ANNEX 4

RESOLUTION MEPC.210(63)

Adopted on 2 March 2012

2012 GUIDELINES FOR SAFE AND ENVIRONMENTALLY SOUND SHIP RECYCLING

THE MARINE ENVIRONMENT PROTECTION COMMITTEE,

RECALLING Article 38(a) of the Convention on the International Maritime Organization concerning the functions of the Marine Environment Protection Committee conferred upon it by the international conventions for the prevention and control of marine pollution,

RECALLING ALSO that the International Conference on the Safe and Environmentally Sound Recycling of Ships held in May 2009 adopted the Hong Kong International Convention for the Safe and Environmentally Sound Recycling of Ships, 2009 (the Hong Kong Convention) together with six Conference resolutions,

NOTING that regulations 17.1 and 19 of the annex to the Hong Kong Convention require that Ship Recycling Facilities shall establish management systems, procedures and techniques which do not pose health risks to the workers or to the population in the vicinity of the Ship Recycling Facility and which will prevent, reduce, minimize and to the extent practicable eliminate adverse effects on the environment caused by Ship Recycling, taking into account guidelines developed by the Organization,

NOTING ALSO that regulation 18 of the annex to the Hong Kong Convention requires that Ship Recycling Facilities shall prepare a Ship Recycling Facility Plan, addressing worker safety and training; protection of human health and the environment; roles and responsibilities of personnel; emergency prepardness and response; and monitoring, reporting and record-keeping systems, taking into account the guidelines developed by the Organization,

NOTING FURTHER that regulations 20.2 and 22 of the annex to the Hong Kong Convention require that Ship Recycling Facilities shall ensure that all Hazardous Materials are identified, labelled, packaged and removed to the maximum extent possible prior to cutting, and shall also ensure that all workers at the Ship Recycling Facility have been provided with appropriate training and familiarization prior to performing any Ship Recycling operation, taking into account the guidelines developed by the Organization,

BEARING IN MIND that the International Conference on the Safe and Environmentally Sound Recycling of Ships, in its resolution 4, invited the Organization to develop Guidelines for global, uniform and effective implementation and enforcement of the relevant requirements of the Convention as a matter of urgency,

HAVING CONSIDERED, at its sixty-third session, the draft 2012 Guidelines for safe and environmentally sound ship recycling developed by the Working Group on Ship Recycling,

1. ADOPTS the 2012 Guidelines for safe and environmentally sound ship recycling, as set out in the annex to this resolution;

2. INVITES Governments to bring the Guidelines to the attention of ship recycling facilities and to encourage their application as soon as possible; and to apply them when the Hong Kong Convention becomes applicable to them; and

3. REQUESTS the Committee to keep the Guidelines under review.

ANNEX

2012 GUIDELINES FOR SAFE AND ENVIRONMENTALLY SOUND SHIP RECYCLING

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1 INTRODUCTION

1.1 Objectives of the guidelines

These guidelines provide stakeholders, particularly Ship Recycling Facilities, with recommendations for the safe and environmentally sound recycling of ships and implementation of the Hong Kong International Convention for the Safe and Environmentally Sound Recycling of Ships, 2009 (hereafter "the Convention").

It should be noted that article 6 and regulations 9 and 17 to 25 of the annex to the Convention provide requirements for Ship Recycling Facilities and require these guidelines to be taken into account.

These guidelines should be used primarily by Ship Recycling Facilities, but other stakeholders such as the Competent Authority(ies) and the organizations recognized by it may also find them useful in implementing the Convention.

1.2 Approach of the guidelines

Article 6 of the Convention requires the authorization of Ship Recycling Facilities that recycle ships to which the Convention applies or ships treated similarly pursuant to article 3.4 of the Convention. Regulation 18 specifies that such authorized Ship Recycling Facilities shall develop a comprehensive Ship Recycling Facility Plan (SRFP) that, among others, should cover worker safety and training, protection of human health and the environment, roles and responsibilities of personnel, emergency preparedness and response and systems for monitoring, reporting and record-keeping.

These guidelines describe the recommended content of the SRFP, and information is provided where appropriate to illustrate the performance standards anticipated by specific regulations of the Convention.

2 DEFINITIONS

The terms used in these guidelines have the same meaning as those defined in the Convention. The following additional definitions apply to these guidelines only.

2.1 "Adjacent space" means those spaces bordering a space in all directions, including all points of contact, corners, diagonals, decks, tank tops and bulkheads.

2.2 "Dangerous atmosphere" means an atmosphere that may expose workers to the risk of death, incapacitation, impairment of ability to self-rescue (i.e. to escape unaided from a space), injury or acute illness.

2.3 "Enclosed space" means a space that has any of the following characteristics:

.1 limited openings for entry and exit;

.2 inadequate ventilation; and/or

.3 is not designed for continuous worker occupancy.

Enclosed spaces include, but are not limited to, cargo spaces, double bottoms, fuel tanks, ballast tanks, cargo pump-rooms, cargo compressor rooms, cofferdams, void spaces, duct keels, inter-barrier spaces, boilers, engine crankcases, engine scavenge air receivers, sewage tanks and adjacent connected spaces.

2.4 "Entry" means the action by which a person passes through an opening into a space. Entry includes ensuing work activities in that space and is considered to have occurred as soon as any part of the entrant's body breaks the plane of an opening into the space.

2.5 "Hot work" means any activity requiring the use of electric arc or gas welding equipment, cutting burner equipment or other forms of flame, as well as heating or spark-generating tools, regardless of where it is carried out on board a ship.

2.6 "Space" means a permanent or temporary three-dimensional structure or compartment on a ship such as, but not limited to, cargo tanks or holds; pump or engine rooms; storage lockers; tanks containing flammable or combustible liquids, gases, or solids; other rooms; crawl spaces; tunnels (i.e. shaft alleys); or access ways. The atmosphere within a space is the entire volume within its bounds.

3 SHIP RECYCLING FACILITY PLAN (SRFP)

The Ship Recycling Facility Plan (SRFP) shall be adopted by the board or appropriate governing body of the Recycling Company. The SRFP is the main document that the Competent Authority(ies), or organization recognized by it, will rely on in authorizing a Ship Recycling Facility. Site inspections are to be utilized to verify that Facility operations conform to the description in the SRFP. It is therefore critical that the SRFP should fully describe the operations and procedures that are in place at the Ship Recycling Facility to ensure compliance with the Convention.

The SRFP should demonstrate knowledge and understanding of all applicable statutory and regulatory requirements and a strong commitment to worker health and safety and protection of the environment. The SRFP should also describe the operational processes and procedures involved in ship recycling at the Ship Recycling Facility, demonstrating how the requirements of the Convention will be met. The recommended format for the SRFP is included in appendix 1.

3.1 Facility management

The SRFP should provide information regarding the organizational structure and management policies of the Recycling Company, an overview of the Ship Recycling Facility, and methodologies related to ship recycling. The SRFP should provide sufficient detail to demonstrate a thorough understanding of production processes and project management associated with ship recycling, and should demonstrate that the Ship Recycling Facility uses valid and practical solutions to the technical problems inherent in ship recycling.

The SRFP should anticipate alterations to recycling operational processes as a result of the discovery of previously unknown factors or items during ship recycling. Procedures should be established for identifying and dealing with previously unknown features. In addition, the decision-making process should lead to an approach that will ensure protection of the safety and health of workers and the environment.

3.1.1 Company information

The SRFP should provide detailed information on:

.1 the operator of the Ship Recycling Facility, including the organizational structure and a detailed summary of the operator's experience relevant to ship recycling;

.2 the name of the land or Facility owner, if different to the operator;

.3 the roles, responsibilities and qualifications of management personnel;

.4 the roles and responsibilities of the key personnel at the Ship Recycling Facility (key personnel should have the appropriate skills and experience for the intended job functions. The Ship Recycling Facility should have a dedicated environmental, safety and health manager and a person trained in first aid or medical care);

.5 the Ship Recycling Facility's environmental, occupational safety and health management systems, including application of any formally recognized international standards for an environmental management system (e.g. ISO14001) and occupational safety and health management systems (e.g. OHSAS18001), and any certification awarded, as applicable;

.6 the policy statement on the Facility's commitment to protection of the environment and occupational safety and health, including the objectives set by the Facility for the minimization and ultimate elimination of adverse effects on human health and the environment caused by ship recycling;

.7 the methodologies used for ensuring compliance with the applicable statutory and regulatory requirements; and

.8 the system by which the objectives and goals set out in the policy of the Recycling Company and the continuous improvement of the performance of the Facility are to be achieved.

The Ship Recycling Facility's environmental and occupational safety and health management programme, policies and objectives should be communicated to and understood by all personnel working at the Facility.

3.1.2 Training programme

Regulation 22 of the Convention specifies that the Ship Recycling Facility shall ensure that training programmes are provided. The SRFP should 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. The training programmes should cover all workers and members of the Ship Recycling Facility, including contractor personnel and employees (regulation 22.3.1), and should identify the type and frequency of training. The training programme shall be reviewed periodically and modified as necessary (regulation 22.3.5).

The training programme should enable workers to safely undertake all operations that they are tasked to do and ensure that all workers at the Ship Recycling Facility have been provided with the appropriate training prior to performing any ship recycling operation.

The programme should include appropriate training for tasks and operations performed by the employees including, but not limited to, the following:

.1 awareness and communication of information about Hazardous Materials;

.2 job hazard awareness, including handling and management of Hazardous Materials;

.3 personal protective equipment;

.4 fire protection and prevention;

.5 emergency response and evacuation;

.6 safety and health training;

.7 environmental awareness; and

.8 first-aid awareness.

3.1.3 Worker management

The SRFP should include specific information on worker responsibilities, including qualifications, training and monitoring responsibilities.

3.1.4 Records management

The SRFP should outline the policies and procedures for retaining vital records associated with Facility operations and, specifically, the recycling of each ship. The retention of records should include, but not be limited to, laboratory analytical results, manifests, shipping documents, truck receipts, waste shipment records, records of training and exercises/drills, worker accidents, injuries and medical or health records such as occupational health examinations carried out and occupational diseases contracted, and a description of any national requirements for records management and retention. If national requirements do not specify a time period, it is recommended that records should be kept for five years.

3.2 Facility operation

The SRFP should 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 Ship Recycling Facility plans to prevent adverse effects to human health and the environment (regulation 19).

3.2.1 Facility information

The SRFP should provide a clear and concise description of the physical location of the Facility, including acreage and Facility access routes. A detailed Ship Recycling Facility drawing or map should be included, with information regarding the area where recycling will occur. The SRFP should include a clear and concise description of the pertinent details of the Ship Recycling Facility, such as Facility layout, water depth, accessibility, maintenance and dredging.

The SRFP should include a clear and concise description of the total estimated ship recycling capacity, the production throughput/capacity of recyclables including steel and engineering features for material segregation and processing. Temporary and permanent buildings such as offices, workers' complex, drinking water supply, sanitation, medical and first-aid facilities, gas storage and Hazardous Materials storage and processing facilities should be identified, as should the floor construction, other structures, roadways and emergency access routes.

The SRFP should include a clear and concise description of the pertinent details of the principle operational equipment in use at the Ship Recycling Facility. It is recommended that this should include the quantity, capacity and type of such equipment and other pertinent information such as test certificates, safe working loads and qualifications of operators, in relation to worker safety and protection of the environment.

An example of Facility information is given in appendix 2, which also covers the guidance contained in section 3.2.2 ("Permits, licences and certification").

3.2.2 Permits, licences and certification

The SRFP should document the procedures in place to ensure that the Ship Recycling Facility is operated and maintained in a manner that complies with all applicable laws and regulations.

The SRFP should include information on site-specific permits, licences, and/or certificates that are in effect or obtained prior to the start of ship recycling, including any lease or authorization from a landowner, port or other entity granting authorization to use the Facility for ship recycling purposes.

The SRFP should include procedures to ensure the appropriate level of certification and/or verification in order that all subcontractors (including those involved in handling, transport, treatment, storage and disposal) hold valid permits, registrations and/or certificates, as applicable.

The use of subcontractors for any part of the process of working with or managing Hazardous Materials in the Ship Recycling Facility does not relieve the Ship Recycling Facility of its responsibilities. In all matters covered by these guidelines, the Ship Recycling Facility should ensure and maintain records to document safe and environmentally sound management by subcontractors.

