

Annex – Alang

Responsible Ship Recycling Standard “RSRS”

Version: April 2016

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Annex A.1

Relevant Requirement

A.1 Facility management and Company information

The SRF shall provide information regarding the organizational structure and management policies, an overview of the SRF, and methodologies related to ship recycling.

Additional Explanation

The organizational structure of the SRF has to reflect responsibilities and decision making abilities of key persons. Due to the manifold aspects to be coordinated and documented, a HSE Department, or at least a HSE manager, is inevitable for ensuring compliance with RSRS. The following table provides examples of activities of managing and working staff of a SRF in Alang/India. Anybody involved in ship recycling has to proof sufficient qualification and knowledge which has to be controlled by SRFs. Proof is to be provided during the evaluation process for SRFs participation in RSRS.

Type: Management Level, Office and management staff	Activities
General Manager	Responsible for the overall operation of the SRF and ensures that any activity of the SRF or contract entered into is in compliance with the SRFP and other relevant requirements. He is in overall charge for execution of the Code of Practice.
Production Manager	Responsible for the overall production of the SRF, including repair and maintenance of equipment and machinery, workshop.
HSE Manager Health & Safety Officer Environmental Officer HazMat Expert	Responsible for ensuring compliant activities within the HSE Requirements including safe for entry and safe for hot works certifications, nomination of competent person(s) which have to have sufficient trainings, experience, and qualification for the different HSE tasks, e.g. HM training, specific record management.
Operating Officer	Responsible for planning the cutting of blocks, determination if blocks are clean / dirty and preventing harm due to deleterious paints.
Business Manager	Responsible for accounting and bookkeeping, purchasing and trading of materials, contract management with external companies and individuals, general record management.

Annex A.1

Type: Workers, Field workers	Activities
Supervisors	Supervising the activities under their specific responsibility
Cylinder Handlers	Transportation of oxygen and LPB bottles
Electrician	Electrical works
Workshop Manager	Maintenance of machinery and equipment
Welder	Maintenance of equipment
Cutter	<ol style="list-style-type: none"> 1. Cutting of blocks 2. Working zone (1st, 2nd, 3rd Cutting zone area) 3. May come into contact with hazardous substances 4. Maintenance of equipment such as hoses, bottles connectors, torches
Winch Operator	Operation of winches
Crane & forklift operator, truck driver	<ol style="list-style-type: none"> 1. Lifting operation of blocks and plates 2. Maintenance of cranes 3. General oversight (e.g. oil spills) 4. Working zone (1st, 2nd, 3rd Cutting zone area and/or storage area)
Helpers	<ol style="list-style-type: none"> 1. Assisting all the gas cutters on yard 2. Provide feedback to Workshop Manager in charge
Wire rope handlers	<ol style="list-style-type: none"> 1. Close co-ordination with winch operators 2. Handling of wire ropes during pulling of vessel 3. Pulling of vessel blocks to fall in the vessel for environment protection
Housekeepers	<ol style="list-style-type: none"> 1. Collection of all small pieces of metal on yard 2. Collection of all unidentified material on yard 3. Spraying of water on yard during tea breaks
Non-Ferrous Handlers	<ol style="list-style-type: none"> 1. Collection and segregation of different heavy material containing material on yard 2. Breaking of various material to recover heavy metal in non-ferrous storage room 3. Transfer of recovered heavy metals in safe location on yard
Plate handlers	<ol style="list-style-type: none"> 1. Storage of plates on yard as per size and dimensions 2. Loading of plates in trucks 3. Coordination with crane driver and helper for storage of plates on yard
Loaders	<ol style="list-style-type: none"> 1. Loading of plates from yard to truck 2. Storage of plates based on convenience of loading in truck
Drivers	<ol style="list-style-type: none"> 1. Driving and operation of cranes 2. Regular maintenance of cranes and winches on yard
Decontamination worker	<ol style="list-style-type: none"> 1. Identification of hazardous material on board based on IHM 2. Planning and removal of HazMat on board 3. Storage of material in HazMat storage go down 4. Transport of hazardous material
Oil cleaner	<ol style="list-style-type: none"> 1. Laying of pipes from ship to yard for collection of materials 2. Setting up of oil removal pump on board and yard 3. Setting up intermediate oil collection container on yard

Annex A.1

Type: Special Positions	Activities
Fire Fighting	<ol style="list-style-type: none"> 1. Firefighting is designated to trained workers 2. Mock drills conduct regularly 3. Familiar with general procedures of firefighting and equipment 4. Take actions based on mock drill and review firefighting equipment on regular basis
1st Aid	<ol style="list-style-type: none"> 1. Ensure that first aid kits are available on yard and on board 2. Regular training on first aid 3. Monitoring of first aid incidents and take actions based on incident analysis
Security	<ol style="list-style-type: none"> 1. Enter visitor details in visitor register 2. Brief to visitor on safety concerns in different areas of yard 3. Check all visitors 4. Check on prohibition of flammable items inside SRF
ACM Removal	<ol style="list-style-type: none"> 1. Setting up of decontamination zones on-board a ship 2. Working in negative pressure decontamination zones in SRF 3. Removal of ACM from the ship and packing 4. Storage of ACM in asbestos storage room
New workers	Depending on their assignment, includes also workers which are carrying out minor or short term tasks within the SRF

Annex A.2

Relevant Requirement

A.2 Training programme

The SRF shall provide detailed information on the general workforce and job functions and on training procedures to ensure the appropriate level of worker safety and environmental protection.

Additional Explanation

Training of all staff is essential for ensuring HSE compliant practices and following RSRS.

A comprehensive training program has been developed for the recently ClassNK-certified SRFs in India. As the implementation naturally takes time and not all trainings are available or have been conducted fully yet, it has to be understood as a continuing process. Therefore the evaluation of training programs already implemented by SRFs should focus on the completeness of trainings planned and which are under conduction. When applicable, this could be used for follow-up activities and improvements as well as for benchmarking of SRFs. At least all staff must have received basic safety trainings and familiarization with their workplaces prior to commencing any activity inside the SRF. All other trainings or familiarizations for different types of staff which are mandatory to have been conducted prior to delivery of the first ship are marked in red in the training overview.

