INTERNATIONAL MARITIME ORGANIZATION

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MARINE ENVIRONMENT PROTECTION COMMITTEE
59th session
Agenda item 3

MEPC 59/3/1
9 April 2009
Original: ENGLISH

RECYCLING OF SHIPS

Report of the correspondence group on ship recycling guidelines (Part II)

Submitted by Japan

SUMMARY	
Executive summary:	This report summarizes the work of the correspondence group on ship recycling guidelines established by MEPC 58
Strategic direction:	7.1
High-level action:	7.1.2
Planned output:	7.1.2.2
Action to be taken:	Paragraph 35
Related documents:	MEPC 58/23, MEPC 58/3/8, MEPC 58/INF.18; MEPC 56/21, MEPC 56/3/4, MEPC 56/3/5, MEPC 56/3/6 and MEPC-ISRWG 2/3

Introduction

1 This document is the second part of the report of the intersessional correspondence group on ship recycling guidelines, as established by MEPC 58 (MEPC 58/23, paragraph 19.26). The summary of discussion for development of "Guidelines for Safe and Environmentally Sound Ship Recycling" (hereinafter "Facility Guidelines") is provided below.

Summary of discussion for development of Facility Guidelines

2 MEPC 56 agreed that the Japanese documents (the draft Facility Guidelines included MEPC 56/3/4 and MEPC 56/3/5) should be the bases and that other two documents (MEPC 56/3/6 (United States) and MEPC-ISRWG 2/3 (Denmark)) should be integrated as relevant in the further development of the guidelines (based on MEPC 56/23, paragraph 3.38). After MEPC 56, Japan worked on an "integrated" document which changed the structure and formulation of the Japanese documents, and developed the revised draft. The initial document circulated for round 1 was this revised draft. In round 1, the United States proposed a different formulation of the guidelines (illustrated in figure 1, with narrative provided in annex 1 to this

document) in which ship recycling facility could show to the Competent Authority the compliance with the convention by the comprehensive SRFP (Ship Recycling Facility Plan) with four sets of sub-plans (General Management Plan, Operational Plan, Worker Safety and Health Plan, and Environment Compliance Plan); this proposal was based on their previous submission (MEPC 56/3/6). At the same time, the original proposal that was circulated at round 1 was regarded as too prescriptive, while the quality and usefulness of the initial document was recognized.

3 Because of the fundamental nature of this comment, only the general structure of the Facility Guidelines, putting aside the questions on the details, was presented for discussion at round 2 – 1st step. The proposal by the coordinator was to mix the United States' concept with the original proposal by listing the United States' sub-plans in the appendices of the Facility Guidelines, as illustrated in figure 2 and contained in annex 2 (it is listed in this document for reference purpose only). As a result of the 2nd round – 1st step, the group was of the view that further consideration should be given to the structure proposed by the United States (the United States' proposal as a stand-alone alternative rather than appendices), before the group move to complete the draft Facility Guidelines.

4 Several questions were set by the coordinator to further analyse the United States' proposal at the 2nd round – 2nd step. All the comments received were positive, and the consideration is summarized as follows. There is a general agreement to use the formulation in figure1 (plus annex 1) as the Base Option for the structure of the Facility Guidelines.

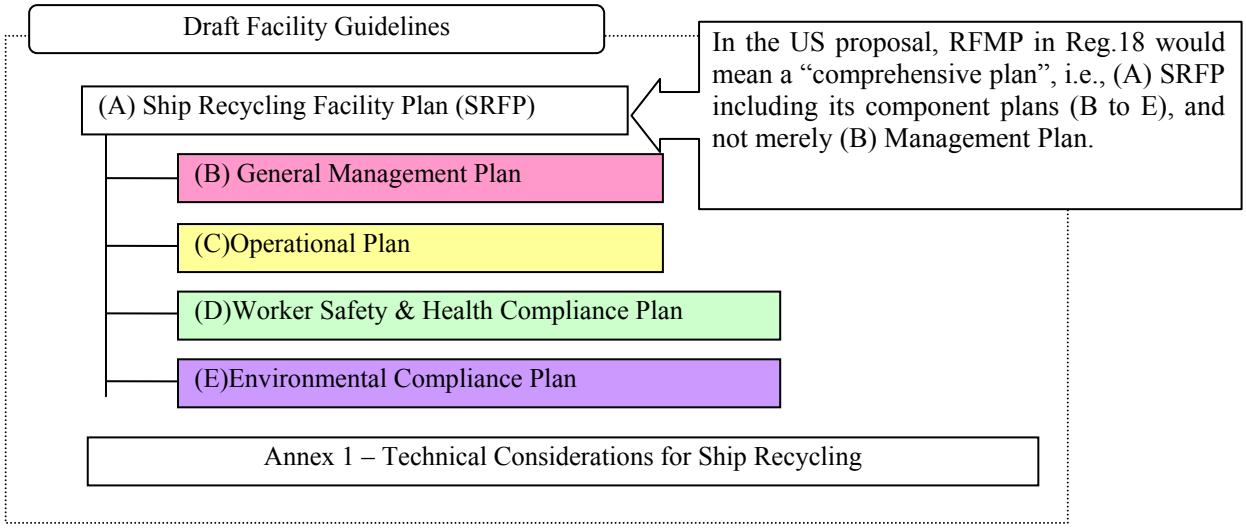
Review of the "Base Option" (originally the United States' proposal)