3.2.3 Acceptability of ships

The Convention contains requirements for the acceptance of ships for recycling. The SRFP should describe the processes and procedures to be implemented before the ship arrives at the Ship Recycling Facility for recycling.

When preparing to receive a ship for recycling, the first step shall be to notify the Competent Authority(ies) of the intent (see regulation 24.2). When the ship destined to be recycled has acquired the International Ready for Recycling Certificate, the Ship Recycling Facility shall report to its Competent Authority(ies) the planned start date of the ship recycling, using the reporting format in appendix 6 of the Convention. The procedures to be followed by stakeholders from the recycling preparation phase to the completion of recycling, as required by the Convention, are illustrated in appendix 3 of these guidelines.

3.2.4 Ship Recycling Plan (SRP) development

Under regulation 9 of the Convention, a ship-specific Ship Recycling Plan (SRP) shall be developed by the Ship Recycling Facility before any recycling of a ship can take place. The operational processes that are indicated in the SRFP can be used to prepare the SRP. The Convention requires that the SRP should be approved, in accordance with regulation 9, prior to issuance of an International Ready for Recycling Certificate. The SRFP should describe the process for developing a SRP, taking into account the *Guidelines for the Development of the Ship Recycling Plan (SRP)*.

3.2.5 Vessel arrival management

The SRFP should describe the procedures to be implemented to secure vessels upon arrival at the Ship Recycling Facility, including provisions for mooring, heavy and/or severe weather contingencies, afloat monitoring, stability during recycling and flooding and/or sinking prevention methods. Provisions may be different depending on the ship recycling method.

3.2.6 Ship recycling methodology

The SRFP should provide a comprehensive description of the Ship Recycling Facility's ship recycling methodology, covering the entire process of recycling a vessel including management of Hazardous Materials and wastes and a description of the methodology and procedures for identifying and segregating materials. The SRFP should also include a detailed description of how recycled materials, reusable items and wastes are handled and/or disposed of in a safe and environmentally sound manner.

The SRFP should include procedures for conducting assessments of the hazards associated with the safe and environmentally sound recycling of ships and should identify the subsequent process for minimizing and eliminating any such hazards.

Where materials or wastes are removed from the Ship Recycling Facility for further processing and/or disposal, the SRFP should provide details of the procedures that will be used to ensure that they are transferred only to a facility that is authorized to deal with their treatment and/or disposal in an environmentally sound manner.

3.2.7 Reporting upon completion

Regulation 25 of the Convention contains requirements for reporting upon completion. The SRFP should describe the procedures in place for such reporting, including how the Ship Recycling Facility will document and report any incidents and accidents.

3.3 Worker safety and health compliance approach

3.3.1 Worker health and safety

In this section of the SRFP, the Ship Recycling Facility should provide a comprehensive description of the Facility's plans and procedures for protecting worker health and safety and should reflect applicable requirements of the Convention (particularly regulations 19 and 21 to 23) and national legislation. The Ship Recycling Facility should also take into account, as appropriate, guidelines developed by international organizations. A reference list of these guidelines is provided in appendix 4. The SRFP should identify and demonstrate the Ship Recycling Facility's knowledge and understanding of applicable worker safety and occupational health processes, procedures, laws, regulations and guidance. Further, the SRFP should demonstrate that the safety and health programme supports the activities necessary for environmental compliance and for recycling and disposal at the Ship Recycling Facility.

3.3.2 Key safety and health personnel

The SRFP should identify one or more key personnel who possess the level of training and experience necessary to effectively ensure that safe conditions are maintained during operations at the Ship Recycling Facility, including one or more Competent persons for the performance of specific work. Depending upon the size of the Ship Recycling Facility and the number of workers, the SRFP could include a hierarchy of safety and health management staff, including an overall manager, supervisory staff and general workers.

3.3.3 Job hazard assessment

The SRFP should include the procedures to be implemented to conduct a job-hazard assessment to determine the proper approach to maximizing worker safety. Responsibility for job hazard assessments should be assigned to a Competent person for the specific hazards of each job. It is recommended that the assessments should be conducted by a team of personnel including the Competent person, a representative of management and workers with the appropriate level of expertise.

3.3.4 Prevention of adverse effects to human health

Regulation 19 of the Convention specifies that the Ship Recycling Facility shall establish and utilize procedures to prevent explosions 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. Since these are among the more critical aspects for the safe operation of Ship Recycling Facilities, it is important that the SRFP clearly demonstrates that it has procedures in place to prevent workplace accidents and injuries. The guidelines below outline the key considerations that should be included in the SRFP.

3.3.4.1 Safe-for-entry procedures

Throughout the entire recycling process, the Ship Recycling Facility should ensure that, prior to entry and during work, enclosed spaces and other areas where the atmosphere is dangerous are monitored to ensure that they remain Safe-for-entry and safe for continued activity. The Ship Recycling Facility should ensure that shipboard spaces are not entered until a Safe-for-entry certificate has been issued by a Competent person. A Competent person should visually inspect and test each space on the ship to determine the areas which are safe for entry before issuing a certificate and before recycling activities are commenced.

Safe-for-entry certification, inspection and testing should be conducted in all spaces that have the potential to pose harm to human health as a result of the space's oxygen content, flammability or atmospheric toxicity, with particular attention paid to enclosed spaces and to spaces and adjacent spaces where hot work has been or will be performed during the course of the daily recycling work.

Designation as "Safe-for-entry" is not sufficient for hot work, as additional criteria should be met to address safety issues related to hot work.

3.3.4.1.1 Safe-for-entry criteria

For entry purposes, steady readings of all the following should be obtained:

.1 the oxygen content of the atmosphere is 21 per cent by volume, measured using an oxygen content meter (Note: National requirements may determine a safe atmosphere range);

.2 where the preliminary assessment has determined that there is potential for flammable gases or vapours, the concentration of those gases or vapours is not higher than 1 per cent of their lower flammable limit (LFL), measured using a suitably sensitive combustible gas indicator; and

.3 the concentration of any toxic vapours and gases is not higher than 50 per cent of their occupational exposure limit (OEL)[1].

If these conditions cannot be met, the space should be ventilated further and retested after a suitable interval.

3.3.4.1.2 Competent person for Safe-for-entry determination

Regulation 1 of the Convention defines "Competent person". The Competent Authority should define the appropriate criteria for designation of a Competent person. However, the Competent person(s) for Safe-for-entry and/or Safe-for-hot-work determination should be able to determine oxygen content, concentration of flammable vapours and gases and the presence of toxic, corrosive, irritant or fumigated atmospheres and residues. The Competent person should possess sufficient knowledge and practical experience to make an informed assessment based on the structure, location and designation of spaces where work is done. The Competent person should possess the ability to inspect, test and evaluate spaces to determine the need for further testing. The Competent person should also monitor the maintenance of appropriate conditions in spaces.

3.3.4.1.3 Safe-for-entry inspection and testing procedures

Designation as "Safe-for-entry" is not sufficient for hot work, as additional criteria must be met to address safety issues related to hot work. Testing should be carried out by a Competent person using appropriate and properly certified and calibrated equipment, including, but not limited to, an oxygen content meter, combustible gas indicator, toxicity meter and gas or vapour detection equipment.

3.3.4.1.4 Oxygen

The Ship Recycling Facility should ensure that spaces are tested by a Competent person to determine the atmosphere's oxygen content prior to initial entry into the space by workers, and also that the space is periodically monitored and recorded for as long as it is occupied. Spaces that warrant particular consideration include the following:

- spaces that have been sealed;

[1] It should be noted that the term occupational exposure limit (OEL) includes the permissible exposure limit (PEL), maximum allowable concentration (MAC) and threshold limit value (TLV), or any other internationally recognized terms.

- spaces and adjacent spaces that contain or have recently contained combustible or flammable liquids or gases;

- spaces and adjacent spaces that contain or have recently contained liquids, gases or solids that are toxic, corrosive, or irritant;

- spaces and adjacent spaces that have been fumigated; and

- spaces containing materials or residues of materials that create an oxygen-deficient atmosphere.

A worker should only enter a space where the oxygen content, by volume, has the value noted in 3.3.4.1.1. In such a case, the space should be labelled "Safe-for-entry". If an oxygen-deficient or oxygen-enriched atmosphere is found, ventilation should be provided at volumes and flow rates sufficient to ensure that the oxygen content is maintained at the value noted in 3.3.4.1.1. The label may be reattached when the oxygen content returns to the value noted in 3.3.4.1.1, and after it has been tested and inspected by the Competent person.

3.3.4.1.5 Flammable atmospheres

The Ship Recycling Facility should ensure that spaces and adjacent spaces that contain or have contained combustible or flammable liquids or gases are visually inspected and tested by the Competent person prior to entry by workers, and that they are periodically monitored and the results recorded throughout the time that the spaces are occupied.

If the concentration of flammable vapours or gases in the space to be entered is equal to or greater than 1 per cent of the lower flammable limit, then no one should enter the space and the label "Safe-for-entry" should be removed. Ventilation should be provided at volumes and flow rates sufficient to ensure that the concentration of flammable vapours is maintained below 1 per cent of the lower flammable limit. The label may be reattached when the concentration of flammable vapours falls below 1 per cent of the lower flammable limit and after it has been tested and inspected by the Competent person.

3.3.4.1.6 Toxic, corrosive, irritant or fumigated atmospheres and residues

The Ship Recycling Facility should ensure that spaces or adjacent spaces that contain or have contained liquids, gases or solids that are toxic, corrosive or irritant are visually inspected and tested by a Competent person prior to initial entry by workers.

If a space contains an air concentration of a material which exceeds 50 per cent of their OEL, then no one should enter the space and it should not be labelled "Safe-for-entry". Ventilation should be provided at volumes and flow rates sufficient to ensure that air concentrations are maintained below 50 per cent of their OEL. The label may be reattached when the concentration of contaminants is maintained below 50 per cent of their OEL and after it has been tested and inspected by the Competent person.

3.3.4.1.7 Safe-for-entry determination by a Competent person

A Competent person should visually inspect and test each space certified as "Safe-for-entry" as often as necessary to ensure that atmospheric conditions within that space are maintained within the conditions established by the certificate. However, at a minimum, the space should be inspected and tested at least once in an eight-hour shift period. The results of these tests should be recorded on the Safe-for-entry certificate.

When a change occurs that could alter conditions within a tested enclosed space or other dangerous atmosphere, work in the affected space or area should be stopped. Work may not be resumed until the affected space or area is visually inspected and retested by the Competent person and found to comply with the certification. It is recommended that the space should be ventilated and the atmospheric conditions returned to the acceptable limits after a space has been found to exceed limits.

If the Competent person has initially determined that a space is safe for an employee to enter and they subsequently find that the conditions within the tested space fail to meet the requirements, work should be stopped until the conditions in the tested space are corrected to comply with the certification requirements. If it is safe to do so, the Competent person may be asked to investigate the reason for the space's non-compliance and to ensure that the remedial action to be taken will prevent a reoccurrence.

3.3.4.1.8 Safe-for-entry certificate, warning signs and labels

Any determination of a space as "Safe-for-entry" should be accompanied by a certificate which, at a minimum, should clearly indicate the following information:

- name and title of the Competent person performing the test(s) and inspection(s);
- signature of the above person;
- name of vessel and location;
- the areas of the ship that are Safe-for-entry;
- date and time of the inspection;
- location of inspected spaces;
- tests performed;
- type of equipment used in testing;
- test results;
- period of retesting of the spaces;
- results of periodic retesting undertaken;
- conditions when the Competent person should be recalled or conditions that void the certificate;
- safety designation(s) ("Safe-for-entry", "Not Safe-for-entry");
- validity period and expiration date of the certificate, recommended to be a maximum of 24 hours, with periodic retesting intervals not exceeding eight hours;
- type of ventilation; and
- any additional relevant information or instructions.

Safe-for-entry certificates should be posted at every access point between ashore and the ship. A record of inspection of atmospheric tests should be appended to the certificate.

The certificate and/or the spaces themselves should be clearly marked and presented in a manner that can be seen and understood by all workers in the working language of the yard and, if possible, with pictorial representations.

