutting the lines on the keel. The base steel structure will provide additional barrier in the unlikely event some slag or debris fall outside the slag trays. This base steel structure will regularly be swept clean. There is no contact with any sand whatsoever in the entire process now."

The evaluators also asked for a better, or more emphasized instruction in the SRFP on debris control, for example the stripping of interiors such as insulation etc. flying off the vessel on to the environment. This was only superficially mentioned in the SRFP at the time of the site inspection. The applicant has subsequently updated section 4.4.3. slag collection in response to this point.

The facility inspects and cleans the intertidal zone, and a debris log was reported to be maintained. The applicant was requested to provide a copy of the beach cleaning / debris collection log. This was forwarded in response to the draft report in Attachment 7a and 7b.

The state of the tide during the inspection did not permit inspection of the intertidal zone around the whole vessel. That which could be observed was seen to be clear for debris.

The effectiveness of tank cleaning, water tightness and slag collection can only be verified by inspections during actual operations, which was not possible during this site inspection. However, the facility described a thorough cleaning and inspection scheme, including inspections by the GPCB. It is understood that manual removal of sludge and sediment is performed initially. This is followed by high pressure water washing and chemical cleaning. The bi-product of this cleaning process is removed by pumping.

The evaluators need more evidence of final tank cleanliness and tightness in order to verify compliance, as any spill or high-tide wash of exposed double bottom tanks will not be caught in a drain line but end up in the environment.

In response to the draft report the applicant has initiated several measures as commented and referred to above. The improvements and new measures are welcome and their

Article 13 (1) (g) (i); the containment of all hazardous materials present on board during the entire ship recycling process so as to prevent any release of those materials into the environment; and in addition, the handling of hazardous materials, and of waste generated during the ship recycling process, only on impermeable floors with effective drainage systems; Technical guidance note 2.2.2, MEPC 210(63) Section 33.4.3 / BC TC: p78ff: 5.3, p67: figure 6 Technical guidance note 2.2.2, MEPC 210(63) Section p34: 3.4.4.1 Drainage The impermeable cutting areas were seen with curb stones, drainage and collecting tanks. It is a requirement that the handling of all hazardous material generated during the ship recycling process only shall be conducted on impermeable floors with effective drainage systems. The facility has recently redeveloped the secondary cutting zone, replacing steel plates with concrete. It was seen on site that as a result the effectiveness of the drainage provided for the secondary cutting area has been compromised. The drainage system consists of hollow pipe fenders with drain slots cut out, these are covered by a light gauze to prevent debris entering the drain. The deficiencies noted were that the height difference between the top of the concrete and the top of the pipes was almost non-existent in some areas, and that the number and size of the drain slots did not seem sufficient to cope with the possible volumes of rain that may be expected. The facility was asked to review the drainage system arrangement, perform calculations to demonstrate the capacity of the systems and incorporate any modifications found to be necessary.				
of those materials into the environment; and in addition, the handling of hazardous materials, and of waste generated during the ship recycling process, only on impermeable floors with effective drainage systems; Technical guidance note 2.2.2, MEPC 2.10(63) Section 3.3.4.3 / BC TG: p78ff: 5.3, p67: figure 6 Technical guidance note 2.2.2, MEPC 2.10(63) Section 3.3.4.3 / BC TG: p78ff: 5.3, p67: figure 6 Technical guidance note 2.2.2, MEPC 2.10(63) Section 3.3.4.4.1 Drainage The impermeable cutting areas were seen with curb stones, drainage and collecting tanks. It is a requirement that the handling of all hazardous material generated during the ship recycling process only shall be conducted on impermeable floors with effective drainage systems. The facility has recently redeveloped the secondary cutting zone, replacing steel plates with concrete. It was seen on site that as a result the effectiveness of the drainage provided for the secondary cutting area has been compromised. The drainage system consists of hollow pipe fenders with drain slots cut out, these are covered by a light gauze to prevent debris entering the drain. The deficiencies noted were that the height difference between the top of the concrete and the top of the pipes was almost non-existent in some areas, and that the number and size of the drain slots did not seem sufficient to cope with the possible volumes of rain that may be expected. The facility was asked to review the drainage system arrangement, perform calculations to demonstrate the capacity of the systems and			effectiveness can be evaluated during a potential future site inspection.	
Technical guidance note 2.2.2, MPC 210(s3) Section p34: 3.4.4.1 Drainage The impermeable cutting areas were seen with curb stones, drainage and collecting tanks. It is a requirement that the handling of all hazardous material generated during the ship recycling process only shall be conducted on impermeable floors with effective drainage system consists of hollow pipe fenders with drain slots cut out, these are covered by a light gauze to prevent debris entering the drain. The deficiencies noted were that the height difference between the top of the concrete and the top of the drain slots did not seem sufficient to cope with the possible volumes of rain that may be expected. The facility was asked to review the drainage systems and	of those mate	erials into the enviro	onment; and in addition, the handling of hazardous materials, and of waste generated during the	•
Drainage The impermeable cutting areas were seen with curb stones, drainage and collecting tanks. It is a requirement that the handling of all hazardous material generated during the ship recycling process only shall be conducted on impermeable floors with effective drainage systems. The facility has recently redeveloped the secondary cutting zone, replacing steel plates with concrete. It was seen on site that as a result the effectiveness of the drainage provided for the secondary cutting area has been compromised. The drainage system consists of hollow pipe fenders with drain slots cut out, these are covered by a light gauze to prevent debris entering the drain. The deficiencies noted were that the height difference between the top of the concrete and the top of the pipes was almost non-existent in some areas, and that the number and size of the drain slots did not seem sufficient to cope with the possible volumes of rain that may be expected. The facility was asked to review the drainage system arrangement, perform calculations to demonstrate the capacity of the systems and	Technical guidance note 2.2.2, MEPC 210(63) Section 3.3.4.3 / BC TG: p78ff: 5.3, p67:	1	The facility was seen with impermeable concrete flooring partly covered in steel sheets, with surrounding curbs and drains. In general, the facility was found in tidy, swept and	confirmed during
The facility advised that the drainage system in the areas would be revised to ensure adequate drainage was provided. No documentation was provided to demonstrate the effectiveness of the current drainage	guidance note 2.2.2, MEPC210(63) Section p34:	Drainage	It is a requirement that the handling of all hazardous material generated during the ship recycling process only shall be conducted on impermeable floors with effective drainage systems. The facility has recently redeveloped the secondary cutting zone, replacing steel plates with concrete. It was seen on site that as a result the effectiveness of the drainage provided for the secondary cutting area has been compromised. The drainage system consists of hollow pipe fenders with drain slots cut out, these are covered by a light gauze to prevent debris entering the drain. The deficiencies noted were that the height difference between the top of the concrete and the top of the pipes was almost non-existent in some areas, and that the number and size of the drain slots did not seem sufficient to cope with the possible volumes of rain that may be expected. The facility was asked to review the drainage system arrangement, perform calculations to demonstrate the capacity of the systems and incorporate any modifications found to be necessary. The facility advised that the drainage system in the areas would be revised to ensure adequate drainage was provided.	partly confirmed during the

		system design. Such documentation is expected to consider aspects including meteorological data, possible volumes of spills, types of spills, area of impermeable floor per drain, design of drainage intake and ingress of external waters. In response to the comments above, the facility has reportedly welded pipes to increase the height of the barrier which is sufficient as per the facility's calculations and they have also increased the number of drain slots from 3 to 5. Photographic evidence of these improvements were submitted as part of the replies to the draft report, together with additional documentation in attachment 8. The reported improvements are welcome and their effectiveness can be evaluated during a potential future site inspection.	
Technical guidance note 2.2.	Wastewater treatment plant	The drain water is stored in tanks on-site. GEPIL then empty these and transport to their facility for processing. It was commented by the applicant that GEPIL has one truck to cover the whole of Alang-Sosiya. It was not clear how GEPIL could service all SRFs in periods of high rainfall. Reportedly 36 000 litres will accumulate over approximately 2,5 days during the monsoon. The applicant was asked to provide further information in this respect. In response to the draft report the applicant replied:	Compliance was partly confirmed during the inspection.
		"The SRF has a capacity to collect and store 36000 ltrs of rain water. In case of persistent rainfall and the rainwater tanks getting filled, 1. SRF can transfer the water from the tanks to the vessel double bottom tanks as interim storage till the time the same can be transferred to GEPIL for processing. 2. As an added fall back SRF has entered into an agreement with Jay Bhavani Transport to provide tankers for additional storage and transport to GEPIL if needed. Copy of the agreement is enclosed as Attachment 11."	

		The evaluators question if option 2 is a realistic option. During a meeting with GEPIL in January 2020 it was stated that only GEPIL trucks are allowed to deliver stormwater to their premises. The GEPIL truck has a capacity of 5000 litres and is the only truck allowed to collect bilge, oily water, ballast water and stormwater on behalf of GEPIL. In a meeting with GEPIL in January 2020 it was also explained that only a small number of recycling yards request collection of stormwater by GEPIL. It was understood that the applicant is not among these facilities. The applicant is requested to ensure that stormwater is handled in an environmentally sound manner. If stormwater is released to sea, the applicant must ensure that the water quality is within Indian standards. For example, sedimentation may be beneficial. However, to evaluate the effectiveness, water testing must be performed by an accredited laboratory with adequate detection limits.	
	Impermeable floors	The impermeable concrete floors were seen intact and solid. The secondary cutting area had steel plates (with raised bumps) to aid safe steel cutting.	Compliance was confirmed during the inspection.
Technical guidance note 2.1.4, 2.2.2, 2.2.3, 2.2.5, 3.5, MEPC 210(63) Section 3.4.2.5 / BC TG 3.1, 3.3, 3.4.3, 4.1, 5.1, 5.2(Zone D), 5.3(Zone D), p92: Table 11	Waste storage	Waste storage rooms for glass wool, plastics, chemicals, paint chips and batteries respectively, were inspected and found suitable, very clean, but empty.	Compliance was confirmed during the inspection.
Technical guidance note 2.1.4, 2.2.2, 2.2.3, 2.2.5, 3.6, MEPC 210(63) Section 3.4.3/ BC	Hazardous waste storage	Waste storage rooms for asbestos, PCB, HBCDD, chemicals, paint chips and batteries respectively, were inspected and found suitable, very clean, but empty.	Compliance was confirmed during the inspection.

TG 3.1, 3.3, 3.4.3,
4.1, 5.1, 5.2
(Zone D), 5.3
(Zone D), p92,
Table 11

Article 13 (1) (g) (ii): that all waste generated from the ship recycling activity and their quantities are documented and are only transferred to waste management facilities, including waste recycling facilities, authorised to deal with their treatment without endangering human health and in an environmentally sound manner;

Technical
guidance note
2.1.4, 2.2.2,
2.2.3, 2.2.5, 3.5,
MEPC 210(63)
Section 3.4.2,
3.4.3/ BC TG p11,
p12, p48ff: 41,
p50ff: 4.2,

Waste management

It is a requirement that all wastes generated from the ship recycling activity are properly documented. The 2016 Technical Guidance clarifies this further in section 2.2.2, where it is written: All elements separated from the ship, including large blocks, constitute either 'hazardous materials' or 'waste generated during the ship recycling process'.

Most materials and equipment, lose or fixed, is removed and sold. This is problematic as the applicant until recently, has not sampled these materials to ensure that the materials are free from hazardous waste.

The quality of the IHMs varies. Some IHM relies only on documents and no samples, some IHM relies on samples but only for substances listed in Annex I, while other IHMs include samples for both Annex I and II. This means that the ship recycling facility must have additional measures to identify hazardous materials other than those possibly listed in the IHM.

This is notably the case for Persistent Organic Pollutants. The list of POPs included in the Stockholm Convention is available here:

http://chm.pops.int/TheConvention/ThePOPs/AllPOPs/tabid/2509/Default.aspx

Specific information on the production and use of these compounds can be found under the Persistent Organic Pollutants Review Committee documents (http://www.pops.int/Convention/POPsReviewCommittee/Chemicals/tabid/243/Default.aspx)

Compliance was partly confirmed during the inspection.

The applicant had until recently mainly relied on the IHM, and the vessel present during the inspection is the first vessel where the applicant has conducted additional sampling.

Hazardous materials described in the IHM is removed and sent to waste management facilities authorised by GPCB. At the time of inspection, the applicant had never removed any waste containing PCB, PBB, PBDE, PFOS, SCCP, PCN or HBCDD.

After the inspection the applicant forwarded the report 'Gap Analysis Clara Maersk', which described the additional samples. The additional samples and the reporting was conducted by a third-party company, trained in hazardous materials. 17 additional samples were taken and analysed for parameters relevant to the indicative list in the IMO Resolution MEPC.269(68) and the EMSA Guidance on IHM.

PCB, PBB, PBDE, SCCP, 1,2,3,4- tetrachloronaphthalene and octochloronaphtalene, cadmium, chromium, lead, mercury and ODS samples were analysed at AES laboratories (P) ltd. PFOS, mercury, lead, hexavalent Chromium and HBCDD samples were analysed at SGS India Pvt. Ltd.

The evaluators could not find the accreditation for these analysis in the scope of accreditation from NABL for these laboratories. The applicant was therefore requested to discuss with the laboratories and to point to where in the scope of accreditation these laboratories are accredited to analyse these parameters.