Number	Training Title
1	General Safety Introduction <ul style="list-style-type: none"> a. personal protective equipment b. general hazard awareness c. emergency and evacuation
2	Handling and management of hazardous materials <ul style="list-style-type: none"> a. awareness and communication of information about hazardous materials b. job hazard awareness c. identification of HazMats (IHM Professional)
3	Fire protection and prevention <ul style="list-style-type: none"> a. emergency response and evacuation b. evacuation coordinator c. fire fighting
4	First aid <ul style="list-style-type: none"> a. safety and health training b. first aid awareness c. first aid and rescue
5	Oil spillage on sea and plot <ul style="list-style-type: none"> a. environmental and safety monitoring b. environmental awareness
6	Gas cutting operation <ul style="list-style-type: none"> a. safe for entry b. safe for hot work c. welding, cutting, grinding and heating
7	Working at height

Annex A.2

Number	Training Title
8	Confined space entry, SCBA a. working in oxygen deficient areas b. working in a flammable environment c. working with toxic residues
9	Removal of ACM
10	Crane and forklift operation, truck drivers
11	Batteries handling procedure
12	Mock drills like: Firefighting, Evacuation drill, 1st Aid, Oil or Chemical Spill Drill in water / on land

Type: Management Level	Training											
Office and management workers	1	2	3	4	5	6	7	8	9	10	11	12
General Manager	X											X
Assistant General Manager	X		X									X
Production Manager	X	X	X									X
HSE Manager	X	X	X	X	X	X	X	X	X	X	X	X
Business Manager	X		X									X

Table 1: Training Matrix for Management Level

Annex A.2

Type: Workers, Field workers	Training											
	1	2	3	4	5	6	7	8	9	10	11	12
Supervisors / Mukadam	X	X	X	X	X	X				X	X	X
Supervisors / Master	X		X	X								X
Cylinder Handlers / Battla - Wallas	X		X									X
Electrician	X		X									X
Workshop Manager	X		X									X
Welder	X		X				X					X
Cutter / Batti - Wallas	X	X	X			X	X	X				X
Winch Operator	X		X		X					X		X
Crane & forklift operator, truck driver	X		X							X		X
New workers	X		X									X
Helpers / House keepers	X		X							X		X
Wire rope handlers / Jodi-Wallis	X		X		X							X
Wastehandlers / Begari - Wallas	X		X								X	X
Non-Ferrous Handlers / Mall-Pani-Wallas	X		X								X	X
Plate handlers / Plate -Wallas	X		X									X
Loading - Wallas	X		X									X
Drivers	X		X							X		X
Decontamination worker	X	X	X		X			X				X
Oil cleaner	X	X	X		X			X				X

Table 2: Training Matrix for Field Workers

Type: Special Positions	Training											
	1	2	3	4	5	6	7	8	9	10	11	12
Fire Fighting	X		X	X								X
1stAid	X		X	X								X
Security	X		X									X
ACM Removal			X						X			X

Table 3: Training Matrix for Special Positions

Additionally the proposal of ILO to provide training on biological hazards like infectious diseases, bites by animals during medical checks and on clean conditions (for private application and in related areas of the SRF itself) can be considered.

Annex A.4

Relevant Requirement

A.4 Records management

The SRF shall provide the policies and procedures for retaining vital records associated with SRF operations and, specifically, the recycling of each ship.

Additional Explanation

Training and HSE related reports are to be prepared on a regular basis (daily, weekly, monthly, seasonally or yearly).

The SRF is entitled to request copies for desktop review or check these during inspections. The following documents for the HSE Reporting under RSRS are required as a minimum and examples to be provided by the SRF for their acceptance under the RSRS:

No.	Content	Parameters, comments	
1	Environmental analysis reports	Noise	Decibel
2		Sea sediment	Heavy Metals, Oil, paints, chemicals, other hazards
3		Air	Dust, Soot particles, gazing chemicals, other hazards
4		Soil	Heavy Metals, Oil, paints, chemicals, other hazards
5		Drinking Water	Suitability for human consumption
6	Employees	Health check	Prior job start and during job
7		Safety	Recording of diverse safety inductions incl. PPE and work related trainings
8		Maintenance	Maintenance of safety equipment
9		Sickness absence rate	Incident Reporting, accident at work with sick leave or without, permanent injuries or sicknesses
10		Communication	Documented communication with neighbours in case of dangerous situations e.g. falling blocks into sea and neighboured area, hazardous gas cloud, in-house communication and meetings
11	Dismantling equipment	Maintenance and repair works	Maintenance Intervals according to manuals, Visual checks for e.g. ropes, winches, hooks, traverses, chains, slings, hoisting equipment
12	Suspicious materials	Identification	Survey, evaluation and analyses prior dismantling
13	Disposal Management	Monitoring	Manifests for disposal of wastes and hazardous wastes incl. transportation
14	Incident Reports		A standardized form for recording events causing safety or environmental hazards in the SRF. This shall include full investigation and necessary remedial actions

Annex A.4

No.	Content	Parameters, comments
15	Training Program	<p>The SRF should ensure training for the following:</p> <ul style="list-style-type: none"> - General Safety Introduction - Handling and management of hazardous materials - Fire protection and prevention - First aid - Oil spillage on sea and plot - Gas cutting operation - Working at height - Confined space entry, SCBA - Removal of ACM - Crane and forklift operation, truck drivers - Batteries handling procedure - Mock drills like: Firefighting, Evacuation drill, 1st Aid, Oil or Chemical Spill Drill in water / on land
16	Confined Space Check and Entry permit	to be kept for at least three month after finishing related work
17	Hot Work Permit	

Annex A.5

Relevant Requirement

A.5 Facility operation and Facility information

The SRF shall demonstrate an understanding of the regulations, production processes, project management and other requirements associated with performing recycling operations in accordance with applicable laws and regulations, and demonstrate how the SRF plans to prevent adverse effects to human health and the environment.

Additional Explanation

The SRF layout and equipment has to allow ship recycling in a safe and environmentally sound manner and allow conduction of and compliance with all procedures and descriptions in the SRFP. This requires consideration of the layout, equipment and the operational aspects.

Working Areas

All working areas are to be illuminated for ensuring safe working conditions when natural light is not sufficient. This also applies to working areas on-board and inside the ship. In cases where illumination is only required for a very short time and impossible to be established, the use of torches is permissible.

Oily Handling Area / Impermeable floor

Impermeable floors and effective drainage systems shall prevent environmental pollution caused by leakages, e.g. during dismantling works or crane operation. They are obligatory and to be located at an area, where handling of contaminating materials may take place. In general the gap between the ship and impermeable area of the SRF should be as small as technically possible.