If an entire work area has been tested and labelled with the proper signage (for example, as being "Safe-for-entry") at all points of access to the work area, an individual tank or other space located within the work area need not be labelled separately.

The certificate, updates and any other records should be kept on file for a period of at least three months from the completion date of the specific job for which they were generated.

If a space at any time ceases to meet the Safe-for-entry criteria, the label "Safe-for-entry" should be removed.

3.3.4.1.9 Safe-for-entry operational measures

In addition to ensuring certification as "Safe-for-entry", the following operational measures should also be observed:

- no person may open or enter an enclosed space unless authorized by the Competent person of the Ship Recycling Facility and unless the appropriate safety procedures have been followed;

- a permit for entry has been issued for those intended to enter the space by the same individual(s) who is/are responsible for maintaining the certificate on behalf of the Ship Recycling Facility, confirming that all certification processes and operational measures for safe entry have been completed and are in effect;

- the space is properly illuminated;

- there is appropriate access and egress to the space and the working area in the enclosed space is suitable for the work that is being considered, specifically for heavy, large or complex lifting operations;

- a suitable system of communication between all parties for use during entry is agreed upon, tested and used;

- the space is adequately isolated from gases, liquids or other identified hazardous substances that could inadvertently be released into the space in which work is being undertaken;

- a fully-trained supervisor, who may be in charge of one or more work teams, has oversight of the area and frequently monitors the conditions to which the workers are exposed;

- the style of ventilation equipment is such that no ignition sources are introduced into a hazardous space;

- the ventilation provided for the space is adequate for the work to be undertaken and for any diurnal variation in environmental conditions that may be experienced in hot or humid regions;

- the ventilation system is designed to prevent the persistence of gas pockets within tanks/spaces – owing either to the complex structure of the tank/space or to the fact that the gas pockets are heavier than air vapours in the tank – which may be achieved by suction/evacuation style ventilation rather than blower ventilation;

- in the event of ventilation system failure, some means of alert is provided so that any persons in the space can leave immediately;

- appropriate rescue and fire control plans are in place;

- appropriate personal protective equipment (PPE), protective clothing and safety equipment (including harnesses and lifelines) are provided to the workers, and used during entry to and work in the designated spaces; and

- adequate and functioning rescue and resuscitation equipment has been provided and is positioned ready for use at the entrance of the space.

If the fire alarm is activated, the space should be evacuated until the all-clear for re-entry is given by the Competent person.

3.3.4.2 Safe-for-hot-work procedures

The Ship Recycling Facility should ensure that no hot work commences on a ship unless the area is deemed "Safe-for-hot-work".

Safe-for-hot-work certification, inspection and testing apply to all of the following:

- enclosed spaces and all other spaces enclosed by bulkheads and decks (including cargo holds, tanks, quarters, and machinery and boiler spaces) that potentially contain dangerous atmospheres;

- within, on, or immediately adjacent to spaces that contain or have contained combustible or flammable liquids or gases;

- within, on, or immediately adjacent to fuel tanks that contain or have last contained fuel;

- on pipelines, heating coils, pump fittings or other accessories connected to spaces that contain or have last contained fuel; and

- bilges, cargo holds, engine room spaces and boiler spaces not containing dangerous atmospheres.

The Ship Recycling Facility should ensure that no hot work commences in any of these spaces until Safe-for-hot-work certification has been issued by a Competent person; these inspections and tests should be entered on the record of inspection and testing and posted in a conspicuous place on board. A Competent person should visually inspect and test each space on the ship to determine the areas which are deemed "Safe-for-hot-work" before a certificate is issued and before recycling activities commence.

3.3.4.2.1 Safe-for-hot-work criteria

A space that is "Safe-for-hot-work" is one that meets all the Safe-for-entry criteria and also the following criteria:

- any residues or materials in the space are not capable of producing an oxygen-enriched or oxygen-deficient environment, and are not capable of generating flammable or explosive vapours;

- all adjacent spaces have been cleaned, rendered inert or sufficiently treated to prevent the risk of explosion, the release of noxious or toxic fumes or gases and the spread of fire; and

- work in adjacent spaces is not affected by the hot work, such as tank entry, lifting operations or deconstruction by hand.

3.3.4.2.2 Competent person for Safe-for-hot-work determination

A Competent person for matters related to Safe-for-hot-work determination should meet the criteria identified in 3.3.4.1 and possess the additional knowledge and skills required to handle hot work activities.

3.3.4.2.3 Safe-for-hot-work inspection, testing and determination

Each space should be certified by a Competent person as "Safe-for-hot-work" as often as necessary to ensure that conditions within that space are maintained as established by the certificate. The frequency with which a space should be monitored to determine whether conditions are being maintained is a function of the following, but should in any event not exceed an eight-hour shift period:

- temperature: any changes in temperature in the space could result in a change in its atmospheric conditions, and hotter days can cause residues to produce more vapours, resulting in a greater risk of flammable or explosive conditions;

- work in the space: activity in the space can change its atmospheric conditions; gas leaks from a hose or torch or manual tank cleaning by scraping or using hand-held high-pressure spray devices can stir up residues, which can result in a greater risk of flammable or explosive conditions;

- period of elapsed time: if a sufficient period of time (not to exceed 24 hours) has elapsed since Safe-for-hot-work certificate was issued, the condition of the space should be retested prior to entry and commencement of work;

- unattended spaces: a tank or space that has been certified as "Safe-for-hot-work" then subsequently left unattended for a sufficient period of time should be retested prior to entry and commencement of work;

- work break: tanks or spaces should be checked for equipment left behind when workers take a break or leave at the end of the shift, and the condition of the tank or space should be retested prior to entry and resumption of work; and

- ballasting or trimming: changing the position of the ballast or moving or trimming the ship in any way can produce a change in the atmosphere of the spaces; the condition of the spaces should be retested prior to entry and resumption of work.

3.3.4.2.4 Safe-for-hot-work certificate, warning signs and labels

Any determination of a space as "Safe-for-hot-work" should be accompanied by a certificate which, at a minimum, should include the information identified in section 3.3.4.1.8 ("Safe-for-entry certificate, warning signs and labels"). Warning signs and labels should be posted in the manner described in section 3.3.4.1.8 for Safe-for-entry determination, clearly indicating that the space is "Safe-for-hot-work".

3.3.4.2.5 Safe-for-hot-work operational measures

In addition to the measures identified in section 3.3.4.1.9 ("Safe-for-entry operational measures"), the following should also be applied in order to achieve certification as "Safe-for-hot-work":

- each area where hot work is to be performed should be carefully prepared and isolated before hot work commences;

- all trash, debris, oil residues or other materials that could generate flammable or explosive vapours should be removed from the space prior to commencing hot work. The space and adjacent spaces should be kept free of any trash, debris, oil residues or other materials that could result in a risk of flammable or explosive conditions;

- drums and similar small containers which have contained flammable substances should, before they are cut, be either filled with water or thoroughly cleaned of such substances;

- deck tanks should be appropriately cleaned, gas freed and certified as Safe-for-entry and tested for hot work as described in the general sections (see sections 3.3.4.1 and 3.3.4.2). A suitable supply of fresh air should be maintained, given that oxygen from the atmosphere may be removed in the combustion process. The tanks should be isolated and tested in accordance with the guidance given in these guidelines. Particular attention should be paid to access and egress and to the unique challenges presented by these spaces regarding tank rescue in an emergency situation;

- fixed cargo or fuel tanks should be cleaned and ventilated before any work commences and after having been passed as "Safe-for-entry" and "Safe-for-hot-work". Cleaning should be sufficient to remove any hazardous liquids, light solids and clinkage to allow the tank to be gas freed. Complex structures may require additional preparation before being certified as "Safe-for-hot-work". The need for localized manual cleaning should be considered. Ventilation should allow an adequate flow of air to all parts of the space to prevent a build-up of gases either from the hot work or from the tank coatings;

- ventilation should be provided at volumes and flow rates sufficient to ensure that the concentration of flammable vapours is maintained below 1 per cent of the lower flammable limit;

- general mechanical ventilation should be of sufficient capacity and so arranged as to produce sufficient air changes to maintain safe levels of welding fumes and smoke; and

- the Ship Recycling Facility's fire safety procedures should be followed.

3.3.4.3 Welding, cutting, grinding and heating

The SRFP should include procedures for ventilation, personnel monitoring for heavy-metals exposure, protection of personnel, training, respiratory protection, torch cutting, permits and inspections (including hot-work certification). The SRFP should include procedures for transporting, moving, securing, storing and using hoses and torches.

3.3.4.4 Drums, containers and pressure vessels

The SRFP should include procedures for handling, transporting and storing pressure vessels containing flammable gases, such as acetylene (C_2H_2), propane gas (C_3H_8) or oxygen (O_2) for welding, heating and cutting works, in order to avoid any human injuries, caused by external forces, shock or heat to such vessels.

Procedures for removing pressure vessels containing carbon dioxide (CO_2), nitrogen (N_2) and other ozone-depleting substances used in fire-fighting and refrigeration systems should also be included.

Procedures for transporting and storing drums and containers containing hazardous liquids, using appropriate PPEs, should also be described in the SRFP.

3.3.4.5 Prevention of falling from heights and accidents caused by falling objects

The SRFP should include procedures for using personal flotation devices, guarding deck openings, deck edges and platforms, utilizing personal fall arrest systems and guard rails and ensuring safe access to ships to prevent slip-and-fall accidents and the dropping and scattering of objects.

3.3.4.6 Gear and equipment for rigging and materials handling

The SRFP should include procedures for testing and inspecting ropes, chains, slings, hooks, chain-falls and hoisting and hauling equipment. It should 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.

3.3.4.7 Housekeeping and illumination

The SRFP should include procedures for work areas, such as aisles, passageways and temporary deck openings.

3.3.4.8 Maintenance and decontamination of tools and equipment

The SRFP should include procedures for inspection and maintenance of equipment, regulatory requirements for third-party inspections and decontamination procedures. These activities and the result of the inspections should be recorded.

The Ship Recycling Facility should ensure that the quantity and the deployment of tools and equipment are suitable for the corresponding recycling activities, especially when a number of ships are to be recycled at the same time.

3.3.4.9 Health and sanitation

The SRFP should include a description of washing facilities, showers, eating and recreation areas, toilet facilities and changing rooms. It is recommended that appropriate changing rooms and sanitary and washing facilities should be provided by the Ship Recycling Facility to control exposure and avoid the spread of Hazardous Materials. Sanitary and washing facilities should be conveniently accessible and situated so that they are not at risk of contamination from the workplace. Separate and appropriate changing rooms and sanitary and washing facilities should be provided for exclusive use by workers handling asbestos. It is also recommended that the Ship Recycling Facility should designate separate and uncontaminated areas for workers to use for eating, drinking and other breaks.

3.3.4.10 Personal protective equipment

The SRFP should include information on procedures and equipment used for the protection of employees from various risks associated with ship recycling.

Respiratory protection and hearing conservation programmes should be developed for all employees who could be exposed to excessive levels. The SRFP should describe how the programmes are in compliance with national regulations. In the absence of domestic law, the Ship Recycling Facility should utilize best industry practices to provide effective respiratory protection and hearing conservation programmes.

3.3.4.11 Worker exposure and medical monitoring

The SRFP should include procedures to be used for monitoring exposure and for medical surveillance.

3.3.5 Emergency preparedness and response plan (EPRP)

Regulations 18.5 and 21 of the Convention specify that Ship Recycling Facilities shall establish and maintain an emergency preparedness and response plan (EPRP). While the EPRP could be incorporated into the SRFP, it is highly recommended that the EPRP should be a separate, self-contained document. By having it as a self-contained document, the information contained within is more readily available and easily accessible, and the Ship Recycling Facility may want to distribute copies to several locations at the site. It is also helpful to have a summary page at the front of the document for quick access, showing 24-hour contact information (including telephone numbers) for the appropriate contact personnel (such as management personnel and emergency response personnel).

The SRFP should identify the locations where the EPRP will be readily available, and should contain a brief summary of the EPRP, so that the appropriate entities (such as those that are authorizing facilities) or other relevant stakeholders can easily confirm that it exists. The EPRP should take into consideration a wide variety of potential scenarios, including, but not limited to, human injuries, environmental accidents, extreme acts of nature and the activities of the surrounding community (such as an emergency at a nearby chemical processing plant).