5 The following explanation was provided by the United States[1]:

> *In accordance with the implementing legislation and regulation of the State, the Ship Recycling Facility (SRF) submits documentation to the Competent Authority that it complies with the requirements of the convention. We suggest that this should be accomplished through a comprehensive Ship Recycling Facility Plan (SRFP) that contains the following major components (and the relevant Convention regulations are identified in parentheses):*
>
> - *General Management Plan (regulations 17, 18)*
> - *Operational Plan (regulations 18, 24, 25)*
> - *Worker Safety and Health Compliance Plan (regulations 19, 21, 22, 23)*
> - *Environmental Compliance Plan (regulations 19, 20, 23)*

[1] The exact excerpts of the group members' comments are given in italics.

Figure1 – Base Option

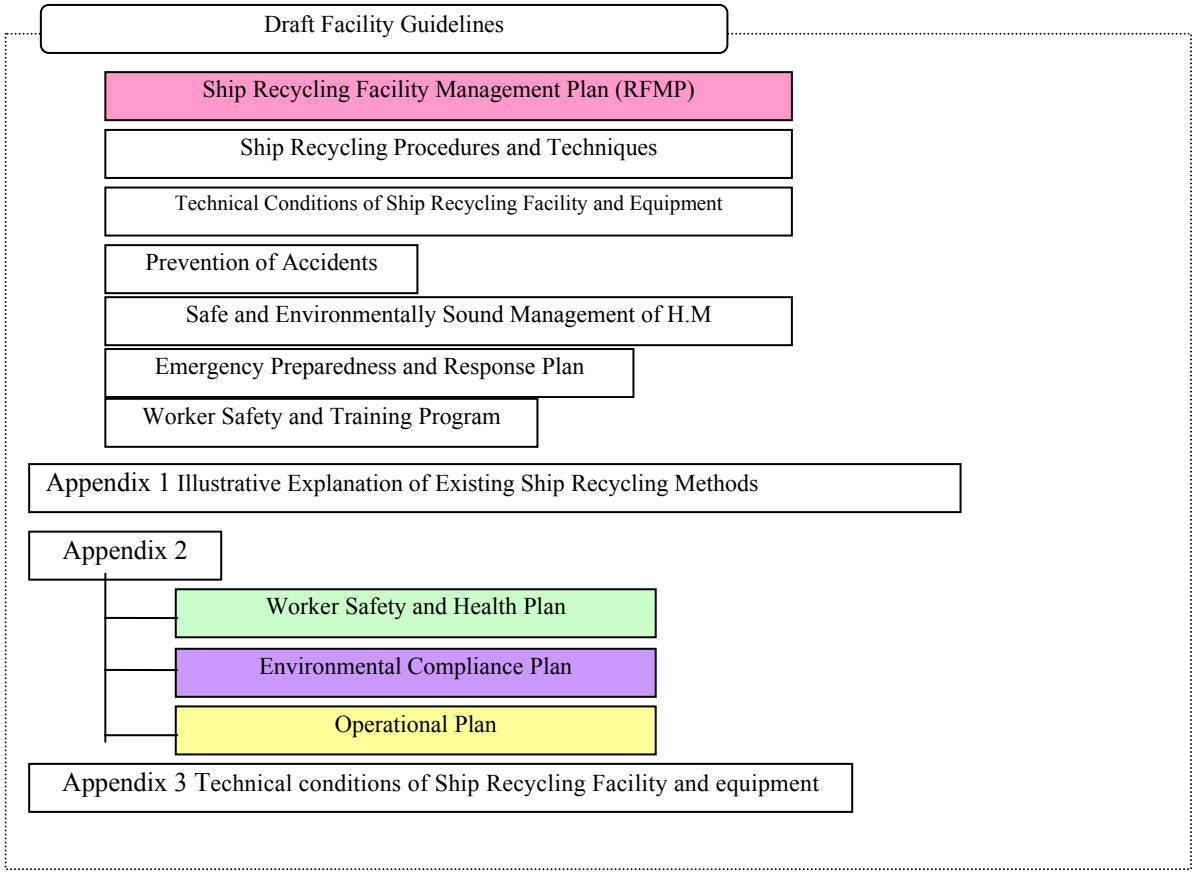


NOTE: The references to the plans (A), (B).. (E) were added by the coordinator, to make it easy for the group to refer to a particular plan.

6 The primary advantage of the United States' proposal, based on the comments collected, would be:

- this can be an effective tool for how a Ship Recycling Facility should demonstrate the compliance with the requirements of the Convention and therefore it can be the basis for issuing the Document of Authorization for the facility; and
- it can avoid a prescriptive approach.