In cases of handling of contaminating materials the gap has to be protected from pollution. This can be achieved by:

- Full cleaning of materials to be handled prior to landing them onshore
- Coverage of sandy gap
- Placing material in a secondary containment

Key requirements for impermeable floors are separation of impermeable from permeable areas of SRF. For effective waste water management and reducing volumes of contaminated water, the following should be considered in combination with specific plot details:

- Channelling of water around dirty zones & drainage system by separating these zones
- Cover oily block and oily material areas or place them in steel crates
- Driveways and other clean areas separated from impermeable areas

An impermeable area can be achieved by sealing of the natural and unprotected soil. Two options exist, sealing by concrete floor or with Geocomposite, which is also an improvement option). Both systems are to be equipped with a drainage system for collecting the pollutants (liquids) and delivering waste waters to a storage tank for later treatment and disposal.

Annex A.5

Drainage system and waste water collection

During monsoon season, the mixture of rain water with oil or other chemical pollutants must be avoided. Therefore a separation between clean rain water and contaminated water is necessary in form of a drainage system ending in a storage tank. Logically, clean water can flow directly into the sea, but contaminated water is to be stored, treated, and/or disposed of separately. Contamination can be avoided or minimized by:

1. Construction
 - Lifted impermeable / concrete floor
 - Drainage system
 - Grease trap at storage tank
 - Sheds or tarpaulins for covering winches and/or oily equipment (e.g. wire ropes) for avoiding / reduction of contamination
 - (Steel) crates to border oily parts like a catch basin

2. Monitoring weather forecast for timely preparations

Onshore

- Cleaning and inspection of dirty areas of SRF
- All parts which may be blown away by storms are to be secured
- Tarpaulins to cover oily machinery (e.g. during storage) and equipment (e.g. winches)
- The drainage system is cleaned from oil and sediments, also the grease trap
- Water is channelled from the road around the SRF / working areas, if required temporary water barriers in form of sandbags are put into place
- Winches are protected against flooding with sandbags and tarpaulins
- The oil spill kit is kept on standby
- Waste water stored in storage tank is disposed of for having available maximum tank capacity

On board

- All doors or openings are closed
- Oily areas are cleaned up and covered if possible, e.g. tarpaulins
- If openings in the hull are nearly on sea water level, they are closed to avoid incoming sea water
- The ship is to be secured against drifting

Calculation of waste water capacity

The SRF has to provide their calculation of the minimum waste water storage capacity taking into consideration the following parameters:

- Statistical weather data (focus on monsoon season)
- Impermeable floor size
- (Maximum) Rainfall per day
- Duration of tank storage until discharge
- Frequency of checks / maximum duration w/o checks
- Operational aspects of waste water management

Due to application of organizational measures the required waste water holding capacity can be reduced. An example for the general calculation of the drainage system capacity without consideration of operational measures is shown in the table below:

Size of drained area		Rain Fall [mm]	Duration [days]	req. Tank volume [m ³]*
width [m]	length [m]			
50	50	22.5	1.5	84.4

* as indication only, tank volume can be less

Annex A.5

Improvement option

Use of airbags

This technology is already in use for launching new built vessels and by repair yards.

The operation of airbags is suitable in sandy areas and is independent from tides but under condition of a “levelled” beach slope without hard materials to avoid damages to the airbags. There are no limits towards ships’ type, size and launching weight. Also the demand low maintenance efforts and operational costs. Additionally repeated use and a short preparation time are other advantages.

The use of airbags offers the SRF to position the vessel higher on plot by its length for dismantling, ideally fully accommodated. This option enables the recycler to cut the vessel alongside above the impermeable floor considering the increased accessibility to ships’ structures and components, e.g. to tanks and their cleaning. It also provides workers with a safer working environment, e.g. by enabling them to use access towers and installation of scaffolds.

Operation with Airbags:

After landing of the ship on top of airbags these are filled with compressed air, e.g. by using compressors from recycled vessels by SRFs.

After inflating of airbags the SRF can position the vessel more freely with less winching power and bring it further up into the plot and directly on top of the impermeable floor. Depending on size of SRF the ship can be winched up to accommodate the length of where dismantling is carried out or up to fully accommodating the ship.

This enables the recycler to cut the vessel alongside and take advantage of increased accessibility to the ship including tanks and their cleaning.

Annex B.4

Relevant Requirement

B.4 Prevention of adverse effects to human health

The SRF shall establish and utilize procedures to prevent explosions and / or fires by ensuring that Safe-for-hot-work and Safe-for-entry conditions are established and maintained throughout the ship recycling process; to prevent other accidents that cause or have the potential to cause damage to human health; and to prevent spills of cargo residues and other materials which may cause harm to human health and/or the environment.