The EPRP should, at a minimum, include the Facility's response to:

- fire or explosion or ingress of water on the ship being recycled or awaiting recycling, within the perimeter of the Facility, or in an adjacent facility;
- accidents to workers within the Facility;
- spillages of Hazardous Materials; and
- probable acts of nature in the area concerned, such as earthquakes or flooding.

The location, physical and environmental characteristics of the Ship Recycling Facility and the size and nature of activities associated with each ship recycling operation should be taken into consideration during preparation of the EPRP. The EPRP should do the following:

- ensure that the necessary equipment – including fire hydrants, extinguishers, first-aid facilities, clean-up equipment, breathing apparatus, alarms and signals and details of training arrangements that are commensurate with the possible

emergency situations likely to occur at the Ship Recycling Facility – and emergency procedures are in place, and that drills are being held on a regular basis;

- provide for the information and internal communication and coordination necessary to protect all people in the event of an emergency at the Ship Recycling Facility;

- provide information to and ensure communication with the relevant Competent Authority(ies) or organization recognized by it, the surrounding community and the emergency response services;

- provide for first-aid and medical assistance, fire-fighting, evacuation of all people from the Ship Recycling Facility (including emergency escape route and muster station) and pollution prevention measures such as the response to spills of Hazardous Materials (including the safe handling of spilled or emitted materials and the procedure for cleaning contaminated areas);

- provide visible indications of location of first aid stations, fire control stations and evacuation routes;

- further ensure the provision of relevant information and training to all workers at the Ship Recycling Facility, at all levels and according to their competence, including regular exercises in emergency prevention, preparedness and response procedures; and

- include procedures for recording of an emergency incident and investigation and corrective actions following an emergency incident.

3.3.6 Fire and explosion prevention, detection and response

The Ship Recycling Facility should 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 Facility. The SRFP should provide for the following:

- sufficient and secure storage areas for flammable liquids, solids, and gases;
- procedures for the prohibition of smoking through "no smoking" notices;
- precautions to be implemented in spaces where flammable gases, vapours or dust can cause danger (no naked light or flame or hot work should be permitted unless the space has been tested and deemed safe by a Competent person); and
- procedures for the proper storage of combustible materials, greasy or oily wastes and scrap wood or plastics.

The SRFP should also include procedures for regular inspections of spaces where there are risks of fire and explosion. This includes the vicinity of heating appliances, electrical installations, conductors, stores of flammable and combustible materials and areas where operations involving hot welding, cutting, grinding and heating are conducted. The appropriate precautions to reduce the risk of fire and explosions from welding, flame cutting and other hot work should be identified.

The SRFP should include procedures for the provision and selection of fire-extinguishing equipment according to the provisions of applicable international and national laws and regulations, and should record the results of the initial hazard identification and risk assessment of the Ship Recycling Facility operations. Equipment deployment should take account of the following: any restrictions to access or egress to spaces inside the ship; the quantity and characteristics of hazardous, flammable and explosive substances handled in ship recycling operations; site transport and storage facilities; and first-stage fire-fighting demands (such as hand-held or trolley-mounted portable fire extinguishers).

The SRFP should identify the locations of the fire-extinguishing equipment, ensuring that they are readily available, easily visible and in accessible areas. Adequate water supply should be provided in places where the danger of fire exists (in accordance with national laws and regulations).

The SRFP should include procedures for the provision, proper operation, maintenance and regular inspection of all fire-extinguishing equipment by a Competent person. Access to fire-extinguishing equipment, such as hydrants, portable extinguishers, and connections for hoses, should be kept clear at all times.

The SRFP should describe procedures for providing suitable training, instruction and information to all supervisors and workers (including details of the frequency of such training) about the hazards of fires, appropriate precautions to be taken and use of fire-extinguishing equipment, so that adequately trained personnel are readily available during all working periods. Records of training and drills/exercises should be maintained, including such information as type of training/drill, role of person trained, equipment used, duration, location, date and time.

The SRFP should include procedures for the installation of sufficient, suitable and effective warning signals (such as sight and sound signals) in case of fire. There should be an effective evacuation plan so that all personnel are evacuated speedily and safely. The SRFP should include procedures for posting notices in conspicuous places indicating, if applicable, the nearest fire alarm, the telephone number and address of the nearest emergency services and the nearest first-aid station.

3.4 Environmental compliance approach

The SRFP should provide a description of the Ship Recycling Facility's plan and procedures for protecting the environment. The SRFP should demonstrate that the Ship Recycling Facility understands the environmental risks associated with ship recycling, understands and is implementing the environmental requirements imposed by applicable international and national laws and regulations, is capable of managing and disposing of all the materials in the ship in an environmentally sound manner, and is implementing controls to protect the environment, including with respect to handling and disposing of Hazardous Materials. The SRFP should reflect applicable requirements of the Convention (particularly regulations 20 to 22).

The SRFP should describe dedicated infrastructure for the treatment and disposal of Hazardous Materials generated from ship recycling operations pursuant to national laws and regulations. The Ship Recycling Facility should also take account of guidelines developed by international organizations as appropriate. A reference list of such guidelines is provided in appendix 5.

3.4.1 Environmental monitoring

The SRFP should describe the environmental monitoring programme aimed at preventing possible negative impacts to the environment during ship recycling.

Possible negative impacts during ship recycling may be divided into four main categories:

- releases of Hazardous Materials to ground and sediments;
- releases of Hazardous Materials to water;
- emissions of Hazardous Materials to air; and
- noise/vibrations.

The monitoring programme, if included in the SRFP, should be Facility-specific, taking into account the Facility's characteristics, such as the use of dry dock, jetty/piers and/or recycling plots on land-sea interface, and should identify chemical, biological and physical changes in the environment surrounding the Ship Recycling Facility.

The monitoring programme, if included in the SRFP, should utilize well-established standards for the sampling and analysis of relevant environmental parameters.

3.4.2 Management of Hazardous Materials

Prior to recycling, the IHM shall, in addition to the properly maintained and updated Part I, incorporate Part II for operationally generated wastes and Part III for stores (regulation 5.4).

Ships destined to be recycled shall conduct operations in the period prior to entering the Ship Recycling Facility in a manner that minimizes the amount of cargo residues, fuel oil and wastes remaining on board (regulation 8.2).

The following Hazardous Materials, at the very least, should be addressed in the SRFP:

(a) Hazardous materials contained in the ship's structure and equipment (IHM, Part I):

Asbestos
Polychlorinated biphenyls (PCBs)
Ozone-depleting substances (ODSs)
Anti-fouling compounds and systems
Cadmium and cadmium compounds
Hexavalent chromium and hexavalent chromium compounds
Lead and lead compounds
Mercury and mercury compounds
Polybrominated biphenyls (PBBs)
Polybrominated diphenyl ethers (PBDEs)
Polychlorinated naphthalenes (PCNs)
Radioactive substances
Certain short-chain chlorinated paraffins

(b) Operationally generated wastes (IHM, Part II):

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

(c) Stores including regular consumable goods (IHM, Part III). A list of these is shown in appendix 6 to these guidelines.

Regular consumable goods potentially containing Hazardous Materials comprise goods which are not integral to a ship and are unlikely to be dismantled or treated at a Ship Recycling Facility.

The Ship Recycling Facility's approach for properly managing each of the Hazardous Materials found on board a ship should be described in its SRFP.

The SRFP should describe the Ship Recycling Facility's process, control procedures and abatement methodologies used for the removal, labelling, storage, segregation, transport, treatment and disposal of all such Hazardous Materials, which should be developed in accordance with national requirements, as applicable.

It is important to describe the sequence of removal of Hazardous Materials as part of the ship recycling activities.

It is recommended that the following aspects of proper management of Hazardous Materials should be clearly addressed for each of the potentially Hazardous Materials identified above:

- identification, marking and labelling and potential on-board locations;
- recycling approach;
- removal, handling and remediation;
- storage and labelling; and
- treatment, transportation and disposal.

The Facility's approach to the safe and environmentally sound removal and treatment of any non-hazardous wastes on board should be described in the SRFP. The SRFP should describe the Facility's processes, control procedures and capabilities for removing and treating all such non-hazardous wastes, taking into account applicable IMO guidance, including but not limited to the *Comprehensive Manual on Port Reception Facilities*.

3.4.2.1 Potentially containing Hazardous Materials

The prerequisite for classification as "potentially containing Hazardous Materials" (PCHM) is "a comprehensible justification such as the impossibility of conducting sampling without compromising the safety of the ship and its operational efficiency" (paragraph 4.2.3 of the *2011 Guidelines for the Development of the Inventory of Hazardous Materials*, hereafter "the Inventory Guidelines").

The SRFP should describe how PCHMs will be treated; either:

- they will be removed, stored and treated as Hazardous Materials in accordance with the requirements of the Convention; or

- sampling and analysis will be conducted and PCHMs will be treated accordingly, based on the findings of sampling and analysis.

The basis of such a decision on how to treat PCHMs should be transparent and consistent as far as practicable. This information will need to be fully described in the Ship Recycling Plan.

3.4.2.2 Additional sampling and analysis

If, during the recycling process or in preparation for it, the Ship Recycling Facility deems it necessary, sampling, analysis and/or visual inspection should be conducted, possibly with the cooperation of the shipowner, to enable the identification of Hazardous Materials. A sampling plan should be developed describing the sampling locations, number of samples to be taken, the name of the sampler (including subcontractors) and the type of analysis to be performed.

When conducting the sampling of any possible Hazardous Materials, the samplers should be protected from exposure by the worker-safety measures required for the Hazardous Materials in question. Analysis of the samples should be performed by an accredited laboratory.

It is recommended that, in conducting additional sampling, the Ship Recycling Facility should follow the relevant part on sampling and analysis of the Inventory Guidelines.

After the sampling and analysis results are known, the Ship Recycling Facility should manage the materials appropriately according to whether they have been found to be hazardous.

3.4.2.3 Identification, marking and labelling and potential onboard locations

The Ship Recycling Facility should utilize the information in the IHM for the purposes of identifying the type, location and quantity of any Hazardous Materials and for marking and/or labelling. Asbestos, PCBs, other Hazardous Materials and ship tanks – such as crude oil tank (COT), fuel oil tank (FOT), lubricating oil tank (LOT), fresh water tank (FWT) and water ballast tank (WBT) – should be clearly marked in an easily identifiable manner.

It is recommended that the Ship Recycling Facility should ensure that it is fully aware of all the potential locations of Hazardous Materials on board ships. Examples of typical locations for many of the Hazardous Materials are provided in section 2.2 ("Indicative List") of appendix 5 ("Example of the Development Process for Part I of the Inventory for Existing Ships") of the Inventory Guidelines.

3.4.2.4 Removal, handling and remediation

The SRFP should describe how to safely remove, handle and/or clean the Hazardous Materials that have been identified on the ship, taking account of their potential adverse effects on human health and/or the environment.

Removal of Hazardous Materials should only be conducted by appropriately trained personnel following the worker-safety measures required for the Hazardous Materials in question.

Whenever in use, the space where the removal work is occurring should be isolated from other work spaces and should be clearly marked to inform all persons of the hazards in the area.

After the removal of highly toxic, explosive or reactive Hazardous Materials, decontamination or remediation of the space should be performed by trained personnel.

Methods and procedures for the removal, handling and remediation of Hazardous Materials should be established to ensure safe and environmentally sound operations in accordance with the applicable national requirements.

Pursuant to section 2.2 of the Supplement to the Document of Authorization to conduct Ship Recycling (DASR) (appendix 5 of the Convention), the SRFP should indicate the responsible personnel authorized to carry out removal of Hazardous Materials, with the certificate number or other relevant information, for each of the Hazardous Materials identified.

In the normal handling of all hazardous materials due attention should be paid to relevant occupational exposure limits.

3.4.2.5 Storage and labelling after removal

The SRFP should describe how all wastes generated from recycling activity will be kept separate from recyclable materials and equipment, labelled for clear identification and stored in appropriate conditions either temporarily or for a longer term. The SRFP should describe how the Ship Recycling Facility will avoid waste being mixed or contaminated in a way that interferes with subsequent handling, storage, treatment, recycling or disposal.