In this respect, the evaluators also referred to the EMSA guideline on IHM, which provides that "Anyone using a laboratory for the analysis of samples for HM included in the Annex II of the Regulation is responsible to confirm that the laboratory is suitably accredited."

In response to the draft report, the applicant forwarded copies of the NABL accreditation of the two laboratories (AES and SGS) referred to above and committed to getting all sample testings done from accredited labs.

During the site visit it was also established that equipment containing mercury had been

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		sold to third parties. Such equipment includes gyros and florescent light bulbs. Under chapter 2 of the Hazardous And Other Wastes (Management and Transboundary Movement) Rules, 2016, it is written: 'The hazardous and other wastes generated in the establishment of an occupier shall be sent or sold to an authorised actual user or shall be disposed of in an authorised disposal facility'. The evaluators' understanding on-site was that the Mercury containing equipment had been sold to a third party for re-use, not to an authorised actual user or to a disposal facility. The applicant was requested to comment on this. In response to the draft report, the applicant replied: "the SRF has henceforth decided to discontinue selling any item containing mercury, even for re use to an actual user. Accordingly, we have made the necessary amendments to SRFP (see section 4.3.9)." The reported improvements and new procedures are welcome, and their implementation	
		can be evaluated during a potential future site inspection.	
Technical guidance note 2.1.4, 2.2.2, 2.2.3, 2.2.5, 3.6, MEPC 210(63) Section 3.4.2, 3.4.3/ BC TG p11, p45ff: 7. / 4.2	Waste disposal	Please refer to Article 15(5) below.	Compliance was partly confirmed after the inspection.
	- ' - '-	maintain an emergency preparedness and response plan; ensures rapid access for emergency r	•
Technical	ich as nre-ngnung equ	ipment and vehicles, ambulances and cranes, to the ship and all areas of the ship recycling fac	iiity;
guidance note	Emergency	At the time of the site inspection, the EPRP was explained in the SRFP (Sec.5, page 122),	Compliance was
2.1.3, MEPC 210(63) Section 3.3.5/ BC TG p3, p5/6, p47, p56, p63/64/65/66/67 , p70, p81, p83,	preparedness plan	with the document itself, dated 01.07.2019, being provided as an attachment to the SRFP. The evaluators interviewed provided as an attachment to the SRFP. The evaluators interviewed provided as an attachment to the SRFP. The evaluators interviewed provided as an attachment to the SRFP. The evaluators interviewed provided as an attachment to the SRFP. The evaluators interviewed provided as an attachment to the SRFP. The evaluators interviewed provided as an attachment to the SRFP. The evaluators interviewed provided as an attachment to the SRFP. The evaluators interviewed provided as an attachment to the SRFP. The evaluators interviewed provided as an attachment to the SRFP. The evaluators interviewed provided as an attachment to the SRFP. The evaluators interviewed provided as an attachment to the SRFP. The evaluators interviewed provided as an attachment to the SRFP. The evaluators interviewed provided as an attachment to the SRFP. The evaluators interviewed provided as an attachment to the SRFP. The evaluators interviewed provided as an attachment to the SRFP. The evaluators interviewed provided as an attachment to the SRFP. The evaluators interviewed provided as an attachment to the SRFP. The evaluators interviewed provided as an attachment to the SRFP. The evaluators interviewed provided as an attachment to the SRFP. The evaluators interviewed provided as an attachment to the SRFP. The evaluators interviewed provided as an attachment to the SRFP. The evaluators interviewed provided as an attachment to the SRFP. The evaluators interviewed provided as an attachment to the SRFP. The evaluators interviewed provided as an attachment to the SRFP. The evaluators interviewed provided as an attachment to the SRFP. The evaluators interviewed provided as an attachment to the SRFP. The evaluators interviewed provided as an attachment to the SRFP. The evaluators interviewed provided as an attachment to the SRFP. The evaluators interviewed provided as a supplication to the SRFP. The evaluato	not confirmed during the inspection.
	No. 2010-1221 Poy 0 - www	document. It was recommended that the fleatin & Safety Officers be included in the	Page 41

p87, p89/ ILO SHG p32: 4.6, p		maintenance of the EPRP to ensure that the plan can be effectively utilised.	
49: 7.1.8, p 128:16.		The EPRP in force at the time of the site inspection was found to be written on a management level, not as an instruction for the workers on the plot.	
		The EPRP depicted 11 emergency scenarios. The evaluators observed that the scenario of "Medical evacuation in case of injury" should be sub-divided to address more specific scenarios (e.g. falling from height, rescue from confined space, electric shock etc.)	
		It was also seen that Muster lists were only established for a selection of the scenarios. Hence it was recommended that Muster lists be established for all scenarios.	
		It is essential that the EPRP conveys the academic information to the workers in way of training. The evaluators advised that the EPRP should be tidied up to include a step by step, useable and practical response instructions, in standard letter formatting, with line- and paragraph spacing so it can be clearly read.	
		The site inspection found that there was no training material available other than for Basic First Aid. It would be expected to have training for specific scenarios (e.g. falling from height, rescue from confined space, electric shock etc.)	
		It was also found that in the Emergency contact list there were instances where several numbers had been included for a single contact. In these cases, each number should be preceded with advice on which scenario each number is to be used.	
		In response to the draft report, the applicant submitted a revised EPRP in Attachment 14. The new documentation is appreciated, and its implementation can be evaluated during a potential future site inspection.	
Technical guidance not 2.2.4, MEPC 210(63) Section 3.2.1	Emergency access routes	The site inspection proved that the facility had clear and amply marked emergency access and evacuation routes, marked as yellow lines. An assembly station was clearly marked, both on site and on the facility plan. Signage was found very good, including marking / zebra painting (yellow/black) of thresholds, dangerous areas and limits of storage / work	Compliance was confirmed during the inspection.

		areas.	
		Access from the facility to the intertidal zone was either over the edge of the built structure or by way of the ramp to the east of the plot.	
MEPC 210(63) Section 3.2.1	Access and logistics within facility,	Access to the ship, and within the facility for ambulances and fire trucks was found to be good and well-marked. It was queried though how ambulances and fire trucks would access the ship when the mobile cranes are occupying the "crane movement zones" either side of the centrally located Cutting Zone Area 2 – given the time needed to move the cranes or if the cranes could not be moved for some reason. It was recommended that this scenario be given due consideration, and procedures be developed to address it. In response to the draft report, the applicant explains: "The SRF has marked dedicated emergency passage way for movement of Fire Brigade or Ambulance. The Crane drivers and helpers have been trained to park cranes leaving the passage for emergency vehicles clear at all times." This point can be re-evaluated during a potential future site inspection.	Compliance was partly confirmed during the inspection.
Technical guidelines 2.1.4 (b), MEPC 210(63) Section 3.2.1, 3.3.5, ILO SHG, Section 3.6	Medical services and facilities	The SRF had a medical services scheme, including worker health monitoring and an equipped doctor's office / first aid room. A paramedic was present during the site inspection but was not included in the organisation chart or the table of subcontractors. The applicant was asked to advise details of the contractual relationship with the paramedic, and their place in the organisation. In response to the draft report, the facility clarified: "the Paramedic currently is provided with the ambulance and is thus a subcontractor. We will therefore add this role to our organization chart once we have our own paramedic on the payroll. While that the paramedic has been included in the EPRP in emergency response actions."	Compliance was partly confirmed during the inspection.

The applicant had an ICU equipped ambulance and driver on site.

First aid kits were seen at the facility, generally found to be well equipped and in good order.

In the context of the site inspection, the evaluators also visited the new GMB Multi Speciality hospital in Alang, which was seen in operation. However, this hospital has only limited emergency capability even though surgical equipment, including an operating theatre is available. According to the doctor's schedule obtained from the GMB hospital on the 14th of October 2019, a surgeon is only available on Sundays for planned surgery from 09:00 -17:00 and Fridays from 14:00-17:00. Outside of these hours, and in case MRI or CTI is required, an injured worker would need be sent to Bhavnagar, approximately 1.5 hours' drive away. Discussions with the Workers Union also confirmed that this hospital has inadequate capacity for the whole Alang workforce and lack of capacity to treat serious injuries.

The GMB expressed, during the meeting in Gandhinagar on the 9th of October 2019, that the GMB hospital would be further expanded and that the numbers of doctors would increase. When this is expected to happen is not clear to the evaluators.

As noted above, the facility has an ambulance and a paramedic on site. Although this is welcome, it does not fully mitigate the situation should a serious injury occur requiring hospital facilities, and even in case of multiple injuries. The closest public hospital facility is in the city of Bhavnagar, which is approximately 1.5 hours' drive away on a substandard, high traffic main road.

In this context, it is further noted that the absence of hospital facilities equipped to treat severe injuries in Alang has been a longstanding problem. Geetanjoy Sahu reports in the article 'Workers of Alang-Sosiya A Survey of Working Conditions in a Ship-Breaking Yard, 1983-2013' (https://www.epw.in/journal/2014/50/special-articles/workers-alang-sosiya.html) that the inadequate health facilities at Alang have been raised and discussed

in various forums, ranging from the Supreme Court to the Inter-Ministerial Meeting in India, but has not been resolved.

In response to the draft report, the applicant provided further useful information regarding ongoing efforts to improve the local hospital situation. The applicant reported that "The existing facilities at the GMB hospital are continually being upgraded and is now equipped with an ICU and a Burn Unit. The Hospital has tie-ups with Specialty Surgeon from Bhavnagar whoare available on call from Bhavnagar."

Moreover, it was reported that the applicant is working on further upgradation of existing health care facilities in Alang, together with other ship recycling facilities. In this respect, it is understood that a GAP assessment of existing medical facilities (Alang and GMB Hospital) against international/national standards has been organized by medical consultants (Critical Care specialist) and resulted in concrete recommendations for improvements. Reportedly, "The SRF is spearheading an initiative to invest in upgrading the facilities at Alang Hospital in consultation with the above Critical Care specialist in order to upgrade facilities available to level that most injuries are completely treated at Alang and the few critical patients are adequately stabilized and then sent to specialty hospitals without increasing risk to them." The applicant further explained that "Medical staff trained in trauma care would be available in hospitals. As per the plan, Hospitals in Alang will have tie ups with Tertiary hospitals in Bhavnagar and Ahmadabad for training and support in case of emergency."

The evaluators welcome all the above measures and acknowledge the efforts of the applicant to improve the hospital situation in Alang. However, the evaluators have not seen the actual GAP analysis referred to by the applicant and the resulting recommendations. Furthermore, in the absence of a concrete implementation action plan for the said recommendations, including timeframes and information on the availability of the necessary human and budgetary resources, the prospect of achieving the desired improvements remains unclear to the evaluators.

Technical Regulatory

By checking of records, the evaluators deemed the facility to comply with regulatory health

Compliance was

guidelines 2.1.4 (b), MEPC.210(63), Section 3.3.1, 3.3.4.11	requirements health and safety	and safety requirements. In this context, it is further noted that safety officers appointed by the GMB reportedly "inspects yards on a daily basis and keep a close watch on ship recycling activities and if any violation is observed at plot during ship recycling, a penalty of Rs. 10,000 is levied by GMB and plot activities are also suspended (For 2 to 3 days) in some of the cases and they are only restarted after compliance." The evaluators are unaware that the applicant would have received any penalties for non-compliance with regulatory health and safety requirements. Reportedly, in the six last years, GMB has not suspended their plot activities. It should be also noted that Comptroller and Auditor General of India released a report in August 2018 (https://saiindia.gov.in/sites/default/files/audit report files/Report No 4 of 2018 - General and Social Sector Government of Gujarat.pdf) indicating that safety inspections in Alang carried out by the Directorate of Industrial Safety and Health (DISH) over in a three-year period (between March 2014 and March 2017) were grossly below target and have failed to achieve the desired result and act as deterrence to non-compliance of the provisions of the Factories Act relating to safety, health and welfare of workers thereby leading to accidents.	confirmed during the inspection.
MEPC.210(63), Section 3.1.1	Regulatory requirements fire	The facility's fire safety regime including prevention and mitigation was deemed to be good, and in accordance with regulatory requirements.	Compliance was confirmed during the inspection.
Article 13 (1) use;	(i) it provides for work	ker safety and training, including ensuring the use of personal protective equipment for operati	ons requiring such
Technical guidance note 2.3.1	Safety inspectors on site	The colour of the helmet is based on the position. The HS management (manager + 3 officers) were identifiable on the premises wearing white helmets. The management and visitors do also wear white helmets. Other colour codes are blue, red and yellow. The	Compliance was confirmed during the inspection.