Additional Explanation

Block Handling

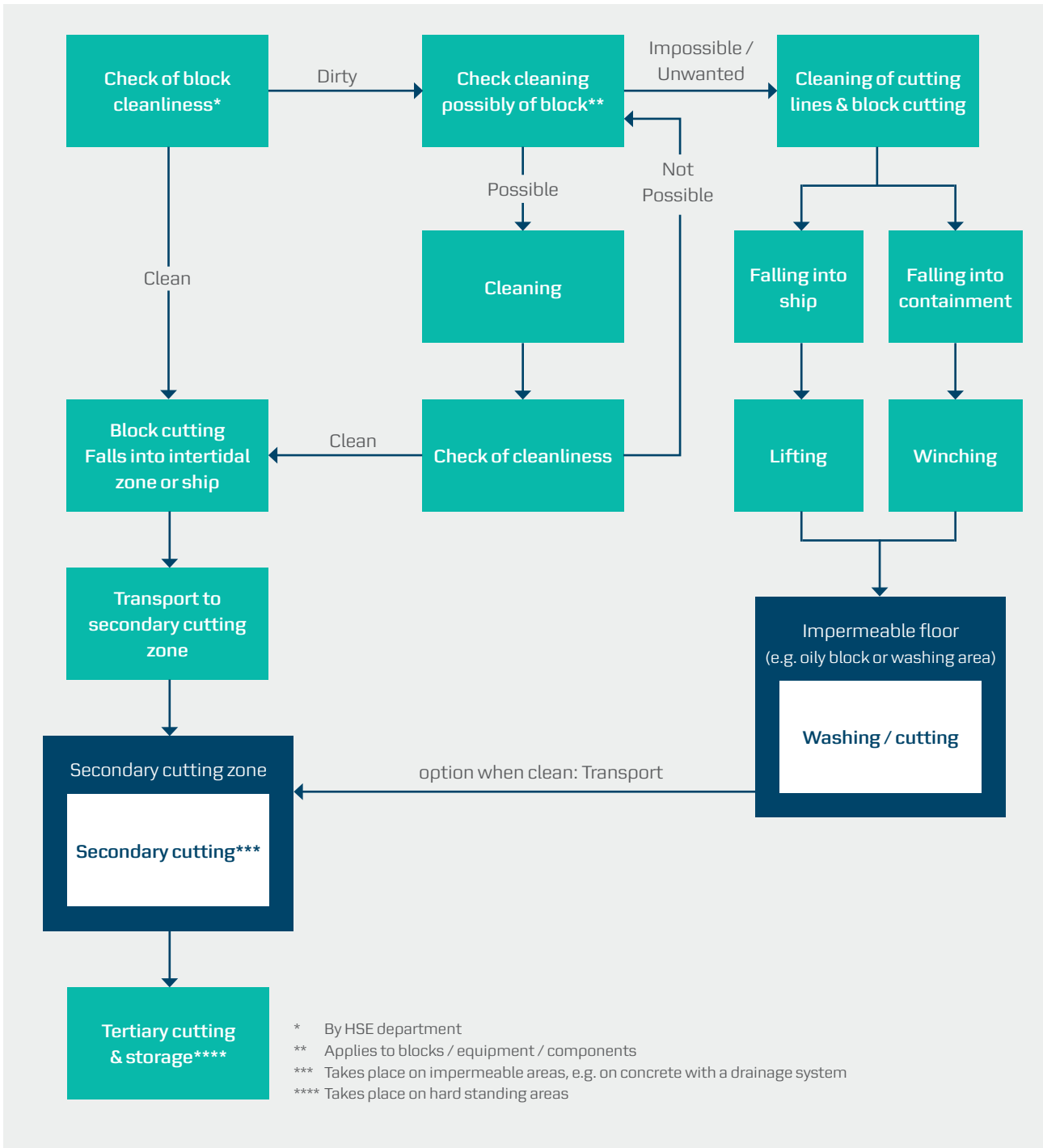
One of the most criticized aspects of the beaching method is the “dismantling by gravity”. Here big steel blocks are cut out of the ships’ structure and fall into the intertidal area. Some preventive measures and changes in the primary cutting operations can limit safety / environmental impact and associated risks. Starting point is a risk assessment to be conducted during the draft of SRP, deciding whether blocks fall inside or outside the ship, taking into account both safety as well as environmental risks, where safety risks will prevail.

Primary cutting is conducted under consideration of all following precautions:

1. Potential adverse effects on the environment caused by paint chips in the soil or water are minimized by:
 - Removal of deleterious paints
 - Using pipes underneath clean blocks when those are winched further onshore
 - Let blocks fall inside the ship whenever possible

2. Application of oily block handling and inspection procedure:
 - Any block with a little of oil, machinery and hazardous waste is to be treated as dirty block under the supervision of the responsible person
 - Treatment procedure to be established, implemented, and recorded in cleanliness inspection report form
 - Any dirty block and machinery is not to be placed at intertidal zone
 - Dirty block and machinery to be transferred with proper spill prevention to impermeable floor.

Annex B.4



Annex B.4

Safe management of falling blocks

Generally it is preferred to let blocks fall inside of the ship. Handling of oily and contaminated blocks is following the procedure on the right. The inspections are to be carried out jointly by HSE-Manager and responsible supervisor. The inspections are relevant for all blocks which fall outside of a ship / into the intertidal zone or any other permeable floor.

Blocks which fall inside ship

Dangerous areas on-board are signed with warning signs such as barriers or pylons. The cutting operations and area where the block or material might fall to is under special surveillance of a supervisor nominated during the morning meetings and oversees the entire preparation and operation.

Block which fall into intertidal zone

Standard procedures for communication are to be followed. The area between the ships is a restricted area and a barrier is placed towards the shoreline for avoiding unauthorized access by any worker. During low tide a barrier is also placed towards the aft of the ship to inform workers coming from the seaside to not enter this area.

Winching of blocks

During winch operation or pulling of blocks towards onshore it is not allowed to work in this area, neither in the area where a block could fall onto nor in vicinity of stressed ropes. During winching of big blocks, no worker is permitted to enter the area between winch and ship or the pulled block.

Communication with neighbours

Some activities might have an effect on other SRFs nearby, e.g. falling of blocks. For preventing adverse effects for external workers the SRF should inform potentially affected facilities prior to starting work. The managers of other facilities are asked to confirm receipt of information in writing and to inform their employees and take precautions accordingly. Depending on positive decision of neighbouring SRFs, they should apply the same procedure for own employees and inform other potentially affected SRFs as well.

Falling from height

Falling from heights has the potential to cause severe injuries or casualties and is to be effectively prevented on-board as well as onshore.

– Offshore: Primary cutting zone

To protect falling from height workers wear a waist belt which is connected to a safety rope and fixed to the structure of the ship. Any item which is in vicinity of heights is secured against falling or lead down in a controlled manner. Work places at heights on edges are properly illuminated and marked. Marking and securing is an ongoing effort due to constantly changing edges and areas on-board a ship which is recycled, therefore lightweight barricades are acceptable.

– Onshore: Secondary cutting zone

Same preventive measures apply as for first cutting zone for all working areas with a height above 2 meters. Up to 2 meters a ladder can be used but generally protective measures depends on working and surrounding conditions like safe stand of ladders as well as national requirements with regards to securing materials and application of PPE.

Annex B.22

Relevant Requirement

B.22 Drums, containers and pressure vessels

The SRF shall ensure procedures for handling, transporting and storing pressure vessels containing flammable gases, such as acetylene (C₂H₂), propane gas (C₃H₈) or oxygen (O₂) for welding, heating and cutting works, in order to avoid any human injuries, caused by external forces, shock or heat to such vessels. As well as procedures for removing pressure vessels containing carbon dioxide (CO₂), nitrogen (N₂) and other ozone-depleting substances used in fire-fighting and refrigeration systems shall also be included. Procedures for transporting and storing drums and containers containing hazardous liquids, using appropriate PPEs, shall also be described by the SRF.