Figure 2 – <Round 2 – 1st step proposal > (for reference purpose only)



7 The difference between the two is, to a large extent, due to difference of interpretation on the structure of chapter 3 of the Convention, especially on regulation18 on RFMP.

The further explanation was provided by the United States as follows:

We [The US] believe it [Pre-2nd round proposal by the coordinator] misses the fundamental obligation on the facility to develop a comprehensive recycling plan, not just a "management plan", as discussed above. The suggested outline also mixes planning documents and technical criteria in the body of the guidance, while leaving the most important compliance elements in appendix 2. It doesn't make sense to feature the general management plan as a chapter in the main guidance, while leaving the critical operational, safety, and environmental considerations to an appendix.

8 It is considered that many (including Japan) had interpreted in the previous discussion that RFMP in regulation 18 means the "General Management Plan" corresponding to (B) of the Base Option, rather than a comprehensive plan (A). The Base Option presumes that RFMP in regulation 18 is equal to SRFP in figure 1. This difference was the first issue to be solved.

Main issue considered and clarified: consistency with the draft Convention (including its annex)

9 It is clear that the Facility Guidelines are not stand-alone instruments such as the IMO Guidelines adopted by Assembly in 2003. The Facility Guidelines are intended to assist the implementation of chapter 3 of the draft Convention and therefore there shall be a clear linkage between the Convention and the Facility Guidelines.

10 The first issue to clarify is the relation between the Base Option and the Convention, namely, how "comprehensive plan" in the United States' proposal (= (A) Ship Recycling Facility Plan (SRFP)) and four component plans ((B), (C), (D) and (E)) "fit in" the Convention.

11 The further clarification of the two interpretations was provided by the United States as follows:

We believe there is confusion in the use of the term ship Recycling Facility Management Plan (RFMP), so we have avoided using the term above even though it is clearly called for in the Convention (Regulation 18). Some view the RFMP as a broad plan that encompassing all the four components outlined in step 1 above, and we believe the Convention can be read to support this view. With this approach, one could simply use the term RFMP in place of SRFP above. However, others see the RFMP as a description of the facility's overall "management systems" that are in place to guide the facility's operation, but it would not address health, safety, and environmental protocols in sufficient detail. With this approach, such a RFMP would essentially equate to the "General Management Plan" described above, and would need to be augmented by the three additional plans identified in order to adequately demonstrate that the facility meets the requirements of the Convention. The draft guidelines prepared by Japan follows this second view.

12 The United States' approach is that regulation 18 requires a Ship Recycling Facility (SRF) to develop a RFMP, by which a SRF can show to the Competent Authority its compliance with the requirements of the Convention. Because RFMP (=SRFP in the United States' proposal) is a comprehensive plan, the four component plans ((B) General Management Plan, (C) Operational Plan, (D) Worker Safety & Health Compliance Plan and (E) Environmental

Compliance Plan) are included in RFMP (=SRFP) and thus their development is necessary for an SRF. In other words, although the component plans (B to E) are not explicitly mentioned in the text of the Convention, they are implicit in other regulations of chapter 3. Since the development of (A) (RFMP=SRFP) is a clear requirement, the development of four component plans can be prescribed in the main part of the Facility Guidelines as the document that an SRF should show to the Competent Authority.

13 With this approach, the main part of the Facility Guidelines would include performance standards and the necessary associated documentation, rather than specifying a particular operating procedure of an SRF. Refer to the content of the Facility Guidelines provided by the United States which you can see at the end of the attached file "Facility Guidelines comments compiled", as well as the attached file "US SRFP" that was submitted to the group in the 1st round. In the narrative part of "US SRFP", you can see, for example,

> *"the [Worker Safety and Health Compliance] plan should include, but not be limited to, descriptions and procedures of the following:*
>
> *.1 Diving Operations – describe the diving programme and services to be employed, if any, during the ship recycling project*
>
> *.2 Confined and Enclosed Spaces – including procedures for identifying, entering, and working in confined spaces or spaces with dangerous atmospheres..."*

14 In this approach, the Guidelines would stipulate what each plan should include and describe, without prescribing specific methodology by an SRF such as what they should exactly do in a diving operation and in working in enclosed spaces (such prescription might be in an appendix, as the United States suggested). It was further noted that helpful technical guidance could be included in an appendix, as appropriate.

15 Another interpretation is to more narrowly treat RFMP of regulation 18, meaning that RFMP would cover the "general management" only, thus corresponding to (B), not (A), of the United States' proposal. Under such interpretation, the basic presumption by the United States that the requirement of SRFP (comprehensive, including four component plans) which comes from regulation 18 (on RFMP) could weaken, so could the linkage between the Convention and the Facility Guidelines.

16 The group considered this background information at 2nd round – 2nd step, and the group was in general agreement that:

- chapter 3 of the Convention can be interpreted to require a Ship Recycling Facility to develop a comprehensive SRFP;

- SRF is to submit a comprehensive SRFP containing four component plans to the Competent Authority to demonstrate compliance with the requirements of the Convention;

- the main part of the Facility Guidelines would be to give guidance on performance standard for facilities and what the four component plans should include and describe, avoiding prescription of ship recycling methodologies; and

- the general structure of the Facility Guidelines illustrated in figure 1 would be the Base Option of which details the group will further work on.