		emergency team bear stickers of fire fighter and first aider on their helmets.	
Technical guidance note 2.3.2	Condition of safety equipment	In general, the standard and condition of the safety equipment was good and kept in storerooms and chests. Suitable rescue equipment, including stretchers, lifebuoys, fire equipment chests and cages for evacuation of injured personnel, was kept readily available. The rescue boat was found in good condition. It takes at least 8 minutes to deploy the	Compliance was confirmed during the inspection.
		rescue boat by crane. No documentation was seen showing how often the rescue boat was tested – either in its own right or as part of a drill. The applicant was asked to provide such details.	
		In response to the draft report the applicant replied: "The SRF maintains a monthly checklist log of HS Dept for maintenance of Rescue boat. Find annexed copy of checklist as attachment 15. Since the installation of Rescue boat, the SRF has conducted 4 nos of mock drills with rescue boat being a part for it. Find report of the last mock drill performed including photographs annexed as Attachment 16 – Mock Drill Report – Man overboard at Sea."	
		During the site inspection, two first aid kits were identified; one on board the vessel and one in the safety equipment room. Both kits were quite dirty and included e.g. used bandages and garbage. It is important that the facility have first aid kits that include the necessary equipment and that they remember to refill if something is being used, as well as keep them clean.	
Technical guidance note 2.3.3, MEPC 210(63) Section 3.1.2/3.2.2	Safety induction and training, employees	The facility has an implemented safety induction training and re-training scheme for new and current employees.	Compliance was confirmed during the inspection.
Technical guidance note	Safety induction	The SRFP contains a table giving an overview of training modules required by each job	Compliance was

2.3.3, MEPC 210(63) Section 3.1.2/3.2.2	and training, subcontractors	description, as well as a PPE Matrix included in the SRFP, which gives an overview of what type of PPE is required for type of work being carried out. Same as the workers, the subcontractors are included in both tables. The training module given to the subcontractor depends on the type of work they provide.	confirmed during the inspection.
Technical guidance note 2.3.3, MEPC 210(63) Section 3.1.2/3.2.2	Safety induction, visitors	The evaluators were subjected to safety induction on arrival the first day and provided with PPE for the site inspection. The PPE consisted of safety shoes, helmet, high visibility vest, safety glasses, dust mask and gloves.	Compliance was confirmed during the inspection.
Technical guidance note 2.3.3, MEPC 210(63) Section 3.1.2/3.2.2	Risk Assessment	The facility had carried out a risk assessment of their operations, found acceptable. Risk assessments were reported to be a part of their working practice. A sample risk assessment is provided in Annex 4 of the SRFP application file. The level of English language in this document is much higher than in the SRFP in general and has reportedly been prepared by the HSE team.	Compliance was confirmed during the inspection.
MEPC 210(63) Section 3.1.2	Hazardous waste handling training	The hazmat workers have been trained both externally and internally. The facility has sent 3 workers from its own yard and 4 workers from Cherry Waste Management (appointed by SRIA to remove asbestos) to an external course in Mumbai about removal of asbestos. Records of participation were witnessed on-site. The applicant had sent 15 workers to an advanced inventory of hazardous materials course. Records were witnessed on site.	Compliance was confirmed during the inspection.
MEPC 210(63) Section 3.3.5	Ship access control	The facility has a Management Information System (MIS), which they showed during the site inspection. A description of the MIS is provided on page 38 in the SRFP. The facility uses a QR code scanning system that is connected to the MIS to keep track of the persons on board. Each worker has a unique QR code on its ID card, which is scanned when the worker enters/leaves the vessel. That way the management may see how many people that are on board.	Compliance was confirmed during the inspection.

		The facility has implemented a QR-code card-based access control system. Each worker's card has a unique QR-code, this is scanned using a mobile phone. The access register is available directly on the facility's ERP system. Visitors cards have QR-codes too but need to be cross-referenced to the Visitor Log to establish visitor's name. There are positives and negatives associated with such a system, a negative is that an online system must be queried to see who/how many persons are onboard. A physical card system provides this information for all to see. The applicant was requested to describe how ship access control is maintained with loss of mobile data network, and what redundancy exists in the system. Reportedly, the facility has two dedicated mobile phones having dual sim cards to maintain loss of mobile data. Additionally, a manual register is kept with the concerned supervisor to record access control on vessel, in case there is no access to the control system.	
MEPC 210(63) Section 3.3.4.5	Prevention of falling from heights	Training was in force, records of training were witnessed on site. Warning tape was seen to be used on guard rails where risk of fall may be expected. Temporary barriers were also seen to be utilised in other areas. Safety harnesses were seen in the PPE room.	Compliance was confirmed during the inspection.
MEPC 210(63) Section 3.3.4.1.8	Safety signage on site	Safety signage was found to be well located and presented.	Compliance was confirmed during the inspection.
MEPC 210(63) Section 3.3.4.1.8	Safety signage on vessel	Safety signage was mostly found to be good. There was though some confusion regarding the use of the skull and crossbones signage which has been used as a general danger warning. In response to the draft report the applicant replied: "The SRF trains all workers through the basic safety training regarding the safety signages. The SRF found it useful to relate the skull and cross bones signage as a sign of DANGER to the workers. The workers are clear that they cannot enter that area displaying this sign without permission or authority from	Compliance was confirmed after the site inspection.

		the HS team and that work near to that area has to be done under strict supervision. Additionally, we are also using signages in local language and pictorials. Our workers are trained on the signages at the time of induction as a general process." The evaluators find the response acceptable. Normally, it would be assumed that all areas were unsafe unless a Safe-for-entry certificate was shown at the entry point. There is a risk that workers only follow the skull and crossbones signs and assume everything else is okay. Reportedly, training is performed to clarify this point.	
MEPC 210(63) Section 3.3.4.6	Lifting equipment and instructions Cranes	 Pulling winches Inspected and tested by an independent competent person (Safetech) – 6-month cycle employed. Daily (responsible, Mukadam), weekly (responsible. Safety Officer), monthly (responsible, Safety Officer) and 6 monthly (resp. Safety Officer) inspections were said to be performed. The procedure for doing so was presented. Wires The pulling wires were sighted coiled in the vicinity of the winches. These had been oiled/greased on external faces. The wires were numbered simply, e.g. "WR 3". Several flat areas were however observed on the wires. During routine examination the extent of flattening is evaluated by the person performing the examination. The facility was asked to advise how this evaluation is controlled. Spot checks found that the wires were part of the inspection by Safetech. Wire ropes are checked monthly. A checklist is used and stamped and signed by a Safety Officer. Upon inspection of the monthly inspection records it was found that items were always "checked-ok". The explanation provided for this was that if during the inspection items were found to be "not ok" then they would be changed out immediately, then the 	Compliance was partly confirmed during the inspection.

inspection checklist would be "checked-ok". It was commented by the evaluators that this did not provide traceability and non-conformance tracking. It was recommended to document when items did not satisfy the inspection criteria and state the remedial actions taken.

Cranes

Maintenance schedules, records, tests and certificates for the main cranes were sighted. They were found well organised. Independent inspection and testing is performed by a reportedly competent organisation (Safetech) – with a 6 monthly cycle employed.

Sheave blocks

Were found to be regularly inspected.

<u>Lifting slings and Shackles</u>

Shown to be checked monthly. A comprehensive monthly checklist system was found to be in use. It was found however that the checklist was completed in the office after the actual inspection on site by experienced persons with notes made in a notebook/paper – as they wanted the final document to be clean. It was mentioned by the evaluators that this could result in items being overlooked, and that it would be more effective to use the checklist actively when performing the inspection.

General

It was found that the history of the equipment was not known, e.g. how old the equipment was, or when it was first used at the facility.

In response to the draft report the applicant replied that they have initiated several measures to follow up on the points identified by the evaluators during the inspection:

 Reportedly, the checklist has been amended to record parameters of evaluation of the extent of flattening of the wire. The person doing the evaluation will follow

		 these parameters and record the result in the revised monthly checklist. The HS team now reportedly maintains a Log register of defects for all equipment's. The corrective action taken is also noted in this record. Non-Conformance form is reportedly being maintained, if the corrective action has not been implemented. The new measures are welcome, and their implementation can be verified during a potential future site inspection. 	
MEPC 210(63) Section 3.3.4.6	Crane operators' certification	Crane operators were trained and certified. Relevant documents were witnessed during the inspection and found in order.	Compliance was confirmed during the inspection.
Directive 2006/42/EC	Lifting equipment, authorization	Found to be adequate.	Compliance was confirmed during the inspection.
MEPC 210(63) Section 3.1.2	Training of forklift operator	N/A	N/A
MEPC 210(63) Section 3.1.2	Certification/trainin g of cutters	The cutters are trained by GMB over a period of 15 days. Only workers certified by GMB can work as cutters.	Compliance was confirmed during the inspection.
MEPC 210(63) 3.4.3	Cutting procedures	The cutting procedures were found adequate.	Compliance was confirmed during the inspection.
MEPC 210(63) Section 3.3.4.3 / ILO SHG:	Steel cutting machines	The cutters use 3-way torches with flashback arrestors.	Compliance was confirmed during

p108ff:13.			the inspection.
ILO SHG: p67:7.2.4.4, p108ff:13.	Winches, mooring gear.	The pulling winches were identifiable in the facility's records, tested and certified by a third party (Safetech) on a 6-monthly basis.	Compliance was confirmed during the inspection.
MEPC 210(63) Section 3.3.4.6.	Ropes/chains/ slings	The records for testing and certification of chains, shackles, wire ropes, pulleys and slings were witnessed and found in order. They are inspected on a 6-montly basis by an independent third party. All equipment was found marked and traceable.	Compliance was confirmed during the inspection.
MEPC 210(63) Section 3.3.4.8	Maintenance and decontamination of tools and equipment	A master plan for the maintenance of equipment was witnessed and seen in order.	Compliance was confirmed during the inspection.
ILO SHG 16.1.6	Eyewash	The facility had eye-wash stations at certain locations, the bottles were checked for expiry dates. Some of the bottles were leaking and close to empty, and the sterility of the liquid could not be confirmed. Other bottles were found in order. It was recommended that the applicant review their procedures for provision of eye wash both onshore and onboard. In response to the draft report, the applicant informed of the following: "As per SRFP section 3.4.9.1- For Onshore: As per plot layout 2 nos of Eye wash units outside Haz Waste storage rooms and 1 nos at PPE room. For Onboard: 1 nos each as part of forward and aft emergency kits." Based on this, it is understood that eye-wash stations should now be available both onshore and onboard, which is welcome. The new arrangements in place at the yard can be evaluated during a potential future site inspection.	Compliance was partly confirmed during the inspection.

MEPC 210(63) Section 3.3.4.8	Condition of electrical equipment	The condition of electrical equipment and wiring was found in acceptable / good condition. The emergency generator was seen to be in good condition.	Compliance was confirmed during the inspection.
MEPC 210(63) Section 3.3.4.7	Housekeeping and illumination	Housekeeping and illumination were found adequate / good. The yard coordinator, housekeeping supervisor and munkadams/supervisors are responsible for good housekeeping.	Compliance was confirmed during the inspection.
ILO SHG: p49: 7.1.7	Instructions and signage	Signage, both informative and safety, was observed as very good.	Compliance was confirmed during the inspection.
Technical guidance note 2.3.3, MEPC 210(63) Section 3.1.2 ILO SHG: 8.8	Fire station manning, fire-fighters	The facility does not have a fire station and relies on the Alang Fire Brigade in case of a large or escalating fire. Mock fire drills with search and recovery is held regularly at the facility. The facility was asked to describe if they have drills with involvement from the Alang fire brigade. In response to the draft report, the facility replied: "We have applied to the Fire Department for a joint drill and expect to have our drill done upon arrival of next vessel." The facility had a fire and safety room, with firemen's outfit and breathing apparatus found in adequate condition. The facility reported that emergency response teams were responsible for firefighting, as described in the EPRP. The SRFP refers to the EPRP for details of the Emergency Response Teams (ERT). However, the EPRP in force at the time of the site inspection did not provide details of the members or roles of the ERT. The applicant was asked to advise on how the ERT is managed, and include details (e.g. name, occupation, role in ERT and contact number) in the EPRP and SRFP as found necessary. In response to the draft report, the facility informed that the EPRP has been revised to	Compliance was partly confirmed during the inspection.

		reflect the details of the ERT. During the inspection, the facility advised that "Fire on ship" and "Fire on Plot" emergency mock drills were held on a 3-month cycle. It was also mentioned that all workers receive Fire Safety training. Furthermore, it was shown that the Emergency Response Team have firefighting training on a bi-monthly basis. In response to the draft report, the applicant further informed: "SRF carries out one mock drill per week during the recycling of last vessel Clara Maersk. The KPI shows that 47 Nos of mock drills had been done as against 48 Nos planned in the KPI."	
		The new measures taken by the facility in response to the findings of the inspection are welcome and their implementation can be evaluated during a potential future site inspection.	
ILO SHG: p83: 8.8.8	Fire station equipment	The evaluators visited the Alang fire station on March 13 th 2019 finding it in fair condition with untidy and dirty equipment storage, including hoses mixed used / unused, and locked away firefighting equipment. There was one fire truck in operation, one water truck and one smaller vehicle, while a number of fire trucks were deteriorating in the back yard, some of them designated for auction.	N/A
		No fireman outfits were readily stored on the trucks for rapid response, they had to be retrieved from the store and un-bagged. The accumulated dust on the bags revealed they had not been used for a while. Reportedly the firefighters may use the firefighting equipment at the yards.	
		While the existence of a well-functioning fire brigade is not a requirement in the ILO, IMO or in the EU Commissions technical guidelines, the evaluators noted that the fire brigade did not seem to be fully equipped to deal with a major fire accident in the Alang-Sosiya ship breaking area.	