Additional Explanation

Compressed gas cylinders are under high pressure. By improper handling of compressed gas bottles, there might be an increased danger of fire, explosion and risk of accidents. Therefore, the following safety precautions when using pressurized bottles are applied.

For the prevention of mixing gas cylinders and connecting cables different gases have different connectors and hoses have different colours. Acetylene cylinders are connected with a strap closure, oxygen cylinders connected with a normal right hand thread.

General handling of compressed gas cylinders

- Gas bottles are protected against overheating (e.g. direct sunlight or nearby hot works)
- Storage and transportation is carried out with valve cap attached
- Gas cylinders are fixed during transportation
- Gas cylinders are secured at workplace against falling
- Transport and storage is done in an upright position
- Gas bottles or the cages are in are marked in a specific colour
- It is prohibited to let gas bottles fall or to pull them at cylinder valves
- Carrying of gas bottles (i.e. on a shoulder) should be avoided
- Bottles are to be stored in well ventilated areas which are sun protected
- Connectors, valves and hoses are checked for leakages prior to using them
- No gas is used from lying gas bottles

Annex B.22

Gas specific precautions are to be identified.

An example for oxygen cylinder handling and safety instruction is provided below:

- Properties of oxygen which require precautions:
 - * Not combustible, but combustion-supporting
 - * Creates a strong chemical reaction with strong heat development
 - * May explode when oxygen cylinder is under high pressure and over heated
 - * Contact with gas or liquefied gas may cause burns, severe damage and (or) frostbite
 - * Non-combustible materials in air may spontaneously burn in connection with oxygen or oxygen-enriched air
 - * An excessively high oxygen content in the air may damage lungs
- Connections points are to be grease and fat free (spontaneous combustion)
- Oxygen cylinders are connected with a normal right hand thread
- Specific safety instruction for workers:
 - * Only trained workers are authorized to use oxygen
 - * The misuse of oxygen, such as cooling and improving the ambient air, cooling and dusting, blowing at people, clothing, equipment, etc. is prohibited
 - * After a stay in an oxygen-enriched atmosphere, clothes are thoroughly ventilated due to adherent effect (ignition source such as a cigarette may cause fire on clothes)
 - * Gaseous oxygen or ambient air with increased oxygen content causes increased fire hazard and special precautions are to be taken
 - * Oil and grease (also ointments and gels) may burn in reaction with oxygen
 - * Oxygen increases flame temperature and speeds up combustion/cutting work
 - * If a leakage is detected, the nearest valve is closed and the hot work is stopped immediately.
All workers leave the area and go directly to SRFs assembly point.
 - * After that, a supervisor checks the air by a gas detector before workers re-enter location to continue.

Annex B.24

Relevant Requirement

B.24 Gear and equipment for rigging and materials handling

The SRF shall ensure procedures for testing and inspecting ropes, chains, slings, hooks, chain-falls and hoisting and hauling equipment. It shall further include a description of operations using cranes, machines, mobile equipment and aerial and man-lift systems and a list of qualifications required for the operators.

Additional Explanation

Excessive workload and awkward postures for the workers should be avoided for ensuring their well-being. Therefore the following should be considered:

- Use of machinery for truck loading activities (e.g. fork lifts, magnetic cranes)
- Reduction of use of oxygen and LPG-containers (e.g. safe transportation of cylinders in crates by cranes)
- Prevention of awkward positions (by e.g. longer torches for cutting operations)

Storage of plates

- All plates are clean and tidy from oil and chemicals if stored on sand
- Oily or contaminated plates are to be stored on top of an impermeable floor without any leakage to unprotected soil
- Care is taken against slipping of plates during stacking or unloading
- Tubes, pipes and moulded parts are stored separately
- Stacks are made in a way that they are stable, too many plates in a stack are avoided
- The traffic roads are kept free from stored parts or steel plates
- No plates reach into traffic areas
- Roads are kept in a drivable condition
- An instructor guides the crane driver on how to handle and load / unload plates or other materials stored
- No worker enters the storage or loading / unloading area unless it belongs to his job

Loading area

- The traffic roads are kept in good and safe conditions
- Traffic roads are marked and signed
- The storage instructor checks trucks before they are loaded regarding their technical conditions (condition of all wheels, function of lights, trucks' structure/chassis is capable to carry heavy loads)
- The storage instructor is responsible for the right loading
- Securing of cargo by the driver is checked
- Speed limit on the yard is 5 Km/h

Annex B.27

Relevant Requirement

B.27 Personnel protective equipment

The SRF shall ensure procedures and equipment used for the protection of employees from various risks associated with ship recycling. Respiratory protection and hearing conservation programmes shall be developed for all employees who could be exposed to excessive levels. The SRF shall describe how the programmes are in compliance with national regulations. In the absence of domestic law, the SRF shall utilize best industry practices to provide effective respiratory protection and hearing conservation programmes.

Additional Explanation

Appropriate selection and application of PPE accommodating requirements of OHSAS18001 and/or SA8000 is essential for ensuring a healthy and safe working environment.

Any work wear has to be flame and tear resistant and current charging retardant (Flame Resistant work wear – FRW). The clothes are to be kept clean and tidy. Workwear contaminated with flammable, hazardous or biological agents are taken off and are to be cleaned.

Workwear should generally not be tight-fitting, a layer of air between the fabric and the skin provides additional insulation against heat. In general selected PPE should consider the extreme temperatures in India and also noise associated with ship recycling activities.

Personal Protective Equipment is to be worn by any person who enters the working areas of the SRF.

The following licensed PPEs are required:

- Safety or solid shoes
- Safety vest
- Safety helmet
- Safety glasses (especially in case of getting close to cutting operations)

Working clothes have additional characteristics like:

- Flame retardant
- Tearproof
- Fluorescent stripes
- Good wearing comfort
- Useful bags / belts for security equipment and tools as required
- Chemical resistant
- Anti-static

PPE is selected based on industry standards and applicable national legislation as well as job hazard assessments according to the table on the right which provides an overview of the minimum PPE for the different job types.

The minimum stock of PPE to be kept by the SRF should be lasting for at least 2 weeks of continuing operations and take into account the number of workers demanding PPE according to the above table.