While the above points were generally shared by the group, the following points were made for further consideration.

Technical guidance

17 It was recognized that technical standards and guidance for ship recycling should be provided in the main part of the Facility Guidelines, as appropriate. This could be done by:

- making references from the Facility Guidelines to the requirements of the pertinent regulation(s) of the Convention;

- detailing such technical guidance or appropriate standards inside the Facility Guidelines as it has been done to some extent in the Base Option (see annex 1); and

- specifying such technical guidance or appropriate standards and embed them in the Facility Guidelines (within the structure of Base Option) in the way as proposed before (see annex 2). This could also be done by putting technical guidance in the appendices of the Facility Guidelines.

18 Among the further technical guidance that may be necessary, in particular, gas-free/safe for hot work, should be provided as this is an important area that must be fully addressed. Technical guidance is included in the original proposal (such as those included in annex 2). One member of the group indicated their interest in furthering future discussion by preparing a draft guideline document specifically targeted for gas-free/safe for hot works. There was a view that such specific guidance could be in one of appendices to the Facility Guidelines.

Fine-tuning between the Convention and the Facility Guidelines

19 While it is recognized that the development of (A) SRFP (=RFMP using the Convention terminology) is a clear requirement and that the development of four component plans are implicit or implied in the regulations, a member was of the view that there should be some clarification to be made in the Convention to explicitly mention four component plans and change the name of RFMP to SRFP. The member commented that the group could submit a proposal to the diplomatic Conference to amend regulation 18 as follows. However, it is clear that the group is not in a position to make a submission to the diplomatic Conference. Members may wish to consider such action in view of the discussion as summarized above.

Regulation 18 – Ship Recycling Facility ~~Management~~ Plan

1 Ship Recycling Facilities authorized by a Party shall prepare a Ship Recycling Facility ~~Management~~ Plan. The Plan shall be adopted by the board or the appropriate governing body of the Recycling Company, and shall include:

.....(text unchanged within present regulation 18.1 to 18.9)

2 The Ship Recycling Facility Plan will include a General Management Plan, an Operational Plan, Worker Safety and Health Plan, and Environmental Compliance Plan.

taking into account guidelines developed by the Organization.

20 A concern was expressed, in the context of the harmonization of the Convention and the Facility Guidelines, that the introduction of four new "plans" could be seen as yet a new bureaucratic burden to the facilities. In this member's view, the "plans" (component plans in Base Option) would merely be the headings of sections on these issues in the guideline; whether an Administration will in fact require such plans as stand-alone items are up to the Party to decide. This member further argued that a reference to "Plan(s)" should be made only to those mentioned in the Convention, seeing the need to include the defined plans possibly as their own sub-heading or annex.

Consideration of an alternative formulation of the management plan

21 Some group members asked for consideration of an alternative structure proposed by Germany, as well as the base option, which is summarized as follows.

Germany commented:

> *"It is most common in the world to implement a management system according to standards like ISO 9001, ISO 14001, OHSAS 18001 and more of them. Most of these standards have a similar structure. We propose to follow the general structure of the ISO 14001. Then we have additional requirements related to the general chapters of the ISO 14001. If necessary it might be useful to have a cross reference table.*
>
> *1. Scope*
> *2. Normative references...*
> *3. Terms and definitions...*
> *4. Environmental Health and Safety management system requirements.*
> *4.1 General requirements*
> *4.2 Environmental policy.*
> *4.3 Planning*
> *4.3.1 Environmental, Health and Safety aspects*
> *4.3.2 Legal and other requirements.*
> *4.3.3 Objectives, targets and programme(s) .*
> *4.4 Implementation and operation.*
> *4.4.1 Resources, roles, responsibility and authority..*
> *4.4.2 Competence, training and awareness*
> *4.4.3 Communication*
> *4.4.4 Documentation*
> *4.4.5 Control of documents*
> *4.4.6 Operational control*
> *4.4.7 Emergency preparedness and response.*
> *4.5 Checking*
> *4.5.1 Monitoring and measurement*
> *4.5.2 Evaluation of compliance.*
> *4.5.3 Nonconformity, corrective action and preventive action .*
> *4.5.4 Control of records*
> *4.5.5 Internal audit.*
> *4.6 Management review*
> *Annexes"*

22 In considering the above, it was noted that the German proposal could be regarding the (B) Management Plan of the Base Option, not the one which intends to replace the whole set of the comprehensive plans of the Base Option, because:

- Germany used the term, in the main part of the skeleton, "environmental health and safety *management system requirements*"; and

- Germany also clarified that the proposal *"followed the general structure of the ISO 14001"*, which is the management system.

23 It was further noted, based on the past discussion at MEPC at this group and the present structure of chapter 3 of the Convention, that the Facility Guidelines together with relevant regulations of chapter 3 go beyond "management system" similar to the ISO 14000 series, although the management part of the Facility Guidelines can draw upon the experiences of those existing management systems.