MEPC 210(63) Section 3.3.6, ILO SHG: 8.8.11	Fire alarm system on shore	The facility fire & emergency alarm is the same alarm as they use for teatime and lunch. The alarm does not notify the Alang fire brigade.	Compliance was confirmed during the inspection.
ILO SHG: 8.8.11	Fire alarm system on vessel	There were reportedly no fire alarms on the vessel, however the alarm system onshore is loud.	Compliance was confirmed during the inspection.
Technical guidance note 2.3.3, MEPC 210(63) Section 3.3.6, ILO SHG: 8.8	Fire prevention measures general	Fire prevention measures are laid down in the SRFP and EPRP. The primary prevention measure is the safe for hot work procedure, managed by the HS Department, which was seen to be implemented. The facility is inspected daily by the HSE supervisors. Otherwise, general training on fire prevention and mitigation for all workers were in place.	Compliance was confirmed during the inspection.
MEPC 210(63) Section 3.3.6, ILO SHG 13.4.5	Combustible materials and hot- work	The facility has an instruction, SRFP Sec.3.4.3, that prior to steel cutting all combustible materials in the area are removed.	Compliance was confirmed during the inspection.
MEPC 210(63) Section 3.3.4.4, ILO SHG 8.8.1, 13.5.2.	Condition of AC/OX lines	The facility does not have a central LPG tank, but uses portable bottles in racks. Liquid oxygen storage is centralised, in a 20 000l tank. The tank was found to be in good condition. AC/OX hoses, connections and gas manifolds were found in adequate condition.	Compliance was confirmed during the inspection.
MEPC 210(63) Section 3.3.4.4	Transporting/storin g flammable gases	Bottles and stored and transported in an adequate manner.	Compliance was confirmed during the inspection.

MEPC 210(63): p21: 3.3.5, p23: 3.3.6	Fire hydrants	Hydrants and hoses were observed on site and found in good working condition. Lockers were provided for the hoses. A hydrant and hose were tested and seen with adequate pressure and spray range. The fire hydrants were supplied by a 40,000-litre fire water tank.	Compliance was confirmed during the inspection.
ILO SHG: p83: 8.8.10	Fire extinguishers	Fire extinguishers were sighted throughout the facility. The assessor spot checked for expiry date. All were found in order.	Compliance was confirmed during the inspection.
MEPC 210(63): p22: 3.3.6, ILO SHG: p82: 8.8.3	Smoking areas	Smoking is not allowed within the facility, except in designated areas.	Compliance was confirmed during the inspection.
	Security management	The facility has an in-house security team, responsible for 24/7 site security and security procedures. The security office was observed, being the location of signing in and out, with visitor and employee ID cards. The assessors were required to register and show ID on arrival, receiving an entry ID card.	N/A
	Access control to facility; security patrols	The facility is covered by CCTV.	N/A
ILO SHG 8.4.2	Entrances / gates, fencing	Employee and visitor access cards are issued by the security office. Workers enter and leave through the main gate, or security office gate, covered by CCTV.	Compliance was confirmed during the inspection.
Technical guidance note	Training	The facility has an implemented training scheme described in the SRFP.	Compliance was

2.3.3, 2.1.4, 2.3.1, MEPC 210(63) Section 3.1.2, 3.1.4, 3.3.4.3, 3.3.6, 3.4.4 / BC TG: p3: figure 1, p84: 6.1, 6.2,		A selection of training records were sighted during the site visit, and it was demonstrated using the facility's MIS system how an overview was maintained.	confirmed during the inspection.
Technical guidance note 2.3.2, MEPC 210(63) Section 3.3.4.10	PPE	The use of PPE was observed to be well implemented at all times during the site visit. The workers had readily available PPE, at no cost. The PPE store was found well stocked. The evaluators were offered new PPE for the site tour. The cutters were observed using 3M 6000 series half faced mask with 2091 cartridges. The 2091 cartridges are dust filters and not fume filters. Expiry dates on mask and filters were all ok. The applicant was asked to describe what type of assessment they performed to identify the nature of hazards and the exposure upfront of choosing the FFP2/2091 cartridges and if they have evaluated situations where this will not be sufficient. In response to this, the applicant submitted additional information in their replies to the draft report (ref. Attachment 31a - PPE selection for 2091 and Attachment 31b - 3m 2091 - P100 Data Sheet), which is considered adequate. Normally, an expiry date is provided in helmets. Expiry dates in helmets could not be witnessed on-site. When asked on replacement of helmets, the applicant explained that this was based on colour fading, missing strap or any visible damage. The applicant did not have a system to follow up on helmets. The evaluators suggested introducing a system to ensure that the applicant follow the Indian Industrial Standard. After the inspection the applicant forwarded a document titled 'PPE standard for gas cutter helper and helmet expiry'. According to IS 2529 the helmets expiry date is 18 months from	Compliance was confirmed during the inspection.
		date of manufacture. The applicant plans to write the date of procurement and the expiry	

authorities, re	ports any incidents, ac	date inside the helmets. To create awareness, the applicant will include information on this in their General Safety training. ds on incidents, accidents, occupational diseases and chronic effects and, if requested by its concidents, occupational diseases or chronic effects causing, or with the potential for causing, risk	•
	health and the enviro	onment;	
Technical guidance note 2.3.4, MEPC 210(63) Section 3.3.4.11 and Appendix IV, ILO conventions	Medical monitoring	The applicant used to have a medical monitoring program in place using the prescribed Form 32 and 33. Based on input from the previous inspections reports in Alang the applicant had initiated additional monitoring of workers' health upfront of the inspection. A risk assessment of health monitoring had been prepared by the doctor, plot manager and the environmental officer. Medical records were witnessed on-site. After the site inspection the applicant forwarded a 'Workers health monitoring and remediation plan'. The new program is developed in consultation with a doctor at the Alang hospital. The medical check-up includes 21 different tests and 97 workers were tested. The evaluators witnessed medical records for several workers on-site. A report summarising the findings were witnessed on site. The report was prepared by the doctor at the Alang hospital and includes corrective measures and describes follow up of workers.	Compliance was confirmed during the inspection.
	Incident monitoring and reporting	Leading indicators (incl. safety observation card, drills, HSE audits and employee suggestions) demonstrated that HSE management was operational and used actively. (Note: Whilst "Employee suggestions" is used in this document, it was observed during the site visit that the box provided for such suggestions was named "Complaint box"). The applicant was asked to clarify the process of obtaining suggestions from their workers. In response to the draft report the applicant replied:	Compliance was partly confirmed during the inspection.

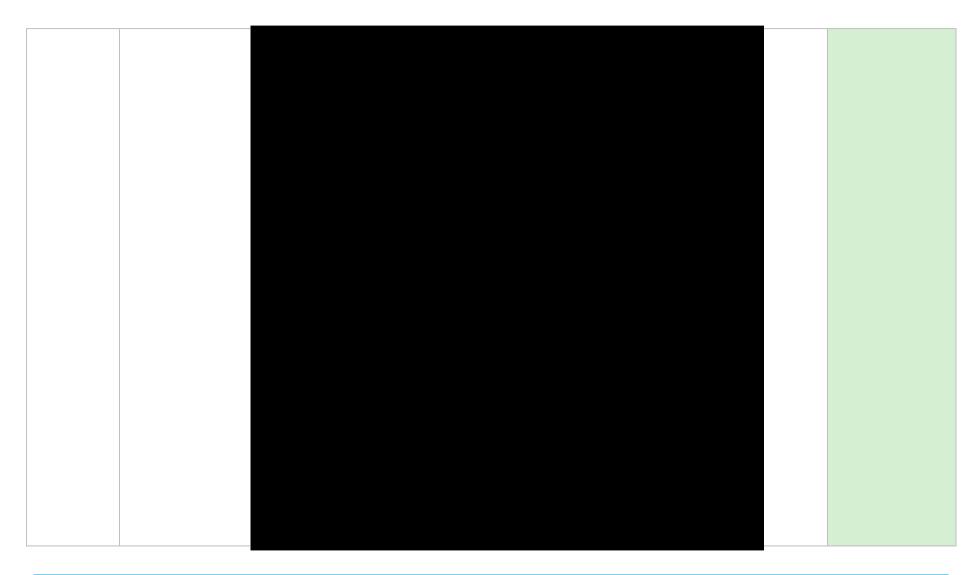
	"Complaints and suggestions are encouraged and made freely at this SRF. The following are the avenues which are available to the workers for their complaints /suggestions. Complaint Box Daily Tool box meetings Monthly Meeting Daily Closing meetings All-time access to Labour manager and asst. labour Manager- This is by far the most effective system where complaints are received and disposed off without delay. The Labour Manager has extraordinary authority to take decisions in matters of worker issues." The new measures and improvements implemented by the facility can be evaluated during a potential future site inspection.	
Statistics	Accident statistics The Medicine Issue Register was sighted with the following observations: • 2016: 12 treatments • 2017: 14 treatments • 2018: 8 treatments • 2019: No treatments (It could not be explained why there had been no treatments recorded this year) It was reported that there had been no Lost Time Injuries (LTI). However, the HSE Key Performance Indicator (KPI) report was provided which showed one LTI in 2018.	Compliance was confirmed during the inspection.
Near-miss reporting	Near Misses are not recorded formally. However, the HSE Key Performance Indicator (KPI)	Compliance was

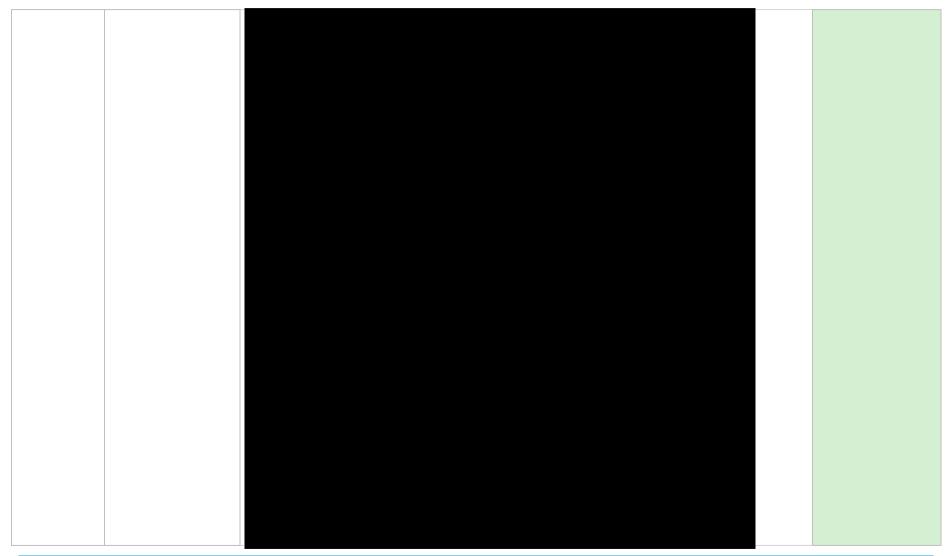
	report was provided which showed that Near Miss was a measured KPI.	partly confirmed during the
	The applicant was asked to clarify their procedures and methods on this subject.	inspection.
	Further observations from the HSE KPI report for year-to-date 2019 are:	
	- No incidents (LTI, F, RWC, MTC, FAC, near-miss or property damage).	
	- No intertidal zone or impermeable floor spillages	
	In response to the draft report the applicant replied:	
	"If anyone observes a situation which may create a safety or environmental hazard, he immediately contacts the HS Officer who records the situation and the corrective measures taken as a SOR. Find a copy of SOR as attachment 20a.	
	If however, the hazard was not noticed and an incident occurred which fortunately did not result in an injury or environmental hazard, that is recorded as a Near Miss. Find copy of Near miss report as attachment 20b.	
	Inadvertently some near miss was recorded as SOR's. The system has been reviewed and from 14th October onwards the Near Miss will be recorded more diligently and the follow up action taken."	
	The new measures and improvements are welcome and their implementation can be evaluated during a potential future site inspection.	
Non-conformance	It was found that during the applicant's routine inspections of lifting and pulling equipment	Compliance was
procedures	that items found not to be conforming with pre-defined criteria were discarded and replaced	not confirmed
	with items conforming to the criteria. The applicant could not demonstrate that such discarding was documented. Inspection logs recorded that items were found acceptable	during the inspection.
	(i.e. they were acceptable once replaced). This is not an ideal process and the applicant	mspection.
	was recommended to consider inclusion of non-conformance procedures which permit	