Improvement option

Safety helmets with company logos can additionally be marked or in different colours reflecting roles, responsibilities and types of workers according to the following scheme:

- Green stripe with signs for first aiders
- Red stripe with fire fighter symbol for firefighting team
- Yellow stripe for labourers
- Blue stripe for supervisors
- Black and white stripe for staff and visitors
- Other stripes depending on further job roles

Annex B.27

PPE Selection Based on Hazard Assessments										
Type of work	Cover all	Helmet	Safety Shoe	Dust/Filter Mask	Safety Harness	Goggles	Chemical/ Normal Gloves	SCBA	Disposal Suit	Battery Operated Respirator
Oil Removal	●	●	●	●	●	●	●	●	●	●
Oil Tank Cleaning	●	●	●	●	●	●	●	●	●	●
Removal of insulating material (glass, wool, puff etc.)	●	●	●	●	●	●	●	●	●	●
Asbestos removal	●	●	●	●	●	●	●	●	●	●
Paint chips removal	●	●	●	●	●	●	●	●	●	●
Confined space	●	●	●	●	●	●	●	●	●	●
Gas cutting	●	●	●	●	●	●	●	●	●	●
Welding work	●	●	●	●	●	●	●	●	●	●
Grinding work	●	●	●	●	●	●	●	●	●	●
Machinaries removal	●	●	●	●	●	●	●	●	●	●
Chemical handling	●	●	●	●	●	●	●	●	●	●
Working at height	●	●	●	●	●	●	●	●	●	●

COLOUR CODES: ● At All Times ● As Required ● Not Required

Annex B.29

Relevant Requirement

B.29 Emergency preparedness and response plan (EPRP)

The SRF shall establish and maintain a robust emergency preparedness and response plan (EPRP).

Additional Explanation

The SRF has to proof that it can manage emergencies with their own equipment to a certain extent. Therefore the below listed equipment is required:

Fire Fighting Equipment

Onshore firefighting equipment

- Fire pump with a tank
- Hose length up to aft ship
- A few extinguishers with powder or foam.
- A few sand buckets
- Work wear:
 - * Fireproof jacket
 - * Helmet with visor
 - * Gloves
 - * Set of breathing protection with pressure air (bottle)
 - * Communication systems

Offshore firefighting equipment

- Diesel engine driven fire pump
- Sufficiently long hoses
- Respiratory protective devices
- Work wear:
 - * Fireproof jacket
 - * Helmet with visor
 - * Gloves
 - * Set of breathing protection with pressure air (bottle)
 - * Communication systems

Clothes and related firefighting equipment are available in firefighting station / storage room onshore and in the emergency kit on-board. All fire-fighting appliances and equipment are to be used only for emergencies. They are to be stored in separate areas which allow easy access. Available firefighting arrangements are to be shown in the layout plan.

1st Aid in SRF onshore

The SRF has to proof that it is prepared for emergencies and has access to first aid treatment, an ambulance and a hospital lies within the vicinity of the SRF and can be called in for assistance at any time.

First aid costs are covered by the yard and names of first aiders are recorded. More serious emergencies are dealt with by external city / public services. Emergency numbers are to be displayed for each worker at visible points at SRF.

The SRF provides a first aid room which is equipped as follows:

- Transport stretcher
- Day bed which stands in the middle of the room or in a position which allows the first Aid personnel to surround it for medical treatment
- Plasters, disinfectants, sterile bandages and pressures pads for single use
- Blanket and rescue blanket
- Disposable gloves
- Drinking water

Annex B.29

Other requirements for first aid room:

- Always in a clean condition
- Wall colour is bright
- Well illuminated and ventilated
- Sink with cold and hot water and soap
- Available hand disinfection
- Wide entrance door
- First aid rescue flow chart/ processes e.g. having up on wall to give quick information by help of pictures etc.

1st Aid on-board

During the entire recycling process first aid and evacuation equipment is to be stored on-board:

The Emergency Equipment Kit is stored at aft ship on lowest possible point / open deck during whole recycling process.

It and contains the following items:

- Life raft (from the ship to be recycled if in good conditions)
- Life vests (no. of potentially affected workers)
- Pilot ladder or safety net (in storage onshore 10m, 20m, 30m long, combined which each other to be as long as necessary for safe access to solid ground – no jumping required)
- Stretcher
- Safety belt with life line
- Ring buoy
- Safety axe
- 1st aid box

Whenever a work accident happens, a first aider is to be consulted to carry out competent first medical care.

If necessary, a doctor is called in or the workers is brought to the hospital for further special medical care.

Emergency preparedness and response

An Emergency and Response Plan is to be implemented by HSE Manager in cooperation with the top management of the SRF. It has to provide guidance for different types of emergencies in ship recycling, including fire and explosion, storm, monsoon, pollution incidents (gaseous, liquid and solid), etc.

Any dangerous zone or area for specific activities in the SRF is marked in the facility plan. Potential risks and preventive measures as well as related equipment are considered in the plan and reflected in the layout plan.

Potentially dangerous situations are to be described in more detail especially for:

- Evacuation
- Fire & Explosion
- Pollution incident: solid, chemical or oil spill
- Monsoon and storms

Annex B.29

Crisis Management Team & Emergency numbers

Crisis Management should be led by top management, i.e. the General Manager.

Team members should be:

- Assistant general manager
- Production manager, if applicable subcontractor
- HSE officer

Placards with evacuation routes and assembly points are to be visible for each worker and visitor at dedicated points in the SRF. Additionally the following emergency numbers should displayed at the assembly points and / or a central location):

Evacuation

An alarm is to be specified for signalling that any person in the SRF has to go straight to the assembly point. In case a fire or gas / oil leakage is detected, workers have to stop work and close the valves from the cutting torch immediately. The General Manager is to be informed or a supervisor for starting the evacuation.

Annex B.30

Relevant Requirement

B.30 Fire and explosion prevention, detection and response

The SRF shall have systems in place for preventing fires and explosions and for fire-fighting, by controlling any outbreak of fire quickly and efficiently and by quickly and safely evacuating all personnel at the SRF.

Additional Explanation

During ship recycling, smoking in explosive areas (as well as storage of gases or inflammable solids) and the vicinity either on the SRF or on-board the ship is forbidden for preventing fire and explosion. All flammable liquids and materials are to be removed from the ship before hot works are conducted. If storage of flammable liquids onshore is required, these areas are controlled against leakage and fire impacts. Also a wall around these areas is required to protected tanks and pressure vessels etc. against accidents, spills and excessive heat. The container shall have a size bigger than the biggest vessel or container stored inside.