24 Generally, the group felt that the German proposal was related to the Management Plan part of the Base Option. In this context, it was noted by some group members that India pointed out in MEPC 58 that the ISO scheme is "business to business" but not "government to business" as mandated by the Convention (paragraph 3.12 of MEPC 58/23), which was also shared by some group members. The new framework, not necessarily those following the existing management system, would be the best approach for the guidelines tailored to the ship recycling Convention.

Situations involving more than one Ship Recycling Facilities

25 This issue has been raised several times that, while the Convention is written in a way to accommodate a situation where more than one Ship Recycling Facilities are used, the draft Facility Guidelines is not written in that way. The group was of the view that this issue can be revisited after there is an agreement on the general structure and approach of the Facility Guidelines.

Relation between the plans developed under Facility Guidelines and SRP

26 The group shared the analysis that *"RFMP is the document which the Competent Authority of the recycling State will approve to verify the facility's compliance with the Convention requirements. As such it will provide detail of the facility's capacity; it will be the document that informs the Ship Recycling Plan which in turn will apply the ship specific details to those defined operations."*.

27 As pointed by some members, there is interconnectedness between the facility-related plans (RFMP (= SRFP) and its component plans) and SRP. The United States provided, in relation to their previous submission (MEPC 56/3/6), the following idea and explanation on what SRP would be under the Base Option:

> In cases where the RFMP/SRFP and the DASR comprehensively address all necessary aspects of recycling that would apply to a specific ship, then the SRP for that ship may simply contain the ship particulars and planned schedule of recycling operation. In such a case, the member asserts that the SRP may be very concise (i.e. a "one page" document) since it relies on the RRMP/SRFP and DASR for detailed operational specifics to ensure environmentally sound recycling in accordance with the Convention. This could avoid needless duplicative documentation regarding how the ship will be recycled.

A member further argued that the same guidelines can address both facility-related plans and SRP in different chapters, for user-friendliness.

28 At this stage, the group was of the view that the discussion should concentrate on the formulation of the RFMP (=SRFP) and its component plans. The work on SRP Guidelines is out of the mandate of the group, however, the group felt that it can provide "insights" on the SRP, as an implication of the facility-related plans to be provided in the Facility Guidelines. In this connection, it was commented by a member that:

> *"We would like to call the attention of the members of the group on point 2.2. ("Safe and Environmentally sound Management of Hazardous Materials) supplement of the Document of Authorization to conduct Ship Recycling (DASR) in Appendix 5 of the Convention.*
>
> *It is stated that if the hazardous materials are not processed in the recycling facility, the ship recycling facility will have to describe where the hazardous materials are to be processed/disposed in the Ship Recycling Plan (see footnote 3).*
>
> *We therefore foresee that in the majority of the cases, the Ship Recycling Plan will be more developed than a one-page document like the one proposed in page 15 of submission MEPC 56/3/6.*
>
> *Our understanding is that the Ship Recycling Plan will not only be useful for the Competent Authority(ies) of the recycling country, but also for the Administration of the flag States in particular before issuing the International Ready for Recycling Certificate. We are uncertain at this stage of whether or not the US proposal is to have a one-page document and, attached the RFMP (=SRFP), or just a one-page document. We believe it is important for the flag State to be able to verify, during the final survey and based on the inventory of hazardous materials, if all the hazardous materials that are on board the ship are effectively covered in the RFMP (=SRFP)."*

29 Another member also commented as follows:

> *However, we should not get to a conclusion as suggested by the US (NOTE: it means the previous US proposal) that an SRP could end up with a simple document addressing only ship specific details. US is used to dismantle mainly its own ships (Administration and the Competent Authority are from the same State). It is not such a common situation and within the convention, we will need a "detailed" SRP or regulation 10.1.4 will be useless.*

30 Another member was of the understanding that Ship Recycling Facilities would develop ship specific SRPs, but obviously from an extensive template (facility-specific information which can be used as a kind of "standard template") which will allow for easy development of ship specific plans with only a few changes.

31 As can be seen from the argument above, there still remain different images of the SRP. As the group and the Committee progress with the structure and details of the Guidelines, it is expected that clearer images on SRP would be shared by members, and the group/Committee may be in a position to provide insights on SRP Guidelines (which could be merged to Facility Guidelines, as one possibility).

Redrafting of the guidelines' structure and step-by-step practical formulation

32 It was advocated by a member and shared by some that the guidelines' structure should move more towards step-by-step practical formulation. While it is recognized that it may be

difficult to apply step-by-step approaches for the whole Facility Guidelines (SRFP and four component plans), the Operational Plan, as one of sub-plans, could be a very good fit to applying step-by-step formulation. The Base Option and its narratives on component plans (annex 2) has already used such formulation to a large extent.

Others

33 Concern has been raised that there have been little contributions from the current major ship recycling countries. This concern seems valid as it is in these countries that the Facility Guidelines will be heavily used. It should be noted that so far the group has only discussed the general structure of the Facility Guidelines; there should be an ample opportunity for countries with recycling interests to make comments and to contribute to the discussion at a later stage when the Committee/group (if re-established) discusses the details of the Facility Guidelines.