		traceability.	
		In response to the draft report, the facility informed: "The procedure has been changed to record each such defect observed as an NC and once replaced /repaired to close such NC."	
		The new measures and improvements are welcome and their implementation can be evaluated during a potential future site inspection.	
	HSE Incentives	No additional incentives, to regular wages, were identified.	Compliance was confirmed during the inspection.
	Corporate social responsibility	The facility did not have a corporate social responsibility (CSR) statement, but the company policy is described in Sec. 1.1.4 on page 24 of the SRFP.	N/A
	•	hip recycling facility shall send the ship recycling plan, once approved in accordance with Article ecognised organisation authorised by it;	e 7(3), to the ship
MEPC 210(63) Section 3.2.4, 3.4.2.1	Ship recycling plan	The facility had provided a SRP in their initial application, which was found acceptable during desk assessment.	Compliance was confirmed during
		Following the comments to the SRFP in this report, it is expected that the next SRPs will be revised accordingly.	the inspection.
		In response to the draft report, the facility confirmed that it will revise the SRP in lines to the changes in the SRFP.	
Article 13 (2)	(b): report to the admi	nistration that the ship recycling facility is ready in every respect to start the recycling of the sh	nip;
MEPC 3.2.3-3.2.6	Ready for recycling certificate	The facility has experience in running projects in line with IMO/EU Regulation procedures with IHM Part 1,2 and 3 and a SRP.	The evaluators are of the impression
		As part of the application file, the facility submitted the specific statement concerning the recycling of EU Member States flag ships (part 5 of the application). According to the signed	that the organisation easily
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		statement, the facility will prior to any recycling of the ship — send the ship recycling plan, approved by the competent authority according to the procedure applicable, to the ship owner and the administration or a recognised organisation authorised by it; — report to the administration that the ship recycling facility is ready in every respect to start the recycling of the ship The evaluators are of the impression that the ship recycling facility can adapt to these new legal regimes.	can adapt to these new legal regimes.
partial recycl	ing in accordance wi	or partial recycling of a ship is completed in accordance with this Regulation, within 14 days of the ith the ship recycling plan, send a statement of completion to the administration which issued the ment of completion shall include a report on incidents and accidents damaging human health and	ready for recycling
MEPC 210(63) Section 3.2.7	Statement of completion	The facility issued a statement of completion, as required by GMB. A completion report was witnessed in the JRD ERP system on-site. The applicant was asked to forward an example of completion statement. This was received in response to the draft report (ref. Attachment 21).	Compliance was confirmed during the inspection.
the permit, li	cense or authorisati	mit, license or authorisation granted by its competent authorities to conduct the ship recycling an on granted by the competent authorities to all its contractors and sub-contractors directly involve rmation referred to in Article 16(2);	
Technical guidance note 2.2.1, MEPC 210(63) Section 3.2.2	Authorisation	Thoroughly checked during the document review. The desk assessment identified that GPCB Authorisation was due to expire on the 23.03.2019. Renewed authorisation was shown on site. The applicant was asked to provide a copy of the latest version of the authorisation. This was forwarded in response to the draft report (ref. attachment 1).	Compliance was confirmed during the inspection.

MEPC 210(63) p8: 3.1.2, p10: 3.2.2 / BC TG: p38: 3.4.3	Sub-contractors	The applicant was asked to confirm if the last SRFP includes the current sub-contractors. Reportedly, changes have been made since the site inspection and an updated list of sub-	Compliance was confirmed during
DC 1G. p36. 3.4.3	-	contractors was forwarded in response to the draft report (ref. Attachment 22):	the inspection.





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specifying the MEPC.196(62) Section 5	Explicit or tacit procedure (a): the method of recy	he ship recycling plan will be approved by the competent authority through a tacit or explicit parts to tacit approval, in accordance with national requirements, where applicable; Today the SRP is reportedly approved by explicit approval by GMB. This is specified in the Ship Recycling Code, 2013 under chapter 5.3. The evaluators were of the impression that the organisation easily could adapt to any new legal regimes with regards to approval of the SRP. In the evaluators were of the impression that the organisation easily could adapt to any new legal regimes with regards to approval of the SRP.	The evaluators are of the impression that the organisation can easily adapt to these new legal regimes.
	• •	as regards hazardous waste management; (d) details on the explicit or tacit procedure, as refe cycling plan by the competent authority; (e) the maximum annual ship recycling output	erred to in Article
	Method of recycling	The method is by intertidal landing.	Compliance was confirmed during

	Type and size of ships that can be recycled	The facility can dismantle all ship types with the following ship dimensions: Length: no limit Width: 47 meters Draught: no limit	Compliance was confirmed during the inspection.
	Any limitation and conditions	The limitations and conditions under which the facility operates are included in the relevant permits issued by the competent national authorities. The evaluators' understanding was that due to the width limitation of 47 meters it could be challenging for the applicant to dismantle rigs. The applicant was asked to confirm if they would accept rigs for dismantling. In case the applicant would accept rigs for dismantling, a detailed instruction is required in the SRFP. In response to the draft report, the facility informed: "We will accept a rig within the acceptable dimensions (width 47 m) and also after ensuring that our crane can handle each portion of the rig. It is expected that if our crane can reach every part of the rig, the dismantling procedure will be similar to that of a vessel with logical improvisations. Refer section 2.3 of SRFP." The procedures for rig dismantling can be evaluated during a potential future site inspection.	Compliance was confirmed during the inspection.
	Maximum annual ship recycling output	The applicant was requested to provide a list over the maximum capacity achieved in a specific year over the past 10 years (i.e. a list of recycling projects completed on a date falling between 1 st January and 31st December). Reportedly, the maximum annual ship recycling output was achieved in 2017, with 37 104 ldt. Supporting evidence was forwarded in response to the draft report (ref. attachment 23).	Compliance was confirmed after the inspection.

	Confirmation	A formal Confirmation Statement concerning the recycling of EU Member State flag ships	Compliance was
	Comminacion	was provided and is in accordance with the template (part 5) of Commission Implementing	confirmed during
		Decision (EU) 2015/2398. The document is dated 01.10.2018.	the desk
			assessment.
	• • •	hat the ship recycling facility is capable of establishing, maintaining and monitoring of the safe e ship recycling process;	e-for-hot work and
KC: p14: R1(7),			
MEPC 210(63)	Safe- for- hot work	The safe for hot-work procedure including competent persons, testing, marking and	Compliance was
Section 3.3.4.2 / LO SHG:	certificate, warning	recording was seen to be fulfilling and in good order.	confirmed during
0110:13.4	signs and labels		the inspection.
HKC: p26: R19(2), BC TG: p47: 4.2.1	Confined spaces	The safe for entry procedure including competent persons, testing, marking, permits and recording was seen to be fulfilling and in good order.	
Article 15 (2)	(e): attach a map of the	e boundary of the ship recycling facility and the location of ship recycling operations within it;	
HKC: p43: 1.5, MEPC 210(63) Section 3.2.1	Map of facility	The Facility Layout drawing provides detailed information and was found to represent the actual layout of the facility.	Compliance was confirmed during the inspection.
Article 15 (2) (specify:	(f) for each hazardous	material referred to in Annex I and additional hazardous material which might be part of the s	tructure of a ship,
• •		y is authorised to carry out the removal of the hazardous material. Where it is so authorised, the removal shall be identified and evidence of their competence shall be provided;	ne relevant
MEPC 210(63)			
ection 3.1.3,	Workers'	Workers' licences and certificates were spot checked and found in order.	Compliance was
3.1.4	certificates/licences		confirmed during
			the inspection.

(ii) which waste management process will be applied within or outside the ship recycling facility such as incineration, landfilling or another waste treatment method, the name and address of the waste treatment facility if different from that of the ship recycling facility, and provide evidence that the applied process will be carried out without endangering human health and in an environmentally sound manner;

MEPC.210(63), Section 3.1.1	Regulatory requirements environment	The authorisation from GPCB makes specific references to the Hazardous And Other Wastes (Management and Transboundary Movement) Rules, 2016, which includes handling of persistent organic pollutants such as PCB, PFOS, PBB, PBDE, HBCDD, PCN and SCCP.	Compliance was confirmed during the inspection.
Technical guidance note 2.1.4, MEPC210(63) Section 3.4.1, Appendix 1, BC TG Executive summary (p1), 4.3, 2.1, 2.5, 3.2, 3.4.2, 3.4.4, 4.1, 4.2.2, 4.2.5, 6.2, 7.1, 7.3,	Environmental management	The environment officer has the overall responsibility.	Compliance was confirmed during the inspection.
Technical guidance note 2.2.5, MEPC210(63) Section 3.4.2, BC TG: p45: 4.2, ILO SHG: p4: 2.3.2	Management of hazardous waste	The applicant had updated its procedures after the comments in the desk assessment and recently started with additional sampling. The facility has developed a new systematic sampling regime, which was found adequate, except for the scope of the accreditation of the laboratories as mentioned in the row on waste management above.	Compliance was confirmed during the inspection.
Technical guidance note 2.2.3, MEPC210(63) Section 3.4.3.1, ILO SHG p90: 9.2.3	Management of asbestos	Asbestos is removed by Cherry Waste Management appointed by SRIA to remove asbestos. Cherry waste management arrives on-site with a negative pressure van, where they remove asbestos containing materials. The asbestos procedure describes removal of asbestos on the vessel as well as in the asbestos de-contamination unit. The facility has a storage room for asbestos containing waste with adequate capacity. Asbestos and asbestos containing material (ACM) is subsequently delivered to GEPIL.	Compliance was confirmed during the inspection.

		The applicant was asked to provide documentation of the negative air pressure unit, but no answer was received. This point can be discussed during a potential future site inspection.	
MEPC210(63) Section 3.4.3.2	Management of PCBs	The SRFP includes procedures for solid and liquid PCB which are adequate. If found, PCB containing materials will reportedly be sent to SAVA in Germany for destruction.	Compliance was confirmed during the inspection.
MEPC210(63) Section 3.4.3.3	Management of Ozone-depleting substances (ODS)	During the site inspection, the applicant described that a subcontractor removes all the gases on board. The SRFP contains a description for removal of ODS gases and of ODS in insulation foam. ODS gases, except Halon, are reportedly sent to Customs while insulating foam is sent to GEPIL. If found, Halon is reportedly exported to A-Gas in the USA. Further supporting information was forwarded in the response to the draft report (ref. Attachment 24), showing export of halon to the US.	Compliance was confirmed during the inspection.
MEPC210(63) Section 3.4.3.4	Management of paints and coating including antifouling with organotin TBT	The SRFP contains a description of TBT paint and toxic and flammable paints. Reportedly, the applicant removes TBT paint mechanically by scrapers prior to gas cutting. The Antifouling Convention applies to ships and applies to new and sailing vessels. The Convention has been in force for more than a decade. For most ships, except those e.g. in lay-up, two dry-docks would be expected since the entry into force. During dry-dock the hull will be sandblasted, and new antifouling paint is applied to optimise hull performance, hence it is less likely with TBT in anti-fouling. The procedure contains a description to collect slag from cutting of the side shell and	Compliance was confirmed during the inspection.

		double bottom. Paint and coating are reportedly incinerated at GEPIL.	
MEPC210(63) Section 3.4.3.5	Procedures for operationally generated wastes	Reportedly, all operationally generated waste is collected and sent to GEPIL (SRFP page 168). This includes drainage water on-site, bilge, sludge, contaminated sand, incinerator ash, glass wool and sediments in ballast tanks.	Compliance was confirmed during the inspection
	Perfluorooctane sulfonic acid (PFOS)	The applicant has an adequate procedure for removal of PFOS. PFOS containing materials above the threshold level for hazardous waste will reportedly be sent to SAVA in Germany. The applicant has initiated sampling for PFOS. The authorisation from GPCB makes specific references to the Hazardous And Other Wastes (Management and Transboundary Movement) Rules, 2016, which includes PFOS and other persistent organic pollutants.	Compliance was confirmed during the inspection.
MEPC210(63) Section 3.4.3.6	Heavy metals (lead, mercury, cadmium and hexavalent chromium)	The SRFP includes a procedure for heavy metals, found adequate. It is stated that Equipment containing mercury shall be sold to the vendors. The applicant was asked to explain what is meant by vendor in this context. In response to the draft report, the facility clarified: "Vendors meant our buyer who would supply this equipment for marine reuse. However, we have now decided to send mercury containing material to TSDF and not resell." On-site, the evaluators were told that Lead acid batteries are sent to authorised GPCB facilities.	Compliance was confirmed during the inspection.
MEPC210(63) Section 3.4.3.7	Other hazardous materials in Annex II	The applicant has developed and recently implemented a systematic risk-based sampling methodology to detect PBB, PBDE, HBCDD, PCN and SCCP. The applicant has reportedly never found or removed PBB, PBDE, HBCDD, PCN and SCCP.	Compliance was confirmed during the inspection.

		If found, these materials will reportedly be sent to SAVA in Germany. The applicant had taken a few samples upfront of the inspection.	
MEPC210(63) Section 3.4.2.2	Additional sampling and analysis	The yard has until recently taken very few additional samples and have mainly relied on the IHM before re-selling equipment. The applicant had initiated more additional sampling and on-site the evaluators witnessed various sample records. Please refer to the row on waste management above.	Compliance was confirmed during the inspection.
MEPC210(63) Section 3.4.2.3	Identification, marking and labelling	The applicant ensures identification, marking and labelling per the IHM.	Compliance was confirmed during the inspection.
Technical guidance note 2.2.5 (a), MEPC210(63) Section 3.4.2	Transport of waste	Transportation of hazardous waste to GEPIL is by licensed trucks from GEPIL. The vehicles from GEPIL are equipped with GPS and designed per the Transportation guideline of the GPCB: (https://www.gpcb.gov.in/payroll/GUIDELINES 4 PA OF RULE 9 HAZ OTH WASTE 2016 .PDF). A manifest system is used as per the GPCB guideline.	Compliance was confirmed after the inspection.
		It was unclear to the evaluators if other waste e.g. lead acid batteries is transported by licensed trucks. The applicant was asked to provide information on transportation of other types of wastes.	
		In response to the draft report, the facility submitted additional information on transportation by subcontractors, including a copy of an email sent by the subcontractor for transport of Lead Acid Batteries (ref. Attachment 25).	
		The authorisation from GPCB contains reference to transportation, but not to the specific rules that apply. From other local applications the evaluators' understanding is that the Hazardous Substances (Classification Packaging and Labelling) Rules, 2011 and The Central Motor Vehicles Rules, 1989 apply.	