During cutting onshore, only residues of seals, insulation or paint might burn. Sand and/or water can be used to extinguish fires. If a gas bottle catches fire foam and water spray is used as extinguishing agent and for cooling the bottles to protect them against overheating and explosion. Generally, extinguishing fires and related handling is the task of the firefighting team and in case of bigger emergencies of the local fire brigade.

Annex C.3

Relevant Requirement

C.3 Management of Hazardous Materials

The SRF shall ensure robust processes, control procedures and abatement methodologies to be used for the removal, labelling, storage, segregation, transport, treatment and disposal of all relevant Hazardous Materials, which shall be developed in accordance with national requirements, as applicable.

Additional Explanation

The SRFs have to be able to handle in a safe and environmentally sound manner different types of wastes and hazardous wastes from ships for ensuring compliance with RSRS. For the final treatment and / or disposal of such wastes registered contractors are to be used (or valid permission of the SRF itself be available). The SRF has to ensure that contractors hold a valid permit for the provided services (permit management should be described properly in SRFP). In case a SRF can't handle all of the below listed materials, alternatives have to be found, This can e.g. be made via agreements with the ship-owner to dispose of certain materials prior to delivery. As this option is found not to be favourable, the selected RSRS-compliant SRFs should preferably provide a "one stop shop" capable of handling all of the below listed wastes (red entries = additional requirements of EU-SRR).

HazMats of structure & equipment (Table A & B)

IHM Part I Table A	Asbestos
	Polychlorinated biphenyls (PCBs)
	Ozone-depleting substances (ODSs)
	Anti-fouling compounds and systems
	PFOS (EU)

HazMats of structure & equipment (Table A & B)

IHM Part I Table B	Cadmium and cadmium compounds	Polybrominated diphenyl ethers (PBDEs)
	Hexavalent chromium and hexavalent chromium compounds	Polychlorinated naphthalenes (PCNs)
	Lead and lead compounds	Radioactive substances
	Mercury and mercury compounds	Certain short-chain chlorinated paraffins
	Polybrominated biphenyls (PBBs)	HBCDD (EU)

Annex C.3

Operationally generated wastes

IHM Part II		
	Waste oil (sludge)	Medical/infectious waste
	Bilge and/or waste water generated by the after-treatment systems fitted on machineries	Incinerator ash
	Oily liquid cargo residues	Garbage
	Ballast water	Fuel tank residues
	Raw sewage	Oily solid cargo tank residues
	Treated sewage	Oily or chemical contaminated rags
	Non-oily liquid cargo residues	Dry tank residues
	Dry cargo residues	Cargo residues

Stores

IHM Part III		
	Kerosene	Butane
	White spirit	Oxygen
	Lubricating oil	Carbon dioxide
	Hydraulic oil	Perfluorocarbons (PFCs)
	Anti-seize compounds	Methane
	Fuel additive	Hydrofluorocarbons (HFCs)
	Engine coolant additives	Nitrous oxide (N ₂ O)
	Antifreeze fluids	Sulfur hexafluoride (SF ₆)
	Boiler and feed water treatment and test reagents	Bunkers, e.g. fuel oil
	Deionizer-regenerating chemicals	Grease
	Evaporator dosing and descaling acids	Fuel gas
	Paint stabilizers/rust stabilizers	Batteries (including lead-acid batteries)
	Solvents/thinners	Pesticides/insecticide sprays
	Paints	Extinguishers
	Chemical refrigerants	Chemical cleaner (including electrical equipment cleaner, carbon remover)
	Battery electrolyte	Detergent/bleacher (potentially a liquid)
	Alcohol/methylated spirits	Miscellaneous medicines
	Acetylene	Fire-fighting clothing and personal protective equipment
	Propane	Spare parts containing Hazardous Materials

Annex C.3

General wastes from ships (operational)

Liquids

Bilgewater sludge
Waste waters (gray- and black water)
Pulped residues (mainly food waste sludge)
Dry cleaning solvents
Acids
Alkalis
Oxidizers
Cooking oil (especially for cruise vessels)

Solids

Plastics (incl. ropes)
Wood
Paint chips
Cardboard and paper
Fluorescent bulbs
Pressurized vessels and spray cans
Cartridges and toner
Tins
Glass

Cargo related residues

Dunnage (wood)

Annex C.3

Storage rooms for solid wastes and solid hazardous wastes

The listed wastes and hazardous wastes provide in the previous chapter can be stored according to their characteristics as well as further treatment and disposal options. Therefore not for each of the different types of materials, in the above tables, separate rooms for storage are required.

The sizes of the rooms should be according to the expected volumes of wastes in relation to the frequency of delivery to subcontractors. The minimum list of categorized storage rooms as applicable in India is provided below:

No.	Solid Hazardous Wastes	Liquid Hazardous Wastes	Non-Hazardous Waste	Gaseous Wastes
1	Asbestos & mineral wool	Fuel oil	Rubber & Plastic waste	Gases without further use are stored in original gas bottles – if at hand – in a safe and protected area without direct sunlight.
2	Paint chips, TBT, solid PCBs	Oily water/slop/bilge	Insulating material (non-asbestos)	
3	Ozone-Depleting Substances (ODS)	Other oils and oily contaminated wastes	Thermocol waste	
4	Radioactive substances	Bilge water incl. sludge's	Municipal Wastes	A sub-contractor is ordered for recovery of gases from ships' systems and disposal at Customs
5	Heavy metals, Polychloronapthalenes (Cl>=3), Brominated flame retardants (HBCDD), PFOS, Polybromated Biphenyl (PBB's), Polybrominated Diphenyl Ethers (PBDE's) and Shortchain Chlorinated Paraffins	Other liquid hazardous materials incl. liquid PCBs, medicine, Heavy metals, HBCDD, chemicals. paints	Electronics, electrical equipment and batteries ¹	
6	Other hazardous materials incl. medicine: to be stored separately			

Design of liquids / chemicals storage

Chemicals and chemical wastes are to be stored in separate storage rooms with following characteristics:

- 3 different shelves for separate storage of acids, alkalis and oxidizers
 - * All shelves are to be labelled (examples as shown below)
 - * Areas under the shelves are separated and act as drip pans to prevent mixing of leakages and chemical reactions
 - * Fluids in the drip pans are removed and sent to disposal according to the waste management procedure
- Are ventilated to prevent toxic atmospheres
- Are well illuminated
- Have a sealed floor (e.g. concrete) for preventing outflow from room

¹ Usually classified and traded as recyclables. In case they occur as wastes they are stored separately and sent to sub-contracted recyclers which take care of proper disposal her hazardous materials incl. medicine: to be stored separately.