Conclusion and way forward

34 In summary, the group was able to agree on the general structure of the Facility Guidelines as shown in figure 1 of this document, but was unable to finalize the full content of the Facility Guidelines. Therefore, the Committee is requested to re-establish the group in order to continue its work on the details of the Facility Guidelines, with a view to finalizing it by MEPC 60. In this process, the countries with ship recycling interests would be strongly encouraged to actively participate in the discussions of the group.

Action requested of the Committee

35 The Committee is invited to consider this report and to take action as appropriate.

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ANNEX 1

BRIEF SUMMARY OF THE DRAFT SHIP RECYCLING PLAN (SRFP) PROPOSED BY THE UNITED STATES

This annex provides guidance for the preparation of a suitable Ship Recycling Facility Plan (SRFP), as required by the International Convention for Safe and Environmentally Sound Recycling of Ships (hereinafter referred to as the Convention). Ship recycling facilities may use these guidelines in order to develop a comprehensive facility-wide plan to ensure that the recycling operation will comply with the Convention. The SRFP should demonstrate comprehensive 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 Plan should also describe the operational processes and procedures involved in ship recycling at the facility, demonstrating how the requirements of the Convention will be met. Based on this Plan, as well as site inspections to verify that the facility operation comports with the description, the Competent Authority will take action to either issue or deny the facility a Document of Authorization for Ship Recycling Facility (DASR) to allow the facility to recycle ships subject to the Convention.

General Management Plan

A comprehensive RFMP, providing an overview of the ship recycling, should assist the ship recycling facility in meeting the requirements of the Convention.

The RFMP should provide information regarding the organizational structure and management policies of the company, an overview of the facility, and the dismantling methodologies related to ship recycling. The RFMP should provide sufficient detail that demonstrates a thorough understanding of production processes, and project management associated with the dismantlement of a ship and should demonstrate that the ship recycling facility uses a valid and practical solution to the technical problems inherent in ship dismantling.

The RFMP should anticipate variances to dismantling operational processes due to the discovery of previously unknown factors or items during vessel dismantlement. There should be standard procedures for identifying the unknown feature and a decision making process that leads to an approach that will be protective of worker safety and the environment.

Operational Plan

The Operational Plan should include a narrative that demonstrates a thorough understanding of regulations, production processes, project management, requirements to perform dismantling in accordance with applicable laws and regulations, and the demonstration of the complete understanding of the true scope of potential problems and risks in ship dismantling.

Worker Safety and Health Compliance Plan

The Worker Safety and Health section of the RFMP should provide a concise description of the recycling facility's plan and procedures for protecting worker health and safety and should reflect applicable requirements of the Convention (particularly regulation 23) and national legislation. This should demonstrate that the safety and health programme supports the level of effort, environmental compliance, and recycling and disposal procedures required for the project.

Environment Compliance Plan

The Environmental Compliance section of the RFMP should provide a concise description of the recycling facility's plan and procedures for protection of the environment, how hazardous materials are properly managed, and the procedures for response in the event of a threat to the environment; and should reflect applicable requirements of the Convention (particularly regulations 20-22) and national legislation.

Details of SRFP, provided by the United States

SHIP RECYCLING FACILITY PLAN

This annex provides guidance for the preparation of a suitable Ship Recycling Facility Plan (SRFP), as required by the International Convention for Safe and Environmentally Sound Recycling of Ships (hereinafter referred to as the Convention). Ship recycling facilities may use these guidelines in order to develop a comprehensive facility-wide plan to ensure that the recycling operation will comply with the Convention. The SRFP should demonstrate comprehensive 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 Plan should also describe the operational processes and procedures involved in ship recycling at the facility, demonstrating how the requirements of the Convention will be met. Based on this Plan, as well as site inspections to verify that the facility operation comports with the description, the Competent Authority will take action to either issue or deny the facility a Document of Authorization for Ship Recycling Facility (DASR) to allow the facility to recycle ships subject to the Convention.

The guidance below is presented in two sections:

- An outline of topics that should be addressed in the Ship Recycling Facility Plan
- A narrative description of key elements to be included in the plan

Note that not every item in the outline is addressed in additional detail in the narrative guidance.