3.4.2.6 Treatment, transportation and disposal

The SRFP should demonstrate how the Ship Recycling Facility will ensure environmentally sound management of all Hazardous Materials and wastes removed from a ship at the Ship Recycling Facility. If treatment or disposal is taking place at the Ship Recycling Facility, the SRFP should describe how the materials will be managed in an environmentally sound manner and in compliance with applicable national requirements.

In situations where the Hazardous Materials and wastes are sent off site, the SRFP should describe procedures to ensure that they are transferred only to a facility authorized to deal with their safe and environmentally sound treatment and disposal.

The SRFP should identify all off-site management and disposal facilities, describe how the materials will be managed at those facilities and identify all authorizations, permits, certificates, approvals and licences required by national and other agencies authorizing the facilities to manage the wastes. The SRFP should include procedures for tracking Hazardous Materials and wastes as they are transported from the Ship Recycling Facility to their ultimate destination, and for managing and storing documentation, including that of subcontractors.

The final waste-management facilities should adhere to national standards and requirements which should take into account applicable international standards and requirements.

3.4.3 Environmentally sound management of Hazardous Materials

3.4.3.1 Asbestos and materials containing asbestos

The Ship Recycling Facility should identify the location and quantity of asbestos and materials containing asbestos by actively utilizing the IHM. Identification, marking and labelling should be conducted by the Ship Recycling Facility before asbestos and materials containing asbestos are removed.

Indicative lists of shipboard locations for asbestos are provided in the Inventory Guidelines (section 2.2.2.1 of appendix 5), and can be used as supporting material if additional assessment and sampling are required.

In order to safely remove asbestos and materials containing asbestos, the following protective measures should be taken, and the SRFP should describe how they are implemented by the Ship Recycling Facility:

.1 workers should be present who are trained and authorized in the removal of asbestos and materials containing asbestos in accordance with applicable national requirements;

.2 the removal of the asbestos and materials containing asbestos should be conducted under the monitoring and management of the Competent person;

.3 the number of workers exposed to asbestos should be limited to the necessary minimum;

.4 the area in which the removal of asbestos and materials containing asbestos is to be conducted should be isolated from the other work areas, and entry should be allowed only to appropriately trained personnel. The area should be clearly posted with a caution that asbestos removal work is occurring;

.5 if the removal work includes cutting, boring, grinding or otherwise disturbing friable asbestos and materials containing asbestos which may scatter into the environment, appropriate protection should be provided, so as not to release the asbestos in the air, by isolating the area in the room or space where the removal will occur; a common approach is as follows:

- seal the room or space with plastic sheets;
- the plastic sheets should be of sufficient strength;

- where the machines, equipment, pipes or spaces cannot be isolated or sealed (for example, a complex and narrow area under a floor plate in the engine room), partial protection may be provided with plastic sheets;

- the isolated area should be maintained under negative pressure where possible; and

- practices for dealing with materials containing asbestos under a partial pressure chamber system and the use of wet methods should be encouraged as far as possible;

.6 materials containing friable asbestos in areas such as walls and ceilings should be carefully removed, and water or an appropriate wetting agent should be applied prior to the removal of materials containing asbestos in order to prevent the asbestos from scattering into the atmosphere;

.7 personal protection equipment (PPE) for workers, including respiratory protection and special protective clothing for asbestos, should be provided;

.8 after removal of asbestos, the area should be cleaned in the following manner:

- equipment and tools should be washed/cleaned and then removed from the area;

- the asbestos and materials containing asbestos should be packed and sealed in plastic containers prior to being removed from the area;

- the plastic sheets used for isolating the area should be moistened with water and handled carefully to prevent the asbestos from scattering;

- an efficient vacuum cleaner should be used for cleaning the area, such as one equipped with a high efficiency particulate air (HEPA) filter; and

- the airborne asbestos in the air and/or space should be checked before removing the plastic isolation sheets and allowing other work to continue in the area;

.9 workers removing asbestos should properly prepare for entry into a contaminated area, and should be decontaminated before leaving the contaminated area, as follows:

- workers should not be allowed to wear street clothes in the isolated area or under their PPE;

- after completing work in the isolated area, workers should shower to remove asbestos, and then enter a separate clean area to put on their clothes; and

- work clothes should not be laundered at home; they should be bagged, labelled and laundered at an appropriate location at the Facility or off site;

.10 containers used for packing and transporting the removed asbestos materials should be properly labelled and sufficiently strong and resilient as to minimize the possibility of accidental damage or breakage during transport, which could result in the uncontained release of asbestos fibres into the atmosphere; and

.11 asbestos should not be reused or recycled, and its management and final disposal should comply with national requirements.

3.4.3.2 PCBs and materials containing PCBs

The Ship Recycling Facility should identify the location and quantity of the Hazardous Materials and wastes containing PCBs (polychlorinated biphenyls) by actively utilizing the IHM.

Indicative lists of shipboard locations for PCBs are provided in the Inventory Guidelines (section 2.2.2.2 of appendix 5), and can be used as supporting material if additional assessment and sampling are required. PCBs may be contained in the equipment and materials in both solid and liquid forms as shown on the IHM. Since PCB sampling and analytical procedures can be expensive and time consuming, it may be more economical to presume that the materials do contain PCBs and remove and manage them accordingly.

In order to safely remove PCBs and materials containing PCBs, the following protective measures should be taken and the SRFP should describe how they are implemented by the Ship Recycling Facility:

.1 workers should be specifically trained and authorized in the removal of PCBs;

.2 personal protection equipment (PPE) for workers, including respiratory protection and dermal protection, should be provided;

.3 removal of Hazardous Materials and wastes containing PCBs should be carefully performed to avoid spills, volatilization or scattering, in the following manner:

- spill prevention measures should be taken when draining or removing liquid-filled equipment, including booms, drip pans, liners and/or absorbent materials placed around the system or piece of equipment; and

- most solid materials containing PCBs can be removed by using manual, chemical or mechanical means such as blasting, scraping, cutting, stripping or gouging;

.4 thermal or "hot" methods of removal or recycling should not be used if the presence of PCB is known or suspected (for example, electric cable insulation, hydraulic oil, transformer oil and paints containing PCBs should not be burned);

.5 equipment used to remove PCB-containing materials should be decontaminated appropriately after use (a common decontamination process for equipment would be to rinse with non-polar organic solvent such as kerosene or diesel, then wash with soap and water and rinse with clean water); any water or other liquid used should be appropriately managed as waste;

.6 removed PCBs and materials containing PCBs should be appropriately stored in properly labelled, leak-proof containers that are made for transport and are sealed (liquids) or covered (solids);

.7 a separate storage area should be set up for PCB wastes, in accordance with the following points:

- Hazardous Materials and wastes containing PCBs should not be stored or kept with other Hazardous Materials and wastes;
- the storage area should be clearly marked on the exterior with warnings that it contains PCBs;
- the storage area should provide protection from rain; and
- containers should be regularly inspected for leaks and damage;

.8 containers or vehicles used for packing and transporting the removed PCB materials should be properly labelled and the possibility of accidental release during transport should be minimized; and

.9 PCBs should not be reused or recycled and their management and final disposal should comply with national requirements.

3.4.3.3 Ozone-depleting substances (ODSs)

The Ship Recycling Facility should identify the location and quantity of ozone-depleting substances (ODSs) prior to removal by actively utilizing the IHM.

The indicative list for ODSs in the Inventory Guidelines (section 2.2.2.3 of appendix 5) can be used as the supporting material if an additional survey and sampling are required.

The SRFP should describe how the Ship Recycling Facility implements the following protective measures to safely remove and manage ODSs:

.1 extraction of ODSs from the system should be done by persons who are trained and authorized for handling such materials;

.2 ODSs on board in containers, equipment and piping systems should not be released into the atmosphere;

.3 management or destruction of ODSs should comply with national requirements; and

.4 ODSs used as blowing agents and trapped in insulation foam in refrigerated areas should not be released into the atmosphere and environmentally sound management should be observed while dismantling and disposing of the foam waste.

3.4.3.4 Paints and coatings

The SRFP should describe procedures for properly managing any paints and coatings that are highly flammable or that may release toxins during cutting.

3.4.3.4.1 Anti-fouling compounds and systems (organotin compounds including tributyltin (TBT))

The Convention applies to all anti-fouling compounds and systems regulated under annex 1 of the International Convention on the Control of Harmful Anti-Fouling Systems on Ships (hereafter "the Anti-Fouling Convention"). Since the only systems currently regulated by the Anti-Fouling Convention are organotin compounds, these guidelines address the proper management of organotins only. However, similar considerations should be applied to future anti-fouling compounds that become subject to the Anti-Fouling Convention.

Organotin compounds include tributyltin (TBT), triphenyltin (TPT) and tributyltin oxide (TBTO). Organotin compounds have been commonly used as anti-fouling paint on the bottom of ships. Some ships applied the organotin compounds with a coating forming a barrier to stop such compounds from leaching into sea. Therefore, the Ship Recycling Facility should check the IHM carefully, and might inspect the hull paint.

Organotin paint should not be released into the sea or soil during the ship recycling process. If it is possible that organotin paint might be removed as a result of work (whether it is intentionally removed, or the collateral effect of some other effort, such as dragging), the work should be conducted in an environmentally sound manner to ensure that any organotin paint removed is not released into the sea.

Organotin paint may be removed using techniques such as blasting, chemical stripping or mechanical removal. However, special attention should be given to preventing scattering of the paint chips in the air or adjacent areas.

Blasted paints should be collected, stored and disposed of in an environmentally sound manner in accordance with national requirements.

3.4.3.4.2 Toxic and highly flammable paints

The removal of paints prior to cutting during ship recycling may not be necessary unless the process leads to the release of toxic compounds or the paint is highly flammable. Prior to cutting painted surfaces, the Ship Recycling Facility should check the flammability and toxicity of the paint or coating. If it is toxic or flammable, it is suggested that, prior to hot cutting, a sufficiently wide band of paint is mechanically or chemically removed (for example, through blasting, scraping or stripping) from along the cut line. Appropriate PPE should be worn, and a containment system for paint particles should be used (especially for blasting operations).

If removal is not possible or feasible, cutting can proceed in a controlled manner provided that the workers are well protected with PPEs specifically designed for breathing and eye protection.

3.4.3.5 Hazardous liquids, residues and sediments (such as oils, bilge and ballast water)

The Ship Recycling Facility should identify the location and volume of hazardous liquids remaining on board by actively utilizing the IHM. Identification, marking and labelling of the

tanks and other areas should be conducted by the Ship Recycling Facility before the liquids are removed.

The residual oil storage tank should be protected against leakage, overflow, fire and other potential accidents.

Hazardous liquids, residues and sediments in stores, tanks, machines, equipment and piping should be removed under safe and environmentally sound conditions.

Ballast water should be handled in accordance with relevant national requirements.

3.4.3.6 Heavy metals (lead, mercury, cadmium and hexavalent chromium)

As indicated in the Inventory Guidelines, heavy metals are found in batteries, galvanized materials, level switches, gyro compasses, thermometers, coatings, etc. Radioactive substances may be found in level indicators and smoke detectors.

Equipment and other instruments containing heavy metals should be removed carefully to ensure that they do not break and to avoid contamination of the environment. Reusable equipment and instruments should be stored properly. Broken equipment and instruments should be delivered to the appropriate companies for repair, recycling or disposal in accordance with national requirements.

Anodes fitted to the ship's hull as sacrificial metal should be removed in the course of block cutting and should be managed properly.

3.4.3.7 Other Hazardous Materials

Other Hazardous Materials not listed above and which are not part of the ship's structure – those materials listed in the IHM, Parts II and III – should be removed under safe conditions.

To the maximum extent possible, these materials should be removed prior to cutting according to the provisions of national laws and regulations. After the materials have been removed from ships, safe and environmentally sound methods should be used for storing and processing them; for example, electric cable insulation containing chlorinated compounds should not be burned.