Technical guidance note 2.2.5 (c)	Applied process	Please refer to Article 15 (5) below.	
Article 15 (2)	(g) confirm that the co	mpany adopted a ship recycling facility plan, taking into account the relevant IMO guidelines;	I
		Please refer to Article 13 (1) (e) above in this table.	
Article (2) (h)	: provide the informati	on necessary to identify the ship recycling facility.	
		Please refer to Article 13 (1) (a) above in this table.	
Technical guidance note 2.2.5 (c)	Waste management facilities	Ensuring sustainable downstream management of wastes generated by the ship dismantling activities is an important requirement under the EU Ship Recycling Regulation.	Compliance was partly confirmed
may only be waste will be international	assumed to be in place operated in accordance and Union standards.	rticle 13, with regard to the waste recovery or disposal operation concerned, environmentally provided the ship recycling company can demonstrate that the waste management facility where with human health and environmental protection standards that are broadly equivalent to reference exercises exercise by the chiral standards.	ich receives the elevant
(0)	racincles	Section 2.2.5 in the <u>EU Technical guidance note</u> provides specific information on the	after the
			inspection.
		requirements for non-EU facilities to demonstrate that the waste management facilities follow standards broadly equivalent to international and EU standards. The	inspection.
		follow standards broadly equivalent to international and EU standards. The requirements/standards applied in the waste management facilities must ensure a similar	inspection.
		follow standards broadly equivalent to international and EU standards. The	inspection.
		follow standards broadly equivalent to international and EU standards. The requirements/standards applied in the waste management facilities must ensure a similar level of protection of human health and the environment as in international/EU standards.	inspection.

Name of facility	Waste types transferred from applicant	Applied waste management process	Relevant permit/ Validity
GEPIL	Asbestos and asbestos containing materials Glass wool Cementing material Ceramic Rusted iron scale Contaminated sand Chemical sludge from waste treatment Foam insulation – 'Thermocol' Rubber PVC/plastics Oily rags Oily sludge Bilge water Waste water	Incinerated Effluent treatment plant (ETP)	GPCB. Issued to GMB and not to GEPIL/ 09.03.2021.
Cherry Waste Management	Radioactive materials containing items (e.g. smoke detectors)	Removal of radioactive source	AERB/ 20.08.2021
Gravita India Limited	Lead acid batteries	Recycling into new lead products	Rajasthan Pollution Control Board / 30.06.2023
Jensen International	Lube oil and fuel oil	Re refined oil	GPCB / 30.06.2021
E-Coli Waste Management Pvt.Ltd.	E-Waste	Collect, treat and resell E-Waste	GPCB/ 13.10.2021
Bharuch Enviro Infrastructure Limited (BEIL)	E-waste, scrap cables and mercury waste	Collection, transportation and storage of E-waste	Expired 28.11.2019, application for extension dated 13.11.19
REMONDIS SAVA GMBH, Germany	Persistent Organic Pollutants	Incineration	Federal Ordinance on Specialised

Recycling Solution Pvt. Ltd. (RSPL)	Hazardous waste	Mixing hazardous waste into fuel to be co-processed in the cement industry	Waste Management Companies, the EfbV. / 18.03.2020 GPCB/ 21.12.2021
Customs	Gaseous ODS	Unknown	Unknown
Alang hospital	Medical waste	Unknown	GPCB/ 08.02.2023

Below follows a more detailed description of the various downstream waste management companies based on the information received from the applicant and other sources.

GEPIL

Several types of waste generated by the ship dismantling activities of the yard are transferred to the Treatment Storage and Disposal Facility (TSDF) in Alang. This facility was developed by the GMB and is operated by the Gujarat Enviro Protection Infrastructure Limited (GEPIL). The facility consists of a landfill site, an incinerator and an effluent treatment plant (EFP). The evaluators visited the GEPIL in the context of a previous site inspection visit in September 2018.

GEPIL's permit and its operation was checked against the requirements of the EU Landfill Directive and the EU Industrial Emissions Directive. Details are provided in the following sections.

a. Landfill

The permit specifies requirements and includes references to Indian guidelines/manuals. The permit was checked against Article 9 of the EU Landfill Directive.

The landfill has five cells where two are currently in operation:

- 1. Cell 1 asbestos containing waste and glass wool closed
- 2. Cell 2 Solid and chemical waste cell closed
- 3. Cell 3 Municipal solid waste in operation
- 4. Cell 4.1 Hazardous waste cell in operation
- 5. Cell 4.2 Municipal solid waste- not in operation

The permit includes a list of waste that can be landfilled and their quantities. It is understood that GEPIL does not receive any wastes which are non-acceptable according to the EU Landfill Directive.

From the documentation provided by GEPIL on-site during the evaluators' visit in September 2018, it appears that the landfill is constructed in a way to protect soil and water. The landfill has a geological barrier, leachate collection and sealing system. There is a leachate control well for each landfill cell. Specific requirements apply for capping the landfill with compacted soil, HPDE geomembrane, drainage layer, soil and vegetative layer.

It is understood that waste disposed of at the landfill is pre-treated, except for asbestos. Asbestos and ACM are immediately covered in concrete in cell 4.1 which is a hazardous waste cell. Asbestos arriving at site shall be wrapped in two layers of plastic.

The permit includes requirements for noise. The permit requires (point 5.9) that after closure of a cell, vents shall be installed and regular monitoring of the emission of the vent shall be carried out.

The permit requires regular monitoring of ground water and ambient air quality. However, it does not specifically define within which intervals this regular monitoring is carried out. Some monitoring reports were witnessed on-site during the evaluators' visit in September 2018. The evaluators understand that contracted third parties conduct monitoring and

GCPB conducts regular and unannounced monitoring of GEPIL.

Based on all the information currently available to the evaluators, it appears that the operation of the landfill likely follow standards broadly equivalent to international and EU standards.

The operational landfill Cell 4.1 (Hazardous waste) is close to reaching its full capacity. It is expected to be full by 2022. It is understood that a new land next to the current GEPIL site has been purchased recently for the purpose of constructing additional landfill capacity. It is expected that the construction of the new landfill will take around 1.5 years.

b. Incinerator

The incinerator at GEPIL is designed and developed in association with the KETEK Group from Canada. The permit was checked against the EU Industrial Emissions Directive (IED). The permit includes the waste types and quantities that can be incinerated. The incinerator has a capacity of 5 MT/day and designed to handle solid, semi solid and liquid hazardous wastes. GEPIL and GPCB confirmed that the incinerator is not designed for PCB, brominated flame retardants and other POP waste above the threshold level for hazardous waste.

The incinerator at GEPIL has two combustion chambers, primary (approximately 1000°C) and secondary (approximately 1200°C). The incinerator at GEPIL is equipped with a venturi scrubber, packed scrubber and HEPA filter.

The permit requires that there shall be no odour nuisance and odour mitigation/control measures shall be taken (point 4.5).

The permit does not include the maximum permissible period of any technically unavoidable stoppages, disturbances, or failures of the purification devices or the measurement devices, during which the emissions into the air and the discharges of wastewater may exceed the prescribed emission limit values.

Waste gases from waste incineration plants is discharged by means of a stack height of 32.5 m.

The permit does not include emission limit values for discharges of wastewater from the cleaning of wastewater as specified in Part 5 of Annex VI of the IED. This should however not be required as the wastewater resulting from the cleaning of waste gases is collected in wastewater tank 1 and 2 and reused in the process, in a closed loop system.

Requirements for monitoring of emissions are provided in Article 48 of the IED and it is required that emissions is carried out in accordance with Parts 6 and 7 of Annex VI. Monitoring shall be carried out in accordance with CEN standards or, if CEN standards are not available, ISO, national or other international standards which ensure the provision of data of an equivalent scientific quality. The permit from GPCB does not refer to specific standards, but the third-party monitoring reports refer to Indian standards.

Online flue gas analyser is attached for flue gas monitoring (measuring NOx, SOx, HCl, HF, CO, CO_2 , SPM etc.), observed on site by the evaluators in September 2018. This continuous emission monitoring system is connected to GPCB for real-time monitoring.

The evaluators understand that contracted third parties conduct air quality monitoring on a regular basis and GCPB conducts regular and unannounced monitoring. Under Part 6 in Annex VI of the IED it is stated that for periodic measurements at least three measurement values shall be obtained during each measurement exercise. The evaluators cannot confirm that 3 measurements values are obtained each time.

During the September 2018 visit to GEPIL, the evaluators witnessed third party test results on site. Contracted third parties were e.g. a university and the accredited laboratory Pollucon. According to the scope accreditation from NABL, Pollucon is accredited to measure the relevant parameters. The air emission limit values for waste incineration plants in part 3 of Annex VI of the IED were compared with the threshold values for GEPIL in the license from GPCB and found broadly equivalent.

The monitoring records seen by the evaluators on site had sometimes found PM_{10} in concentration above threshold limit for shorter periods. Heavy metals had not been measured above threshold level. GEPIL has in addition monitored PCB, brominated flame retardants and other POPs. Indications of these substances were not found during the monitoring period. The evaluators witnessed several monitoring reports from 2019 during a meeting with GEPIL in January 2020. All parameters were within the limits.

Based on all the information currently available to the evaluators, it appears that the operation of the incinerator likely follow standards broadly equivalent to international and EU standards.

The Japan International Cooperation Agency (JICA) has provided Official Development Assistance Loans for upgradation of environmental management for ship recycling in Alang and Sosiya. Part of the project is to further develop GEPIL. During the meeting with GEPIL in January 2020 it was explained that they would like to upgrade the incinerator to a Rotary kiln in 2-3 years. This would assist GEPIL in expanding their disposal methods to include amongst other ODS and PBB and PBDE in solid material.

c. Effluent treatment plant

GEPIL has an effluent treatment plant to treat wastewater from the recycling yards and leachate water from the landfill. The treatment plant is equipped with an oil and grease trap, followed by an oil skimmer and equalization tank. From this tank the water is pumped to a mixer where chemicals are added to the effluent, among others lime. The water is transferred into the flocculation tank and then to the settling tank. Further on the water is pumped to the aeration tank, then on to the secondary settling tank. The water is then pumped into the treated water storage tank. The daily capacity of the effluent treatment plant is 30K (30 000 litres).

The permit includes limit values for emissions to water. The permit requires the facility to

online monitor the effluent treatment plant for the following parameters: flow of outlet, pH, TOC or COD and ammoniacal nitrogen. Various monitoring reports were witnessed on site during the evaluators' latest visit to GEPIL in January 2020.

Based on all the information currently available to the evaluators, it appears that the operation of the effluent treatment plant likely follow standards broadly equivalent to international and EU standards.

However, some questions still remain regarding the collection and storage capacity. In particular, the evaluators understand that GEPIL has only one tank-truck to collect bilge water and drained water from the ship recycling yards. Based on this, the evaluators question if one tank-truck is sufficient during the monsoon season, and, secondly, if the effluent treatment plant has sufficient capacity to handle drained water from the 150+ ship recycling plots located in Alang.

During a meeting with GEPIL in January 2020, storm water records were witnessed on-site from which it was evident that only a few numbers of facilities deliver storm water to GEPIL. It was understood that the applicant is not among these facilities.

Based on this, the evaluators can only assume that the remaining yards which do not transfer stormwater to GEPIL release it to the sea or dispose it elsewhere through unofficial methods. The relevant procedures followed for the disposal of stormwater by the applicant can be further clarified during a potential future site inspection.

Finally, as mentioned previously, the Japan International Cooperation Agency (JICA) is financing an ongoing project for upgradation of environmental management for ship recycling in Alang and Sosiya. Part of the project is to further develop GEPIL. During the meeting with GEPIL in January 2020, it was explained that they would like to expand the ETP. A timeline is yet to be decided.

Cherry Waste Management

It is understood from the SRFP that items containing radioactive substance such as smoke detectors are collected by the licensed subcontractor Cherry Waste Management. Per the license from the Atomic Energy Regulatory Board (valid until 20.08.2021) Cherry Waste Management is authorised to 'separate the radioactive source part for volume reduction'. Subsequently, the radioactive materials are handed over to the Atomic Energy Regulatory Board (AERB) for final disposal.

The license from the AERB does not include requirements for handling of the smoke detectors, excluding the radioactive source. In Europe the disposal of ionising smoke detectors is regulated by the Directive 2012/19/EU on waste electrical and electronic equipment (WEEE). Disposal of the smoke detector in normal refuse is prohibited by the WEEE Directive. The radioactive source must be removed from the smoke detector before treatment of the WEEE can begin. The evaluators have not received information on how or where Cherry Waste Management dispose the smoke detectors after removal of the radioactive source. In addition, questions remain concerning the final disposal of radioactive materials transferred to AERB. It appears that AERB is not a waste management facility but a central government organisation. According to a document titled 'Policies Governing Regulation of Nuclear and Radiation Safety (July 2014)' available at the AERB website (https://www.aerb.gov.in/images/PDF/Policies Governing Regulation.pdf), AERB is in charge of carrying out certain regulatory and safety functions envisaged under Section 16, 17 and 23 of the Atomic Energy Act, 1962. Section 16 and 17 of the said Act pertain to control of radioactive substances and special provisions with regard to safety in production, handling, use and disposal of radiation / radioactive substances respectively in India. Section 23 of the Act deals with administration of the Factories Act, 1948, in the factories owned by the Central Government or any authority or corporation established by it or a Government Company and engaged in the use of atomic energy. The Central Government has appointed AERB as the Competent Authority to enforce the safety related rules under the said Act.