SHIP RECYCLING FACILITY PLAN OUTLINE

1.0 MANAGEMENT PLAN

1.1 Company Information
- 1.1.1 Organizational Structure
- 1.1.2 Key Personnel
- 1.1.3 ESH Management Programme and Policy Statement

1.2 Workforce and Training Programme

1.3 Personnel and Subcontractor Management

1.4 Records Management

1.5 Past Performance

2.0 OPERATIONAL PLAN

- 2.1 Facility Information
  - 2.1.1 Layout of the Facility
  - 2.1.2 Infrastructure
  - 2.1.3 Equipment
  - 2.1.4 Permits, Licences, Certifications
  - 2.1.5 Dismantling Operations, Capability and Approach
  - 2.1.6 Security Measures
- 2.2 Vessel Pre-Arrival Management
  - 2.2.1 Ship Recycling Plan (SPR) Development
  - 2.2.2 Notification of Intent to Accept a Ship
  - 2.2.3 Towing Operations
  - 2.2.4 Vessel Afloat Monitoring Procedures
- 2.3 Vessel Arrival Management
  - 2.3.1 Mooring
  - 2.3.2 Stability and Flood Prevention
  - 2.3.3 Security Measures
  - 2.3.4 Severe Weather Measures
- 2.4 Ship Dismantling Methodology
  - 2.4.1 Initial Survey and Evaluation
  - 2.4.2 Stability and Afloat Monitoring Procedures
  - 2.4.3 Cutting Operations and Gas-Free for Hot Works Procedures
  - 2.4.4 Production Flow and Segregation of Materials
  - 2.4.5 Final Hull Dismantling
  - 2.4.6 Reporting at Completion of Ship Recycling

3.0 WORKER SAFETY AND HEALTH COMPLIANCE PLAN

- 3.1 Regulatory Framework and Compliance Procedures
  - 3.1.1 Statement of Determination
  - 3.1.2 Key Safety and Health Personnel
  - 3.1.3 Job Hazard Assessment
  - 3.1.4 Safety and Health Training
  - 3.1.5 Personnel and Subcontractor Management
  - 3.1.6 Incident/Accident Reporting Procedures
  - 3.1.7 Substance Abuse Policies
- 3.2 Operations and Processes
  - 3.2.1 Diving Operations
  - 3.2.2 Confined and Enclosed Spaces
  - 3.2.3 Welding, Cutting, Grinding, and Heating
    - 3.2.3.1 Gas-Free for Hot Works Programme
  - 3.2.4 Drums, Containers, and Pressure Vessels
  - 3.2.5 Scaffolds, Ladders, Workman Aloft, Other Working Surfaces
    - 3.2.5.1 Fall Protection Programme
  - 3.2.6 Gear and Equipment for Rigging and Material Handling
  - 3.2.7 Housekeeping and Illumination

3.2.8 Tool and Equipment Maintenance and Decontamination
3.2.8.1 Lock Out/Tag Out Programme
3.2.9 Health and Sanitation
3.2.10 Communication of Hazards
3.2.10.1 Signage
3.2.11 Personal Protective Equipment
3.2.11.1 Respiratory Protection Programme
3.2.11.2 Hearing Conservation Programme
3.2.12 Emergency Preparedness and Response
3.2.13 Fire Prevention and Protection
3.2.14 Worker Exposure and Medical Monitoring
3.2.14.1 Asbestos Programme
3.2.14.2 Lead and Other Heavy Metals Programme
3.2.14.3 Blood Borne Pathogens

3.3 Prevention of Accidents
3.3.1 Gas-Free for Hot Works
3.3.2 Safe Entry Procedures
3.3.3 Accident Prevention Procedures
3.3.4 Pollution Prevention Procedures

3.4 Emergency Preparedness and Response Plan

3.5 Fire Prevention and Response Plan

4.0 ENVIRONMENTAL COMPLIANCE PLAN

4.1 Regulatory Framework and Compliance Procedures
4.1.1 National and International Requirements
4.1.2 Permits, Licences, Certifications
4.1.3 Environmental Monitoring
4.1.4 Incident and Spills Reporting Procedures
4.1.5 Notification

4.2 Hazardous Materials Management
4.2.1 Asbestos
4.2.1.1 Identification and Integration with dismantling
4.2.1.2 Potential Onboard locations
4.2.1.3 Sampling and Analysis, protocols and test methods
4.2.1.4 Handling, Removal, Remediation
4.2.1.5 Storage and Labelling
4.2.1.6 Treatment, Transportation, Disposal
4.2.2 PCBs
4.2.2.1 Identification and Integration with dismantling
4.2.2.2 Potential Onboard locations
4.2.2.3 Sampling and Analysis, protocols and test methods
4.2.2.4 Handling, Removal, Remediation
4.2.2.5 Storage and Labelling
4.2.2.6 Treatment, Transportation, Disposal
4.2.3 Fuels and Oils
4.2.3.1 Identification and Integration with dismantling

4.2.3.2 Potential Onboard locations
4.2.3.3 Sampling and Analysis, protocols and test methods
4.2.3.4 Handling, Removal, Remediation
4.2.3.5 Storage and Labelling
4.2.3.6 Treatment, Transportation, Disposal

4.2.4 Bilge/Ballast Water
4.2.4.1 Identification and Integration with dismantling
4.2.4.2 Potential Onboard locations
4.2.4.3 Sampling and Analysis, protocols and test methods
4.2.4.4 Handling, Removal, Remediation
4.2.4.5 Storage and Labelling
4.2.4.6 Treatment, Transportation, Disposal

4.2.5 Heavy Metals
4.2.5.1 Identification and Integration with dismantling
4.2.5.2 Potential Onboard locations
4.2.5.3 Sampling and Analysis, protocols and test methods
4.2.5.4 Handling, Removal, Remediation
4.2.5.5 Storage and Labelling
4.2.5.6 Treatment, Transportation, Disposal