3.4.4 Prevention of adverse effects to the environment

3.4.4.1 Spill prevention, control and countermeasures

The purpose of developing and implementing a programme for spill prevention, control and countermeasures is to minimize the risk of spills and leaks that could adversely impact the environment. The SRFP should include a programme that defines the Ship Recycling Facility's procedures for spill prevention, response and countermeasures. The programme should define proactive approaches to spill prevention and procedures to be implemented in the event of spills.

At a minimum, the programme should demonstrate that the Ship Recycling Facility has adequate containment and spill clean-up equipment and procedures, by identifying the following:

- containment and diversionary structures in place to prevent discharged Hazardous Materials from contaminating soil and water;
- Facility drainage areas;
- location of spill response equipment;
- environmental protection measures to be implemented during transfer and offloading of fuels;
- location of other oils and bilges;
- fuel storage locations;
- inspection and record-keeping procedures;
- security measures;
- personnel training programmes;
- spill prevention and reporting procedures; and
- the history of incidents at the Ship Recycling Facility.

As part of the procedures for spill prevention, response and countermeasures, the SRFP should 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 Ship Recycling Facility. This SRFP should include 24-hour contact information. The SRFP should include both a narrative and graphic description of the Facility layout, including the location of any water bodies or other routes of migration, the storage location of oil or other Hazardous Materials, procedures for fuel transfer from ship to shore, procedures to be implemented in the event of a spill and the types and locations of emergency-response equipment (such as absorbent materials, personal protective equipment and first-aid equipment).

By identifying the potential sources of spills or leaks, the Ship Recycling Facility can then identify proactive measures to be implemented in order to minimize the risk associated with Facility activities. It is helpful for the Ship Recycling Facility to review the potential sources for spills and leaks and to determine the types of failures associated with them in order to determine the most appropriate and effective prevention measures. For example, drums should not be left open unless being filled, should be within a secondary containment or beamed structure and should not be exposed to rainfall that could corrode them over time.

The programme for spill prevention, control and countermeasures can be used as a tool by the Ship Recycling Facility to communicate practices on preventing and responding to spills and leaks, as a resource during emergency response and as a repository for information on storage, inspection and testing. It is important to maintain records on maintenance, inspections and employee training. Periodic review of the programme for spill prevention, control and countermeasures is also an effective tool for determining which procedures are fulfilling their intended function and for identifying weaknesses in the programme.

3.4.4.2 Storm-water pollution prevention

Storm-water run-off from industrial facilities has the potential to adversely affect the environment. Improper storage and handling of Hazardous Materials and wastes could increase the risk of environmental degradation through contact with water. The SRFP should include a programme that defines measures to be implemented and maintained to minimize the potential for storm-water contamination at the Ship Recycling Facility.

A programme for the prevention of storm-water pollution should include the identification of all potential pollutant sources at the Ship Recycling Facility that could come into contact with storm water, with the nearby receiving waters and with storm water-conveyance systems. A site map should be developed that depicts such information.

Following compilation of the relevant site information, an assessment should be conducted in order to determine the appropriate control measures. Control measures should be implemented to reduce the threat of storm-water pollution, to control erosion and sediment and to protect nearby natural resources. Control measures can include best management practices, maintenance and inspection programmes, employee training and reporting.

As an example, a potential pollutant source at a Ship Recycling Facility is the storage of drums, tanks or other containers for the offloading of fuel from a ship. The activity of transferring and storing the fuel includes multiple potential pollutant sources, such as spills and leaks during transfer to the water or the ground, leaking drums or containers or run-off from the drum storage area. Control measures to minimize the risk to the environment from storm-water contamination could include storing drums and other containers under semi-permanent or permanent coverings, controlling spills or run-off from drum storage areas with appropriately sized secondary containment, conducting routine inspections of drum storage areas and establishing appropriate clean-up procedures in the event of spills or leaks.

The development of preventive measures is the most effective way to minimize the discharge of pollutants via storm water. It is important to maintain records on maintenance, inspections and employee training. Periodic review of the storm-water management programme is also an effective tool for determining which best management practices are fulfilling their intended function and for identifying weaknesses in the programme.

3.4.4.3 Debris prevention and control

The introduction of debris into the marine environment by ship recycling activities has the potential to adversely affect the environment. The SRFP should include a programme that defines measures to be implemented and maintained to minimize the potential for debris deposition into the water, including the maintenance of areas from which debris might be transported into the marine environment by wind, storm drains, tides or run-off. Control measures should be implemented to reduce the likelihood of debris deposition.

3.4.4.4 Incident and spills reporting procedures

The SRFP should describe the procedures for reporting incidents and spills, including at a minimum the following information:

- how duties and responsibilities are assigned to the Ship Recycling Facility's responsible team, department or persons and their reporting responsibilities in the event of an incident;

- how the reporting procedures relate to the emergency preparedness and response plan (EPRP);
- communication link to the local community for any necessary assistance; and
- procedures for providing information to the public and for carrying out post-incident surveys and releasing post-incident reports.

APPENDIX 1

RECOMMENDED FORMAT OF THE SHIP RECYCLING FACILITY PLAN

SHIP RECYCLING FACILITY PLAN

1 Facility management

1.1 Company information
1.2 Training programme
1.3 Worker management
1.4 Records management

2 Facility operation

2.1 Facility information
2.2 Permits, licences and certification
2.3 Acceptability of ships
2.4 Ship Recycling Plan (SRP) development
2.5 Vessel arrival management
2.6 Ship recycling methodology
2.7 Reporting upon completion

3 Worker safety and health compliance approach

3.1 Worker health and safety
3.2 Key safety and health personnel
3.3 Job hazard assessment
3.4 Prevention of adverse effects to human health
- 3.4.1 Safe-for-entry procedures
  - 3.4.1.1 Safe-for-entry criteria
  - 3.4.1.2 Competent person for Safe-for-entry determination
  - 3.4.1.3 Safe-for-entry inspection and testing procedures
  - 3.4.1.4 Oxygen
  - 3.4.1.5 Flammable atmospheres
  - 3.4.1.6 Toxic, corrosive, irritant or fumigated atmospheres and residues
  - 3.4.1.7 Safe-for-entry determination by a Competent person
  - 3.4.1.8 Safe-for-entry certificate, warning signs and labels
  - 3.4.1.9 Safe-for-entry operational measures
- 3.4.2 Safe-for-hot-work procedures
  - 3.4.2.1 Safe-for-hot-work criteria
  - 3.4.2.2 Competent person for Safe-for-hot-work determination
  - 3.4.2.3 Safe-for-hot-work inspection, testing and determination
  - 3.4.2.4 Safe-for-hot-work certificate, warning signs and labels
  - 3.4.2.5 Safe-for-hot-work operational measures
- 3.4.3 Welding, cutting, grinding and heating
- 3.4.4 Drums, containers and pressure vessels
- 3.4.5 Prevention of falling from heights and accidents caused by falling objects
- 3.4.6 Gear and equipment for rigging and materials handling
- 3.4.7 Housekeeping and illumination

3.4.8 Maintenance and decontamination of tools and equipment
3.4.9 Health and sanitation
3.4.10 Personal protective equipment
3.4.11 Worker exposure and medical monitoring
3.5 Emergency preparedness and response plan
3.6 Fire and explosion prevention, detection and response

4 Environmental compliance approach

4.1 Environmental monitoring
4.2 Management of Hazardous Materials
4.2.1 Potentially containing Hazardous Materials
4.2.2 Additional sampling and analysis
4.2.3 Identification, marking and labelling and potential on-board locations
4.2.4 Removal, handling and remediation
4.2.5 Storage and labelling after removal
4.2.6 Treatment, transportation and disposal
4.3 Environmentally sound management of Hazardous Materials
4.3.1 Asbestos and materials containing asbestors
4.3.2 PCBs and materials containing PCBs
4.3.3 Ozone-depleting substances (ODSs)
4.3.4 Paints and coatings
4.3.4.1 Anti-fouling compounds and systems (organotin compounds including tributyltin (TBT))
4.3.4.2 Toxic and highly flammable paints
4.3.5 Hazardous liquids, residues and sediments (such as oils, bilge, and ballast water)
4.3.6 Heavy metals (lead, mercury, cadmium and hexavalent chromium)
4.3.7 Other Hazardous Materials
4.4 Prevention of adverse effects to the environment
4.4.1 Spill prevention, control and countermeasures
4.4.2 Storm-water pollution prevention
4.4.3 Debris prevention and control
4.4.4 Incident and spills reporting procedures

Plan Attachments

Facility Map
Organizational Flow Chart
Permits, Licences and Certification
Resumes

APPENDIX 2

EXAMPLE FORMAT OF FACILITY INFORMATION IN SRFP

(relating to sections 3.2.1 (Facility information) and 3.2.2 (Permits, licences and certification))

Facility name and contact information			
Facility name			
Registered address			
Facility address			
Representative and communication address			
Number of employees			
Tel. No.		Fax No.	
E-mail address		URL	
Working language			

Capacity of Facility	
Maximum capacity of ship to be recycled	DWT GT LDT Length Breadth Width Depth
Types of ship to be accepted Annual recycling capacity (in LDT)	

Waste management capacity	
Asbestos	removal storage process
Ozone-depleting substances	removal storage process
Polychlorinated biphenyls (PCB)	removal storage process
Anti-fouling compounds and system	removal storage process

Cadmium and Cadmium Compounds	removal storage process
Hexavalent Chromium and Hexavalent Chromium Compounds	removal storage process
Lead and Lead Compounds	removal storage process
Mercury and Mercury Compounds	removal storage treatment process
Polybrominated Biphenyl (PBBs)	removal storage treatment process
Polybrominated Diphenyl Ethers (PBDEs)	removal storage treatment process
Polychlorinated Naphthalenes (more than 3 chlorine atoms)	removal storage treatment process
Radioactive substances	removal storage treatment process
Certain Shortchain Chlorinated Paraffins (Alkanes, C10-C13, chloro)	removal storage treatment process
Hazardous liquids, residues and sediments	removal storage treatment process
Paints and coatings that are highly flammable and/or lead to toxic release	removal storage treatment process
Other Hazardous Materials not listed above and that are not a part of the ship structure (specify)	removal storage treatment process

Facility equipment and other information			
Area of Facility (m^2)*		Area of pavement (m^2)	
Description of ship recycling facility (layout, waterdepth, accessibility, etc.)			

Heavy lifting machines	e.g. Jib crane: 60 tons
	Mobile crane: 35 tons×1, 27 tons×1
	Hydraulic backhoe: SH400, ZX330, SK220, ZX200 With Shear, Magnet
	Hydraulic shear: 600 tons×1
	Weight bridge: 50 tons
Boat	e.g. Gross tonnage: 5 tons, Power: 240 PS
Shear	e.g. Capacity: 600 tons
O_2 supply	e.g. Liquid O_2 supply system: 10 m^3
Gas supply	e.g. LPG bottles
Compressed air	
Fire extinguisher	e.g. Portable fire extinguisher
Waste oil treatment	e.g. Oil water separation tank Tank capacity: abt. 20 tons
Wastes storage	e.g. Container for asbestos: 2
Incinerator	e.g. none
Electric power supply	e.g. Substation

Location	
Division and classification of the location	e.g. urbanization control area
Peripheral environment	e.g. factories: former quarry, two marinas in the vicinity
	Housing: private houses at the entrance and 200 m from entrance

Facility certificate and licence (if applicable specify: certifying authority; date of expiry; number of certificate; etc.)[2]	

Workers' certificates/licences	
Certificate/licence	Name
1) Manager of asbestos handling	Mr. Yxxxx ****** 1 person
2) Manager of PCB handling	Mr. Yxxxx ****** 1 person
3) Designated chemicals handling	None
4) Asbestos handling class	Mr. ***** *****
	Mr. ***** *****
	Mr. ***** ***** 3 persons
5) Gas cutting	Mr. ***** *****
	Mr. ***** *****
	Mr. ***** ***** 3 persons
6) Welding	Mr. ***** ***** 1 person

[2] List here any applicable certificates, for example relevant to waste treatment, waste transportation, or other, such as certificates relevant to management systems of environmental performance, and/or occupational health and safety.