Hence, it remains unclear to the evaluators which processes and waste treatment methods apply with respect to the disposal of radioactive materials containing wastes collected by Cherry Waste Management and reportedly transferred to AERB.

In response to the draft report the applicant referred to the webpages of AERB: https://www.aerb.gov.in/english/. The evaluators found a link to 'Wastes from Medical, Industrial and Research Facilities' from the provided webpage, but waste treatment method of radioactive materials could not be found here.

However, the evaluators understand from other local applications that smoke detectors may be sent for safe disposal at Bhabha Atomic Research Centre (BARC). According to the BARC website, management of low-level waste will be stored for 10 to 50 years, which will allow most of the radioactive isotopes to decay. The waste is then disposed of as ordinary waste.

It is understood from the info published on the AERB and BARC websites, that these government bodies follow international standards. Therefore, it can be assumed that the treatment of radioactive materials transferred to AERB/BARC occurs according to standards broadly equivalent to relevant international and EU standards.

Gravita India Limited

At the time of the site inspection, the applicant was reportedly transferring waste batteries and accumulators to Bharat Metal Oxides. However, they were already in the process of changing from Bharat Metal Oxides to Gravita.

In the EU, the general rules concerning the management of waste are laid down in the Waste Framework Directive 2008/98/EC. Specific legislation on waste batteries is embodied in the Batteries Directive 2006/66/EC.

After the site inspection, the applicant forwarded a copy of the relevant license issued by RPCB to Gravita and confirmed that they will no longer use Bharat Metal Oxides.

The RPCB license is based on the provisions of Hazardous And Other Wastes (Management and Transboundary Movement) Rules, 2016, which is the national implementing legislation for the Basel Convention.

According to the license, Gravita is a lead/lead alloys plant authorized to recycle lead acid batteries and lead scrap into lead and lead alloys pure lead, lead oxide and lead sheet.

Per the license, the facility has several furnaces: Barton furnace, red lead/litharge furnace, refinery furnace and rotary furnace with specific emissions limitations. Furthermore, specific requirements apply for trade effluent, provided on page 4 of the license.

The applicant has also forwarded additional documentation (ref. Attachment 25 g) which includes some monitoring results of ambient air, lead content in blood, soil sample, solid waste sample, drinking water sample and a wastewater sample. However, in the absence of any additional description or information, it remains unclear to the evaluators if Gravita complies in practice with the license conditions. Also, no copies of monitoring of the four furnaces were received.

Based on the limited information currently available to the evaluators, it is not possible to conclude that Gravita follow standards broadly equivalent to relevant international and EU standards, but this issue can be further evaluated during a potential future site inspection.

Jensen International

At the time of the site inspection, the applicant was reportedly transferring used oil and waste oil to three facilities: Mazda Industrol, Gujarat Oil Recyclers and Jensen International. Of these, only the last facility (Jensen International) has reportedly been maintained as a subcontractor after the site inspection.

However, details regarding this facility were not available at the time of the inspection. The evaluators saw neither the relevant permit issued to Jensen International by the GPCB, nor any further reports on compliance of this facility with the permit conditions.

In response to the draft report, the applicant confirmed that Jensen International remains their subcontractor for used oil and waste oil, and forwarded the relevant permit issued by the GPCB to this company together with a copy of Environmental monitoring agreement and a copy of NABL certificate of agency UNISTAR Environment and Research labs Pvt Ltd. (ref. Attachment No.27).

According to the license from GPCB, Jensen International is authorised to manufacture re refined lubrication oil and fuel oil. Specific requirements apply to the trade effluent, emissions from the furnace and the ambient air quality.

In the EU the management of waste oils is regulated by the Waste Framework Directive 2008/98/EC. The management of waste oils should be conducted in accordance with the priority order of the waste hierarchy and preference should be given to options that deliver the best overall environmental outcome. According to the definition under Article 3(18), the "regeneration of waste oils' means any recycling operation whereby base oils can be produced by refining waste oils, in particular by removing the contaminants, the oxidation products and the additives contained in such oils". Article 21 contains further specific requirements for waste oils.

Based on all the information currently available to the evaluators, it is not possible to conclude that Jensen International follow standards broadly equivalent to relevant international and EU standards, but this issue can be further evaluated during a potential future site inspection.

E-Coli Waste Management Pvt.Ltd.

It is understood that the applicant transfers electronic waste to E-Coli Waste Management Pvt. Ltd. Immediately after the site inspection, the applicant forwarded five different documents regarding E-Coli Waste Management Pvt. Ltd, amongst them two environmental audit reports for Apr 2018-Sep 2018 and for Oct 2018-March 2019, however the annexes to the reports were not attached.

The environmental audit reports were prepared by Gujarat Environment Management Institute. According to these reports, E-Coli Waste Management Pvt. Ltd. is engaged in collection, transportation and primary processing of E-waste. Also, the reports describe that E-Coli Waste Management Pvt. Ltd. forward treated E-waste to recyclers.

In response to the draft report, the applicant forwarded the GPCB authorization and the environmental audit report of E-Coli Waste Management Pvt. Ltd. for Oct 2018-March 2019 from Gujarat Environment Management Institute, including the missing annexes.

According to the license from GPCB, E-Coli Waste Management Pvt. Ltd is authorised to collect, transport and primary process phase 1 E-waste. Specific requirements apply to the process gas emissions from the shredding/crushing machines, noise levels and the ambient air quality.

The environmental audit report (page 27) from Gujarat Environment Management Institute for Oct 2018-March 2019 shows the results of ambient air quality measurements near main office, round 1. The duration of the sampling was 8 hours and the results have been compared to the permissible limit for 24 hours average in the GPCB license. The measured PM_{10} concentration is significantly above the permissible limits of the 24 hours average and the permissible annual limits (respectively 209.04 ug/m^3 vs 100 ug/m^3 and 60 ug/m^3). The measured $PM_{2.5}$ concentration is above the permissible limits of the 24 hours average and the permissible annual limits (respectively 144.06 ug/m^3 vs 60 ug/m^3 and 40 ug/m^3).

Page 28 shows the results of ambient air quality measurements near main office, round 2. The duration of the sampling was 8 hours and the results have been compared to the permissible limit for 24 hours average in the GPCB license. The measured PM_{10} concentration is significantly above the permissible limits of the 24 hours average and the permissible annual limits (respectively 338.41 ug/m³ vs 100 ug/m³ and 60 ug/m³). The measured $PM_{2.5}$ concentration is above the permissible limits of the 24 hours average and the permissible annual limits.

The report states that the limits were exceeded due to civil construction and 'as per the report and attached survey report all the criteria are met, and the results of testing is less than the permissible limit that was set by the GPCB'.

In the report from Apr 2018-Sep 2018, the monitoring results were not attached, hence the evaluators do not have other measurement to compare the results for Oct 2018-March 2019. The ongoing civil construction work was reportedly the reason why the ambient air measurement exceeded the limits. The evaluators have not received any other monitoring reports and it is not known if the ambient air quality was within the limits prior to or after the civil construction works.

The measured emissions from the stack is within the required limit of 150mg/NM³ and the noise measurements show that the observed value is within the permissible limit.

Based on all the information currently available to the evaluators, it is not possible to conclude that E-Coli Waste Management Pvt. Ltd. follow standards broadly equivalent to relevant international and EU standards, but this issue can be further evaluated during a potential future site inspection.

Bharuch Enviro Infrastructure Limited (BEIL)

At the time of the site inspection, the applicant was reportedly transferring mercury waste to Eco Recycling Ltd. After the site inspection, the applicant has changed from Eco Recycling Ltd. to Bharuch Enviro Infrastructure Limited (BEIL).

In response to the draft report, the applicant forwarded several supporting documents in attachment 29a-29g. Attachment 29c includes an expired GPCB license, while Attachment 29d includes a letter from BEIL to GPCB asking for extension of the license. The GPCB license is only a one-page document and does not contain the details provided in other GPCB licenses. Any specific requirements applying to this facility is not provided in this document.

Monitoring reports concerning the operation of the facility could not be found in the forwarded documents.

Based on all the information currently available to the evaluators, it is not possible to conclude that Bharuch Enviro Infrastructure Limited (BEIL) follow standards broadly equivalent to relevant international and EU standards, but this issue can be further evaluated during a potential future site inspection.

REMONDIS SAVA GmbH

According to the waste management table on SRFP page 162-163, persistent organic pollutants are exported to Remondis Sava in Germany. Remondis Sava is certified by ENVIZERT GmbH. The relevant permit is available at the webpages of Remondis Sava. The applicant did not provide information on the treatment method, but by experience the evaluators know that SAVA incinerates hazardous waste. Remondis Sava is assumed to be operating according to relevant EU standards. However, no records of any exports of waste containing POPs were seen during the site inspection.

M/s Recycling Solution Pvt Ltd (RSPL)

After the site inspection, the applicant has reportedly taken membership of M/s Recycling Solution Pvt Ltd (RSPL) located in Panoli, Gujarat. According to the membership letter, this is a mix waste processing facility. The type of waste that the applicant will send to RSPL is not clear from the documentation provided.

The applicant forwarded the GPCB authorisation issued to RSPL. The GPCB authorisation is based on the Hazardous and Other Waste (Management and Transboundary Movement) Rules, 2016, which is the national implementing legislation for the Basel Convention. The authorisation includes several specific conditions, detailed on page 1 and 2. Additionally, specific requirements apply to ambient air quality (provided on page 3).

The applicant forwarded a monitoring report for April 2019-September 2019, prepared by

Shree Dhanvantary college of Diploma Engineering – Kim. Reportedly, this company is nominated as auditor to carry out environmental audit work for the industries falling under schedule - I category by GPCB.

Below are some of the observations and recommendations provided in the report:

- Housekeeping of industry observed poor, therefore it is recommended to maintain the cleanliness by continuous efforts.
- Acidic fumes were noticed during visit near ETP Area.
- Odour nuisance was noticed in industry during first visit, therefore it is recommended to operate ODC system efficiently.
- Separation of particular scrap waste in plant is not visible.
- It is suggested to manage air pollution control measures efficiently considering health risk due to hazardous waste processing.

Any corrective actions taken by the facility is not described in the received documents.

Page 36 of the report shows the ambient air monitoring results for 20.06.2019, for the locations 'Near OHC' and 'Near tanker unloading area'. The results have been compared to the permissible limit for 24 hours average in the GPCB license. The measured PM_{10} concentration is below the permissible limits of the 24 hours average but above the permissible annual limits in both areas.

Based on all the information currently available to the evaluators, it is not possible to conclude that RSPL follow standards broadly equivalent to relevant international and EU standards, but this issue can be further evaluated during a potential future site inspection.

Alang Hospital

It is understood from the SRFP that the applicant transfers medical waste to the Alang hospital. However, details regarding this facility had not been available to the evaluators at the time of the inspection. The evaluators saw neither the relevant permit issued to the Alang hospital allowing it to handle medical waste, nor any further reports on compliance of this facility with the permit conditions.

In response to the draft report of the inspection, the applicant explained that the Alang hospital is authorised to collect bio medical waste and attached a copy of a permit issued by GPCB (valid up to 08.02.2023). The applicant further explained that "the waste collected by Alang-Hospital is transferred to B.M.W.M.C.-IMA who is a body registered under IMA and follows BWM rules 2016 for safe disposal of bio-wastes", and attached a copy of Membership certificate of Alang Hospital from B.M.W.M.C-IMA. Further information was not received, and it is not known to the evaluators how medical waste is treated when disposed.

Based on the limited information currently available to the evaluators, it is not possible to conclude that the Alang hospital/ B.M.W.M.C -IMA follow standards broadly equivalent to relevant international and EU standards, but this issue can be further evaluated during a potential future site inspection.

Customs

Gaseous ODS are reportedly delivered to Customs, while halon is exported, and ODS in solid material is sent to GEPIL, as described above.

Per the Customs Circular no.20/2009, cylinders with ODS can be disposed of to 8 approved refrigerant filling plants, 'provided they are specifically permitted in writing to decant such gases in approved cylinders by the Chief Controller of Explosives. The intimation to this effect may be given to the Director (Ozone), Ministry of Environment & Forest, who will ensure that the corresponding quantity is accordingly debited from the prescribed quota of

the concerned manufacturer'.

The applicant was requested to provide a copy of the permits of the refrigerant filling plants referred to above.

In response to the draft report, the applicant provided the following information:

	Name of refrigerant plant	Website
1	SRF Ltd.	https://www.srf.com/our-businesses/fluorochemicals.html
2	Chemplast Sanmar Limited	http://sanmargroup.com/chemplast.php
3	Gujarat Fluorochemicals Limited	https://www.gfl.co.in/
4	Navin Fluorine Industries Ltd.	https://www.manchesterorganics.com/navin-fluorine
5	BOC India Ltd.	http://www.linde.in/en/index.html
6	Praxair India Pvt. Ltd.	http://www.praxair.co.in/
7	Stallion Enterprise	https://www.zaubacorp.com/company/STALLION-INDIA-
		FLUOROCHEMICALS-PRIVATE-
		LIMITED/U51410MH2002PTC137076
8	Relex Refrigerants limited	http://www.refex.co.in/

The applicant further reported: "We have tried to get the copy of their permits but as we are not direct vendors / subcontractor to them and such they are unable to share them with us. Mostly all of them are multinational companies listed in the stock market."