Annex C.18

Relevant Requirement

C.18 Spill prevention, control and countermeasures

The SRF shall ensure adequate containment and spill clean-up equipment and procedures.

The SRF shall identify the designated in-house and subcontracted personnel who will be responsible for managing the programme and for responding to spills or similar emergencies, as well as the local authorities (such as the fire department) that may have jurisdiction at the SRF.

Additional Explanation

Any possible incident is avoided. In case of a spill incident the contamination is minimized as much as possible and cleaned-up as early as possible. Therefore, oil and liquid chemical spills are to be integrated into the general emergency preparedness procedure.

The following general rules for handling of leakages are to be applied:

- Spills are not touched
- Closing of nearest and relevant valves or containers
- Use of binding agent for catching of liquid contaminants
- All workers leave the affected area towards assembly point immediately
- In case of bigger incidents or when own capabilities don't lead to a quick relaxation of the situation, the local fire brigade is to be called
- A group of workers is trained for handling of "small" emergency cases e.g. manageable fires and spills; before the fire brigade arrives at SRF. This group should be coordinated and be under supervision of the HSE department.

Prior to arrival / arrival preparations:

- An oil absorbent boom is kept in the oil spill kit close to the shoreline before a ship is landed
- On-board the ship a rope is placed on both sides of the superstructure at the level of the main deck

In case of a spill the oil booms can be pulled on both sides around the vessel, including the areas with no open decks, and connected at the aft of the vessel

During landing and recycling

Within 2 to 4 hours oil or liquid chemical spills will be washed onshore due to continuing current of tide. Therefore below should be in place:

Onshore

- An Emergency Spill Kit is kept within reach at any time at the SRF
- it contains identical materials for cleaning up contaminated area like the spill kit used on-board

Annex C.18

On-board

An 1st Aid and an oil spill kit is stored on the lowest open part of aft deck directly after landing throughout the whole recycling process.

- On-board Oil spill kit contains:
 - * 4 absorbent booms
 - * 8 weights above 10 Kg with a hole in the middle (60mm),
 - * 8 ropes (heights of storage place above sea bed + 20m)

In case of an oil spill:

- Pull oil absorbent boom from onshore along both sides of ship from main deck and keep the boom in a distance to ship (e.g. floating arm)
- Use ropes attached to sides of superstructure for getting around superstructure
- Continue pulling till aft of ship
- Connect both oil absorbent booms at the aft of ship
- Start cleaning up as early and much as possible
- Heavy oil-pieces in intertidal zone are collected during low tide and stored for disposal

Equipment needed:

- 2 oil absorbent booms (length per oil absorbent boom = length of ship x width + 20meters)
- detergent (bio-active for destruction of oil or chemical spill)
- shovels
- plastic drums for collection in sufficient volumes / numbers

The recovered oily water is to be stored onshore in a waste oil / water tank and properly disposed of.

Oil spill clean-up from onshore (improvement option)

In addition to the before described oil spill kits and preventive actions, the oil absorbent booms of the oil spill kits can be used in addition to a different type of oil booms. The below presented oil booms can be used for clean-up operations and / or applied for prevention of spreading of potential spills during the recycling process. These can only be used when not conflicting with falling blocks and therefore either require frequent removal and repositioning or can be used more stationary when being combined with airbags.

Areas of spilled oil or any other chemical liquids are cleaned up immediately. Items used for cleaning which directly come into contact with medium are to be correctly dispose of.

In case of direct contact with aggressive chemicals it is of utmost importance to provide first aid and to consult a doctor for competent care.

Monsoon and Storms

Weather forecasts are monitored and taken into account for taking of preventive measures against adverse effects which could be caused by natural phenomenon. The actions to be taken are different for onshore and on-board situations.

Annex C.18

Onshore

- The SRF is cleaned prior to storms or rainfalls
- All parts which may blow away by storms are secured
- The drainage system is cleaned from oil and sediments, also the grease trap
- Water is channelled from the road around the SRF / working areas, if required temporary water barriers in form of sandbags are put into place
- Winches are protected against flooding with sandbags and tarpaulins
- The oil spill kit is kept on standby
- Waste water stored in storage tank is disposed of for having available maximum tank capacity
- Oily areas and oily equipment is covered
- If required potential water coming from the road is channelled around / prevented from entering the SRF

For cases of heavy rains the HSE Manager is responsible that no uncontrolled outflow or overflow of the tanks can happen. Therefore he or an instructed person has to survey the tank levels within a safe period of time for ensuring that tanks levels are maintained in a safe range. In case a discharge via 3 way valve is not permissible, due to contamination or other circumstances, from the relevant supplier tank trucks are to be ordered and tanks pumped out to them until a safe operation is guaranteed and no overflow or uncontrolled situation likely.

Offshore

- All doors or openings are closed
- Oily areas are cleaned up and covered if possible
- If openings in the hull are nearly on sea water level, they are closed to avoid incoming sea water
- Whenever possible, ship is pulled nearer to the shore line to avoid sea water entering into the ship front
- The ship is to be secured against drifting
- The ship must be positioned properly and safely
 - * If required the ship is additionally secured by ballasting and wire ropes or chain.
 - * The supervisor on site has to ensure that the wire ropes and chains used are in good conditions and capable, he cooperates with the production manager.

Annex C.20

Relevant Requirement

C.20 Debris prevention and control

The SRF shall ensure a programme that defines measures to minimize the potential for debris deposition into the environment, including the maintenance of areas from which debris might be transported into the environment by wind, storm drains, tides or run-off. Control measures shall be implemented to reduce the likelihood of debris deposition.

Additional Explanation

Attention is paid not to lose materials like mineral wool, insulation, plastic foils and other small parts which might be distributed by wind into the environment.

On-board

- Removed and loose materials from the ship are securely packed in bags immediately
- Careful handling of bags and containers as well as materials reduces risk of spills

Onshore

- Loose materials are collected and packed in bags immediately
- They are safely transported to the storage area for treatment, disposal or selling

Control

- Housekeepers collect the wastes and debris throughout the day
- They are supervised by HSE Manager or others on his behalf, e.g. supervisors