7) Zinc handling	Mr. ***** ***** 1 person
8) Lifting	Mr. ***** *****
	Mr. ***** *****
	Mr. ***** ***** 3 persons
9) Heavy lift machines	Mr. ***** *****
	Mr. ***** ***** 2 persons
10) Seafarer	Mr. ***** ***** 1 person
11) Diver	None
12) Removal of Hazardous Materials (Material A)	Mr. ***** ***** 2 persons
(Material B)	Mr. ***** ***** 2 persons

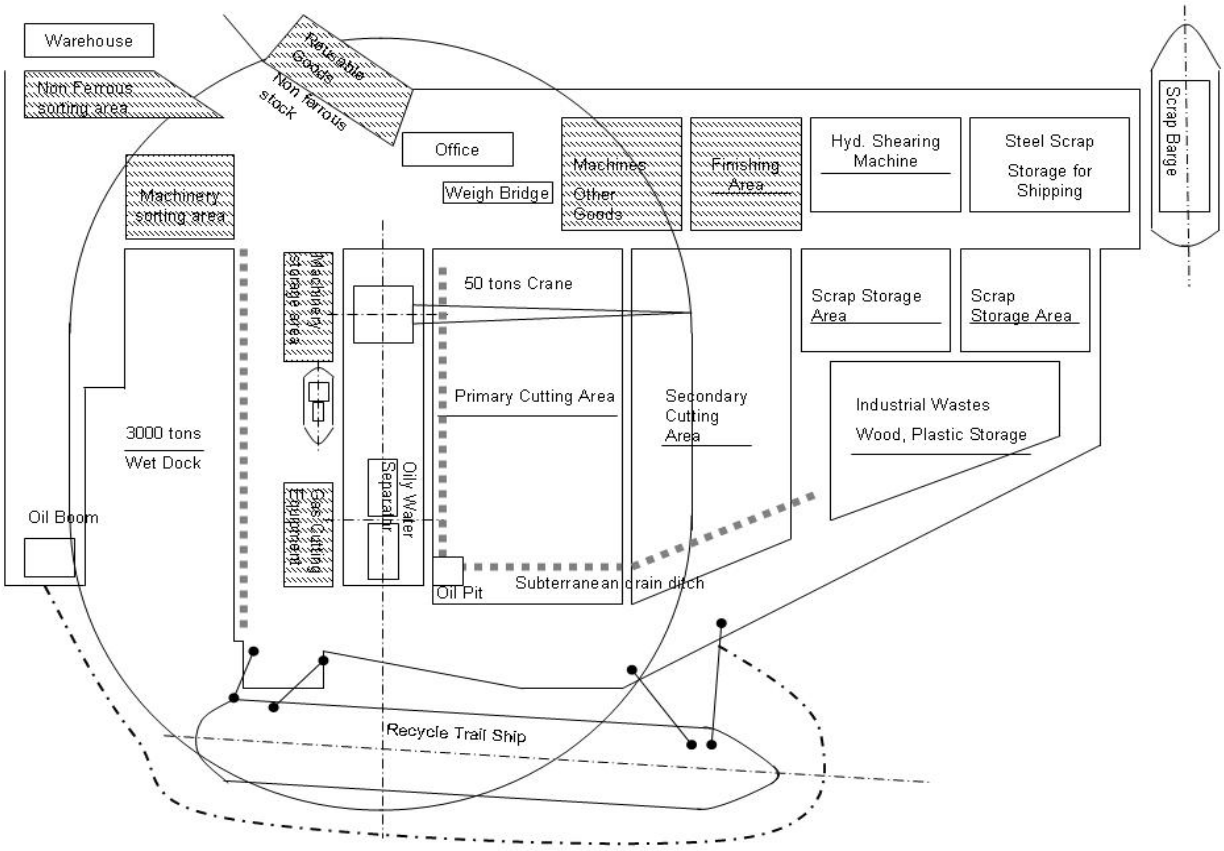
Subcontractor information[3]			
Subcontractor name			
Registered address			
Representative and communication address			
Field of services			
Licences for services			
Number of employees			
Tel. No.		Fax No.	
E-mail address		URL	

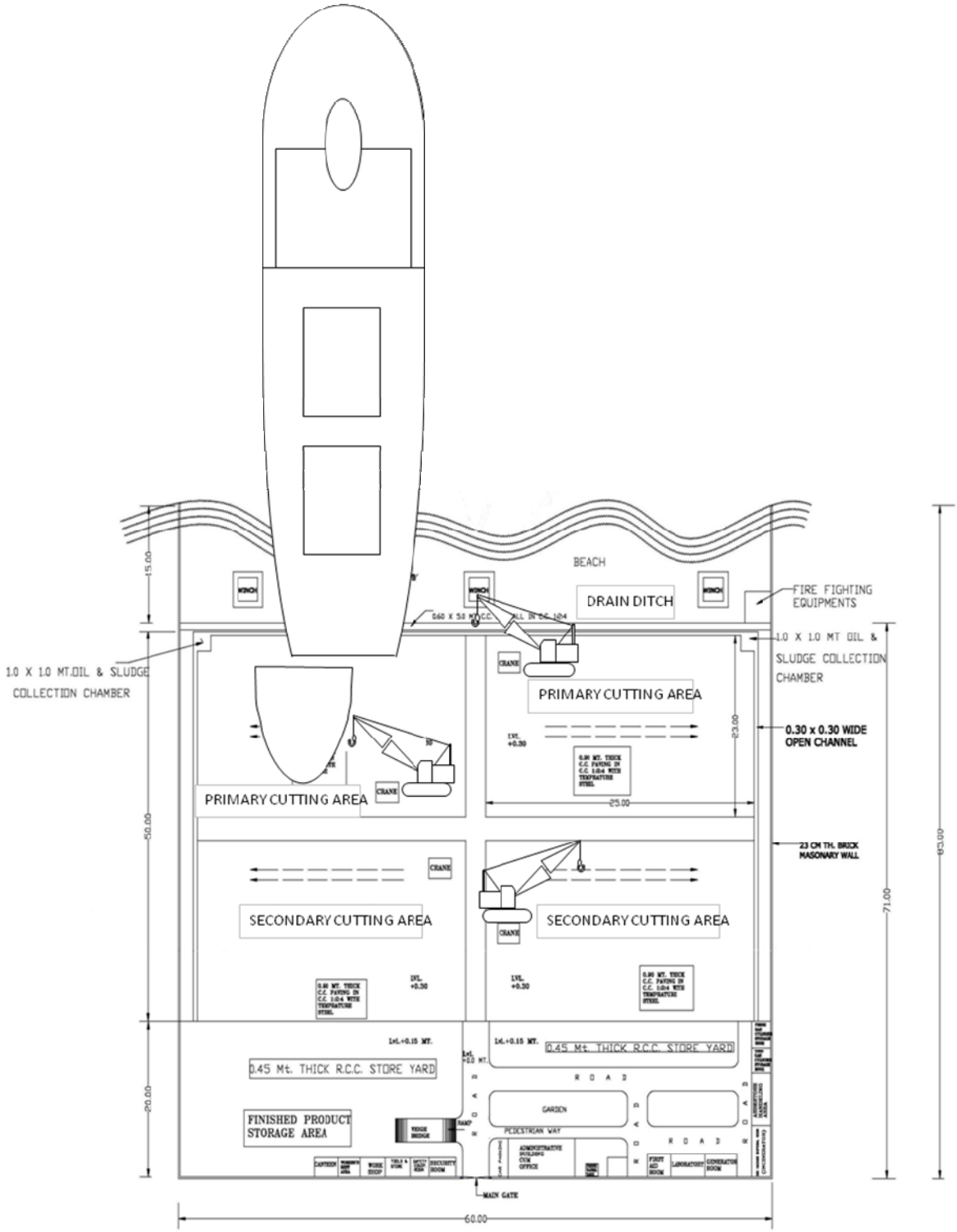
[3] Supply all pertinent information relevant to the services of the subcontractor to the ship recycling facility.

Location Map

Yard plan (examples)

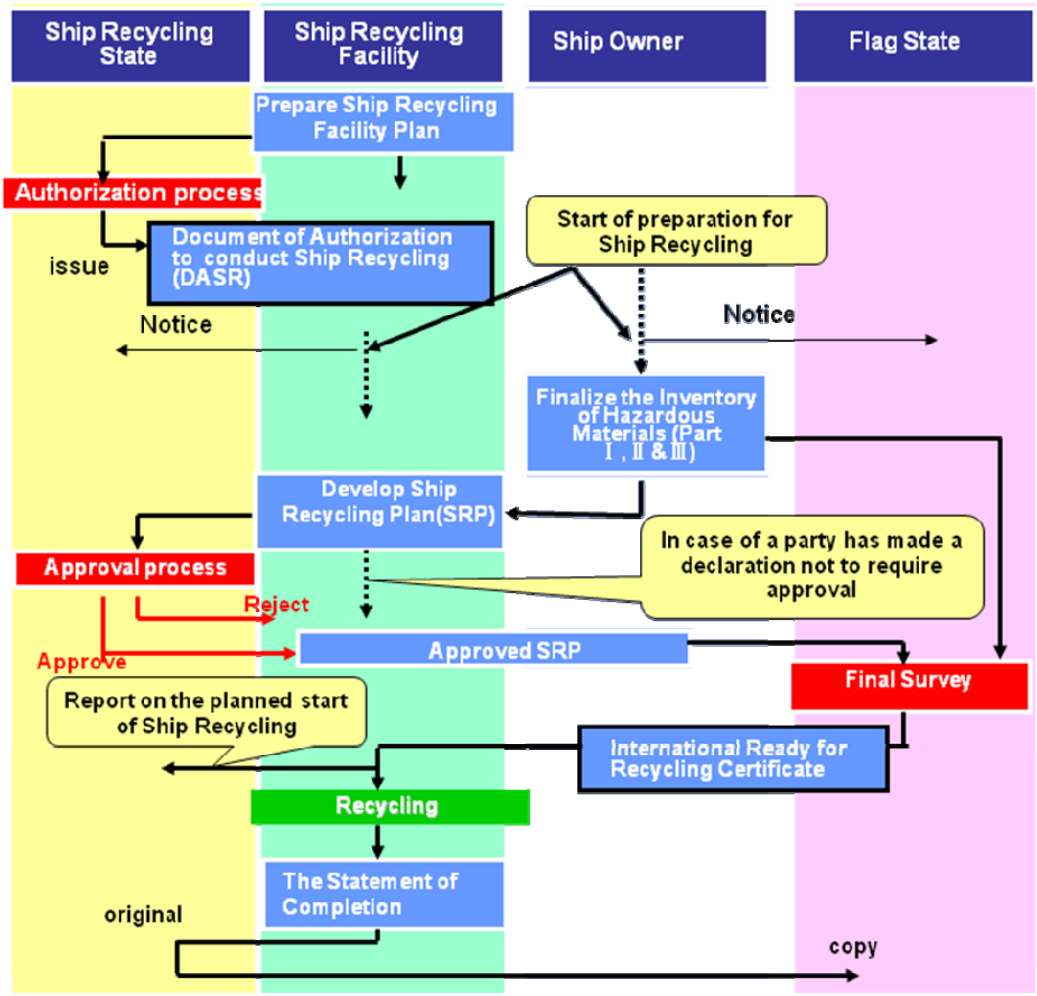
Yard plan should be included in Facility information.