In the EU, Regulation (EC) No 1005/2009 lays down rules on the production, import, export, placing on the market, use, recovery, recycling, reclamation and destruction of substances that deplete the ozone layer. Per Article 22(2) controlled substances and products containing such substances shall only be destroyed by approved technologies listed in Annex VII or, in the case of controlled substances not referred to in that Annex, by the most environmentally acceptable destruction technology not entailing excessive costs, provided that the use of those technologies complies with Community and national legislation on waste and that additional requirements under such legislation are met.

Based on the limited information currently available to the evaluators, it is not possible to

conclude that gaseous ODS delivered to the Customs Department is treated according to standards broadly equivalent to relevant international and EU standards, but this issue can be further evaluated during a potential future site inspection.

Steel re-rolling mills

It is understood that the applicant is using re-rolling mills to process steel recovered from the ship dismantling process. Details regarding such facilities had not been available to the evaluators at the time of the site inspection. The applicant was therefore requested to provide further details, including a copy of the relevant permits issued to the concerned facilities and additional information regarding their operation (e.g. monitoring reports).

In response to the draft report the applicant forwarded information concerning one facility, the Hans Still Rolling Mill, including their GPCB authorization and a monitoring report for 2019 (ref. Attachments 32a and 32b). It is not entirely clear if the applicant uses further re-rolling mills.

According to the GPCB authorisation, specific requirements applies to the fuel used, water consumption, waste water generation, emissions from the furnace and ambient air quality. For the furnace, the facility is required to report on particular matter, SO_2 and NO_x .

In the EU, the <u>Directive 2010/75/EU on industrial emissions (IED)</u> applies to activities falling under the category of 'production and processing of metals'. These activities are listed under Annex I point 2, and it is required to report on polluting substances in Annex II and for other polluting substances, which are likely to be emitted from the installation concerned in significant quantities (as per Art 14(1)(a)).

The GPCB authorisation appears to cover only a limited number of polluting substances compared to those listed in the IED Annex II, but for SO_2 and NO_x the emission limit values appear to be similar. A GPCB stack monitoring report was also forwarded by the applicant. The results shows that the measured values for particular matter, SO_2 and NO_x were within

the limits. Monitoring reports for ambient air, according to the GPCB authorisation, were not attached.

Based on all the limited information currently available to the evaluators, it is not possible to conclude that steel re-rolling mills used by the applicant follow standards broadly equivalent to relevant international and EU standards, but this issue can be further evaluated during a potential future site inspection.

Further considerations regarding public control over downstream waste management facilities

In order to be able to draw conclusions regarding the extent to which the concerned downstream waste management facilities follow in practice standards broadly equivalent to international and Union standards, the evaluators have also contacted the GPCB to better understand their control and monitoring and enforcement policies.

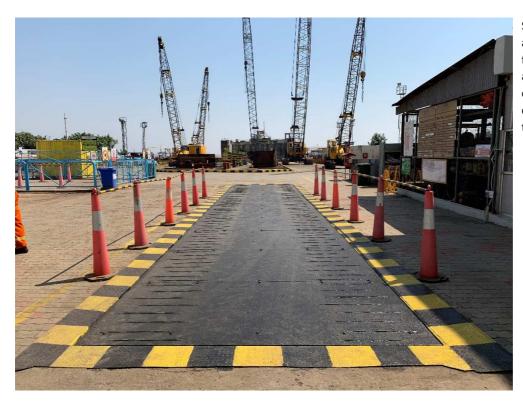
Based on the limited information currently available to the evaluators, it is not possible to conclude that the GPCB is sufficiently equipped to carry out effective controls over the operation of the concerned downstream waste management companies.

During a meeting with the GPCB Bhavnagar office on 14th October 2019, it was explained to the evaluators that GPCB Bhavnagar is responsible to monitor approximately 1500 companies. The GPCB Bhavnagar regional office reportedly has 6 persons responsible to follow up these companies, working in 3 teams of 2 people. The evaluators understand that GPCB officers mainly check waste manifest. Reportedly, the environmental monitoring programs of the waste management companies are not evaluated. The GPCB Bhavnagar regional office is understood to have a risk-based operation where the companies most likely to pollute are checked more frequently than others. The size of the company is also considered.

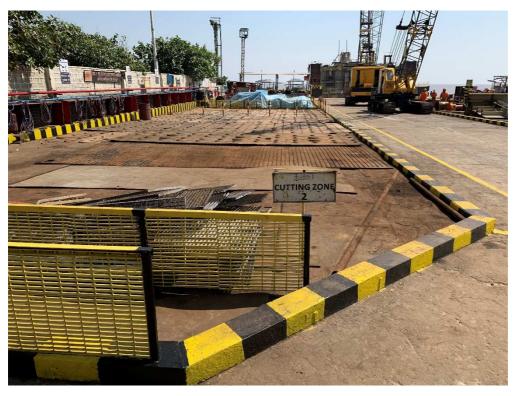
Based on the above, it remains unclear to the evaluators as to whether the GPCB has the

apacity to carry out regular monitoring or inspections of the downstream waste nanagement facilities used by the applicant other than GEPIL.	

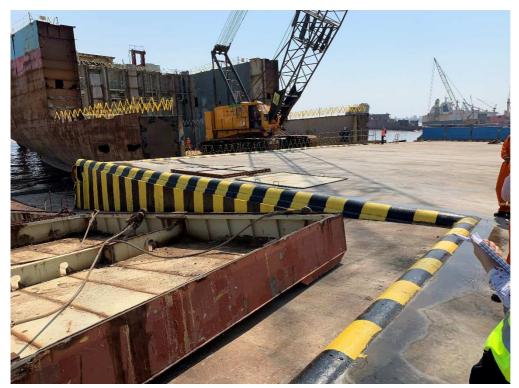
7 PHOTOS FROM THE INSPECTION



Single yard facility. Clear access routes for firefighting and ambulances were observed on-site. Provided cranes are not obstructing the routes.



Oily cutting zone, clear segregation from crane movement zone, with 100mm high curbing marked in black/yellow.



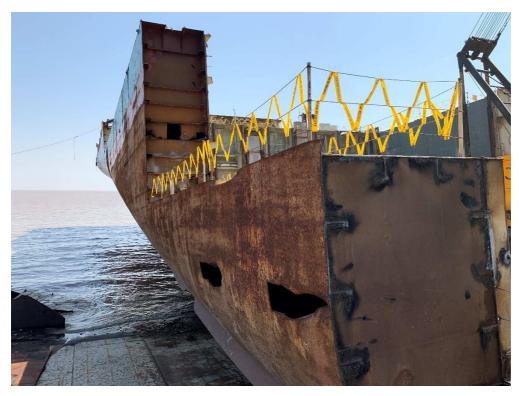
The facility has a parapettype interface with the inter-tidal zone. Drainage is provided by way of hollow pipes with cut-outs allowing ingress of water from the concrete impermeable surface.



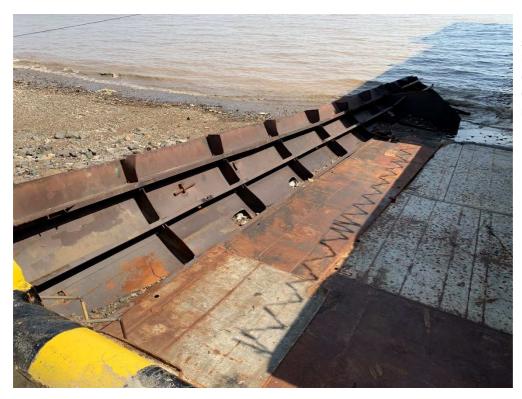
It was observed that the height of the drain lip above the concrete surface was very low in places, and that with few inlets to the drain the ability of the drainage system to handle the expected rainfall and any liquid waste is questioned.



Close up of drain hole. The ability of the drainage system to handle expected water volumes is yet to be demonstrated.



The facility was in the process of dismantling a ship during the site visit. Barrier warning tape was seen in place. Temporary steel plate bulkhead was seen to employed to prevent ingress of water during high-tide. The steel plates covering much of the inter-tidal zone can be seen.



It can be seen that the steel plates protect the inter-tidal zone to some extent, however no drainage system is provided.



under the keel of the ship being dismantled it could be seen a hole in the steel plates.



The facility is a single-yard operation (all activities are performed on the plot – with no back-yard)



The ship being dismantled was generally found to be clean and tidy, with good signage and barriers in place.



Workers' dormitory was found in good condition.



Rooms were clean and well ventilated.



The facility's ambulance service.

APPENDIX 1: Photos from new hospital under development and the firefighting station (March 2019)



The recently opened hospital.



Men's ward.



Female ward.



Burn ward.



Intense Care Unit (I.C.U.) room.



Operation theatre.



The two operational firefighting vehicles at the Fire Station in Alang.



APPENDIX 2: GEPIL

Overview of available waste treatments methods available at GEPIL Alang:

CEPIL PROTECTING FUTURE	GUJAR	ECTION INFRA ST	AT ENVORO PROTECTION INFRA STUCTURE LTD (ALANG-UNIT)
Landfill Cell-1		EFFLUENT TREATMENT PLANT (ETP)	LANT (ETP)
Name:	GLASSWOOL & ASBESTOS CELL	Name:	Effluent Treatment Plant
Capacity	43,038 CuM	Capacity	30 KL per Day
Start Date	October-2005	Construction start	June 2011
Close Date	26th May 2013.	Constructed Completed	April 2012
Type of Waste:	SS & SLF i.e. Asbestos, Glasswool and other landfillable waste	Commissioned on	May 2012
Current Status	CAPPED WITH PRIMARY SOIL	Type of Waste:	Bilge Water and waste water from incinerator contaminated Rain water, Oil block cleaning water
Landfill Cell-2		Landfill Cell 4.1	100
Name:	IND. & CHEMICAL WASTE	Name:	Hazardous Waste Cell
Capacity	10,212 CuM	Capacity	70,000 CuM
Start Date	October-2005	Construction start	June 2011
Close Date	31st Dec. 2011	Constructed Completed	December 2012
Type of Waste: 1	55 & SLF i.e. Glasswool and other landfillable waste	Commissioned on	27th May 2013 - IN OPERATION
Current Status	CAPPED WITH PRIMARY SOIL	Type of Waste:	LANDFILLABLE WASTE. (Mainly Glasswoof and others.) Asbestos is being soldfified in one corner of landfill cell.
Landfill Cell-3		Landfill Cell 4.2	
Name:	Municipal Solid Waste	a Braz	Municipal Solid Waste
Canadian	6 732 00 C:84	1	1000 OE
Start Date	October-2005	Construction start	lime - 2011
Close Date	In Operation	Constructed Completed	December- 2012
Type of Waste:	Municipal Solid Waste	Commissioned on	Commissioned but not in operation as existing cell is in operation
Current Status	In Operation	Type of Waste:	Municipal Solid Waste
		Current Status	Not In Operation
INCINERATOR		Salient Features of Incinerator Design	erator Design
Name:	Incinerator	Design Capacity of 5 MT/Day	
Capacity	5 MT PER DAY	 Design developed in association with M/s Westland, Canada 	on with M/s Westland, Canada
Construction start	April 2013	Capable of Incinerating Solid/	 Capable of Incinerating Solid/Semi Solid/Liquid Hazardous Waste
Constructed Completed	October2013	Temperature of more than 80	 Temperature of more than 800 Deg C in Primary & 1100 Deg C in Secondary chambers
Current Status	In Operation	Total residence time of flue ga	 Total residence time of flue gas > 2 seconds in secondary chamber and Breach ducts
		 Two stage scrubbing system f 	 Two stage scrubbing system for effective cleaning of flue gases
Tune of Wester	Incinorable Waste / Callel comicalle & leading	■ DRE ~ 99.99 %	
יאות כו אופסובי	ווירוופו סחופ אפזרב ל פסומל פבנוופסוום מי וולחום	 Emissions as per CPCB Norms 	
		Online flue gas analyzer for m	 Online flue gas analyzer for monitoring the stack gases round the clock
Fire Hydrant System		Intermediate Storage	
Tank Capacity	2,00,000 ltr	Use	To store Incinerable Waste (solid ,semi-soilid & liquid) Capacity : 1000 MT
Status	In Operation.	Status	In Operation

Photos from GEPIL – Incinerator, landfill, effluent treatment plant, tank truck and trucks.

Incinerator

Incinerator building





Incinerator with primary (lower chamber) and secondary combustion chambers.



Venturi scrubber

Landfill



Landfill Cell 4.1: Hazardous waste cell



Landfill Cell 4.1: Hazardous waste cell Asbestos is solidified in one corner of the landfill cell.



Landfill Cell 3:

Municipal solid waste



Leachate sump

Effluent treatment plant



Water samples taken from different stages of the treatment process.



Sludge drying beds

GEPIL tank truck for liquids (bilge, ballast water, oily water, storm water)



GEPIL trucks



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