BEACH
DRAIN DITCH
FIRE FIGHTING EQUIPMENTS
1.0 X 1.0 MT.OIL & SLUDGE COLLECTION CHAMBER
1.0 X 1.0 MT OIL & SLUDGE COLLECTION CHAMBER
PRIMARY CUTTING AREA
PRIMARY CUTTING AREA
0.30 x 0.30 WIDE OPEN CHANNEL
23 CM TH. BRICK MASONARY WALL
SECONDARY CUTTING AREA
SECONDARY CUTTING AREA
0.45 Mt. THICK R.C.C. STORE YARD
0.45 Mt. THICK R.C.C. STORE YARD
FINISHED PRODUCT STORAGE AREA
GARDEN
PEDESTRIAN WAY
ROAD
ROAD
MAIN GATE
60.00
50.00
20.00
15.00
23.00
25.00
71.00
83.00

APPENDIX 3

SHIP RECYCLING PROCESS FROM PREPARATION TO COMPLETION



Responsibility of Stakeholders			
Regulation 16 -Authorize the Ship Recycling Facilities Regulation 9 -Approve SRP Regulation 25 -Send a copy of the Statement to the flag State	Regulation 18 -Prepare an SRFP Regulation 9 -Develop a ship-specific SRP Regulation 24 -Notify its Competent Authority of the intent -Report to its Competent Authority the planned start of Ship Recycling Regulation 25 - Issue a statement of Completion and report to its Competent Authority	Regulation 5 -Have on board an Inventory of Hazardous Materials -Finalize Inventory of Hazardous Materials including Parts Ⅱ & Ⅲ Regulation 8 -Provide the information with the SRF	Regulation 10 -Verify Inventory of Hazardous Materials, SRP and DASR

APPENDIX 4

RELEVANT INSTRUMENTS OF THE INTERNATIONAL LABOUR ORGANIZATION (ILO)

Fundamental ILO Conventions

Worst Forms of Child Labour Convention, 1999 (No. 182)
Minimum Age Convention, 1973 (No. 138)
Discrimination (Employment and Occupation) Convention, 1958 (No. 111)
Abolition of Forced Labour Convention, 1957 (No. 105)
Equal Remuneration Convention, 1951 (No. 100)
Right to Organise and Collective Bargaining Convention, 1949 (No. 98)
Freedom of Association and Protection of the Right to Organise Convention, 1948 (No. 87)
Forced Labour Convention, 1930 (No. 29)

Conventions on occupational safety and health and working conditions

Promotional Framework for Occupational Safety and Health Convention, 2006 (No. 187)
Prevention of Major Industrial Accidents Convention, 1993 (No. 174)
Night Work Convention, 1990 (No. 171)
Chemicals Convention, 1990 (No. 170)
Asbestos Convention, 1986 (No. 162)
Occupational Health Services Convention, 1985 (No. 161)
Protocol of 2002 to the Occupational Safety and Health Convention, 1981 (No. 155)
Occupational Safety and Health Convention, 1981 (No. 155)
Collective Bargaining Convention, 1981 (No. 154)
Occupational Safety and Health (Dock Work) Convention, 1979 (No. 152)
Working Environment (Air Pollution, Noise and Vibration) Convention, 1977 (No. 148)
Occupational Cancer Convention, 1974 (No. 139)
Benzene Convention, 1971 (No. 136)
Workers' Representatives Convention, 1971 (No. 135)
Maximum Weight Convention, 1967 (No. 127)
Employment Injury Benefits Convention, 1964 (No. 121)
Guarding of Machinery Convention, 1963 (No. 119)
Radiation Protection Convention, 1960 (No. 115)

ILO codes of practice

Safety and health in ports, 2005. ISBN 92-2-115287-1.
Contents overview: management of safety and health; safe systems of work; port infrastructure, plant and equipment; lifting appliances and loose gear; safe use of lifting appliances and loose gear; operations afloat; health; personal welfare facilities; emergency arrangements; testing of lifting appliances and loose gear.

Safety and health in shipbreaking: Guidelines for Asian countries and Turkey, 2004. ISBN 92-2-115289-8 (print version), ISBN 92-2-115671-0 (web version).
Contents overview: general responsibilities, duties and rights, and framework; Occupational safety and health management; occupational health services; operational planning; preventive and protective measures; management of hazardous substances; measures against physical, biological, ergonomic and psychosocial hazards; safety requirements for tools, machines and equipment; competence and training; personal protective equipment and protective clothing; contingency and emergency preparedness; special protection; welfare.

Safety and health in the non-ferrous metal industries, 2003. ISBN 92-2-111640-9.
Contents overview: general principles of prevention and protection; prevention and protection specific to non-ferrous metals production processes; recycling non-ferrous metals; occupational exposure limits for hazardous substances, electric and magnetic fields, optical radiation, heat noise and vibration.

Ambient factors in the workplace, 2001. ISBN 92-2-111628-X
Contents overview: general obligations, responsibilities, duties and rights; general principles of prevention and control; hazardous substances; ionising radiation; electric and magnetic fields; optical radiation; heat and cold; noise; vibration; occupational exposure limits.

Management of alcohol- and drug-related issues in the workplace, 1996. ISBN 92-2-109455-3.
Contents overview: development of an alcohol and drug policy for the work place; measures to reduce alcohol- and drug-related problems through good employment practices; restrictions on alcohol, legal and illegal drugs in the workplace; prevention through information, education and training programmes.

Accident prevention on board ship at sea and in port, 1996. ISBN 92-2-109450-2
Contents overview: shipboard emergencies and emergency equipment; safe access to ship; safe movement about the ship; entering and working in enclosed or confined spaces; manual lifting and carrying; tools and materials; welding, flame-cutting and other hot work; working aloft and over side; working with dangerous and irritating substances and radiations; upkeep of wire and fibre ropes; working in machinery spaces.

Recording and notification of occupational accidents and diseases, 1996. ISBN 92-2-109451-0.
Contents overview: recording, notification and investigation of occupational accidents, occupational diseases and dangerous occurrences, and related statistics.

Safety in the use of chemicals at work, 1993. ISBN 92-2-108006-4.
Contents overview: classification systems; labelling and marking; chemical safety data sheets; operational control measures; work systems and practices; personal protection; monitoring in the workplace; medical and health surveillance; investigation and reporting of accidents, occupational diseases and other incidents.

Safety, health and working conditions in the transfer of technology to developing countries, 1988. ISBN 92-2-106122-1
Contents overview: appendix A: Occupational safety and health check-list for hazard control in the design and operation of a plant or process.

Safety in the use of asbestos, 1984. ISBN 92-2-103872-6.
Contents overview: exposure limits; monitoring in the workplace; general preventive methods; personal protection; cleaning of premises and plant; packaging, transport and storage; disposal of asbestos waste; supervision of the health of workers; handling of asbestos fibre in ports and container terminals; construction, demolition and alteration work; exposure limits in various countries.

Occupational safety and health in the iron and steel industry, 1983. ISBN 92-2-103471-2
Contents overview: basic requirements for work stations, workplaces, traffic lanes and installations; maintenance, repair and demolition; electricity, tools, machine guarding and gas systems; transport and handling; substances and agents harmful to health; working clothes and personal protective equipment; medical services and supervision, safety and health organization, hygiene and welfare.

Safety and health in shipbuilding and ship repair, 1974. ISBN 92-2-101199-2.
Contents overview: workplaces, their approaches and equipment; scaffolding and staging; ladders, stairs, gangways and ramps; lifting appliances; ropes chains and accessories; hand tools, portable power-driven tools; work with dangerous and irritating substances and radiations; welding, flame cutting and other hot work; work in confined spaces and dangerous atmospheres; transport of workers by water; working clothes and personal protective equipment; medical services and supervision, safety and health organization, hygiene and welfare.

Other guidelines

Guidelines on occupational safety and health management systems, ILO-OSH 2001. ISBN 92-2-111634-4.
Contents overview: the occupational safety and health management system in the organisation; policy; organizing; planning and implementation; evaluation; action for improvement.

APPENDIX 5

RELEVANT INSTRUMENTS AND REFERENCE MATERIALS OF THE UNITED NATIONS ENVIRONMENT PROGRAMME (UNEP) AND OTHERS

Instruments

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

Stockholm Convention on Persistent Organic Pollutants (POPs), 2001

Montreal Protocol on Substances that Deplete the Ozone Layer, 1987

Reference Materials[4]

Technical Guidelines for the Environmentally Sound Management of the Full and Partial Dismantling of Ships
http://www.basel.int/Portals/4/Basel%20Convention/docs/meetings/sbc/workdoc/techgships-e.pdf

Training Resource Pack for Hazardous Waste Management in Developing Countries
http://www.basel.int/pub/pub.html

Updated General Technical Guidelines for the Environmentally Sound Management of Wastes Consisting of, Containing or Contaminated with Persistent Organic Pollutants (POPs)
http://www.basel.int/Portals/4/Basel%20Convention/docs/pub/techguid/tg-POPs.pdf

Updated Technical Guidelines for the Environmentally Sound Management of Wastes Consisting of, Containing or Contaminated with Polychlorinated Biphenyls (PCBs), Polychlorinated Terphenyls (PCTs) or Polybrominated Biphenyls (PBBs)
http://www.basel.int/Portals/4/Basel%20Convention/docs/pub/techguid/tg-PCBs.pdf

Technical Guidelines for the Environmentally Sound Management of Wastes Consisting of Elemental Mercury and Wastes Containing or Contaminated with Mercury
http://www.basel.int/Implementation/TechnicalMatters/DevelopmentofTechnicalGuidelines/AdoptedTechnicalGuidelines/tabid/2376/Default.aspx

Basel Convention Technical Guidelines on Waste Oils from Petroleum Origins and Sources
http://www.basel.int/Portals/4/Basel%20Convention/docs/meetings/sbc/workdoc/old%20docs/tech-y8.pdf

Technical Guidelines for the Environmentally Sound Management of Waste Lead-acid Batteries
http://www.basel.int/Portals/4/Basel%20Convention/docs/pub/techguid/tech-wasteacid.pdf

Basel Convention Technical Guidelines on Used Oil Re-refining or Other Re-uses of Previously Used Oil
http://www.basel.int/Portals/4/Basel%20Convention/docs/meetings/sbc/workdoc/old%20docs/tech-r9.pdf

[4] A full set of the Basel Convention Technical Guidelines can be accessed at: http://www.basel.int/Implementation/TechnicalMatters/DevelopmentofTechnicalGuidelines/AdoptedTechnicalGuidelines/tabid/2376/Default.aspx.

Technical Guidelines on the Environmentally Sound Recycling/Reclamation of Metals and Metal Compounds
http://www.basel.int/Portals/4/Basel%20Convention/docs/pub/techguid/r4-e.pdf

Technical Guidelines on the Environmentally Sound Management of Biomedical and Healthcare Wastes
http://www.basel.int/Portals/4/Basel%20Convention/docs/pub/techguid/tech-biomedical.pdf

Basel Convention Technical Guidelines on Specially Engineered Landfill
http://www.basel.int/Portals/4/Basel%20Convention/docs/meetings/sbc/workdoc/old%20docs/tech-d5.pdf

Basel Convention Technical Guidelines on Incineration on Land
http://www.basel.int/Portals/4/Basel%20Convention/docs/meetings/sbc/workdoc/old%20docs/tech-d10.pdf

Basel Convention Technical Guidelines on Hazardous Waste – Physico-Chemical Treatment — Biological Treatment
http://www.basel.int/Portals/4/Basel%20Convention/docs/meetings/sbc/workdoc/old%20docs/tech-d8d9.pdf

United Nations Recommendations on the Transport of Dangerous Goods
http://www.unece.org/trans/danger/publi/unrec/English/Recommend.pdf

United Nations Globally Harmonized System for the Classification and Labelling of Chemicals (GHS)
http://www.unece.org/trans/danger/publi/ghs/ghs_rev03/03files_e.html

APPENDIX 6

MATERIALS FOUND ON BOARD SHIPS THAT THE SHIP RECYCLING FACILITY SHOULD BE PREPARED TO HANDLE (INCLUDED IN PART III OF THE INVENTORY OF HAZARDOUS MATERIALS)

Kerosene
White spirit
Lubricating oil
Hydraulic oil
Anti-seize compounds
Fuel additive
Engine coolant additives
Antifreeze fluids
Boiler and feed water treatment and test reagents
Deionizer-regenerating chemicals
Evaporator dosing and descaling acids
Paint stabilizers/rust stabilizers
Solvents/thinners
Paints
Chemical refrigerants
Battery electrolyte
Alcohol/methylated spirits
Acetylene
Propane
Butane
Oxygen
Carbon dioxide
Perfluorocarbons (PFCs)
Methane
Hydrofluorocarbons (HFCs)
Nitrous oxide (N_2O)
Sulfur hexafluoride (SF_6)
Bunkers, e.g. fuel oil
Grease
Fuel gas
Batteries (including lead-acid batteries)
Pesticides/insecticide sprays
Extinguishers
Chemical cleaner (including electrical equipment cleaner, carbon remover)
Detergent/bleacher (potentially a liquid)
Miscellaneous medicines
Fire-fighting clothing and personal protective equipment
Spare parts containing Hazardous Materials

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