4.2.6 Paints and Coatings
4.2.6.1 Identification and Integration with dismantling
4.2.6.2 Potential Onboard locations
4.2.6.3 Sampling and Analysis, protocols and test methods
4.2.6.4 Handling, Removal, Remediation
4.2.6.5 Storage and Labelling
4.2.6.6 Treatment, Transportation, Disposal

4.2.7 Waste Water/Sludge
4.2.7.1 Identification and Integration with dismantling
4.2.7.2 Potential Onboard locations
4.2.7.3 Sampling and Analysis, protocols and test methods
4.2.7.4 Handling, Removal, Remediation
4.2.7.5 Storage and Labelling
4.2.7.6 Treatment, Transportation, Disposal

4.2.8 Ozone Depleting Substances
4.2.8.1 Identification and Integration with dismantling
4.2.8.2 Potential Onboard locations
4.2.8.3 Sampling and Analysis, protocols and test methods
4.2.8.4 Handling, Removal, Remediation
4.2.8.5 Storage and Labelling
4.2.8.6 Treatment, Transportation, Disposal

4.2.9 Other Materials
4.2.9.1 Identification and Integration with dismantling
4.2.9.2 Potential Onboard locations
4.2.9.3 Sampling and Analysis, protocols and test methods
4.2.9.4 Handling, Removal, Remediation
4.2.9.5 Storage and Labelling
4.2.9.6 Treatment, Transportation, Disposal

4.3 Spill Prevention, Control, and Countermeasures Plan

4.4 Storm Water Pollution Prevention Plan

SHIP RECYCLING FACILITY PLAN
Narrative description of key elements to be included in the Plan

1.0 RECYCLING FACILITY MANAGEMENT PLAN DEVELOPMENT

A comprehensive RFMP, providing an overview of the ship recycling, should assist the ship recycling facility in meeting the requirements of the Convention.

The RFMP should provide information regarding the organizational structure and management policies of the company, an overview of the facility, and the dismantling methodologies related to ship recycling. The RFMP should provide sufficient detail that demonstrates a thorough understanding of production processes, and project management associated with the dismantlement of a ship and should demonstrate that the ship recycling facility uses a valid and practical solution to the technical problems inherent in ship dismantling.

The RFMP should anticipate variances to dismantling operational processes due to the discovery of previously unknown factors or items during vessel dismantlement. There should be standard procedures for identifying the unknown feature and a decision-making process that leads to an approach that will be protective of worker safety and the environment:

Company Information

.1 Organization and management structure;

.2 key personnel – names, roles, and responsibilities (at a minimum the facility should have a dedicated environmental, safety, and health manager);

.3 requisite and relevant experience relating to ship dismantlement;

.4 policy statement on environmental, safety, and health commitment;

.5 description of the facility's environmental, safety, and health management programme, including Environmental Management System certifications (e.g., ISO); and

.6 history of operations – including length of time in business; regulatory citations, violations, or fines, and other criminal or administrative penalties or actions related to environmental, safety, and health.

Employee Training

Regulation 22 of the Convention specifies that the ship recycling facility must establish training programmes that:

.1 cover all workers and members of the ship recycling facility and ensures that workers and members of the ship recycling facility attend the training;

.2 be conducted by competent persons, who have identified specific training needs for individual workers by conducting a job hazard assessment, developed goals and objectives for the training, and reviewed and implemented improvements in the training programme, as needed;

.3 provide for initial and refresher training at appropriate intervals;

.4 is presented in a manner that can be perceived and understood by all workers;

.5 include participants' evaluation of their comprehension and retention of the training;

.6 be reviewed periodically, and modified as necessary to include an evaluation of changing work conditions and potential new hazards; and

.7 be documented.

The programme should include the appropriate training for job tasks and operations performed by the employee including, but not limited to, hazardous materials communication, awareness, and handling; job hazard awareness; confined and enclosed space entry and work; personal protective equipment care, maintenance, limitations of, useful life, and disposal; first aid; fire protection and prevention; emergency response and evacuation; operation of tools, heavy machinery, and mechanical equipment; and fall protection.

Records Management

.1 Company policies and procedures for retaining vital records associated with the dismantlement of the ship – including laboratory analytical results, manifests, shipping documents, truck receipts, waste shipment records, worker accidents and injuries, and a description of any regulatory requirements for records management and retention.

2.0 OPERATIONAL PLAN

The Operational Plan should include a narrative that demonstrates a thorough understanding of regulations, production processes, project management, requirements to perform dismantling in accordance with applicable laws and regulations, and the demonstration of the complete understanding of the true scope of potential problems and risks in ship dismantling.

Facility Information

.1 Physical location – including acreage and facility access routes;

.2 facility description – including facility layout, water depth, accessibility, maintenance and dredging, and a drawing or map;

.3 dismantling area description – including all slip, pier, drydock, or other areas at the facility where dismantling will occur;

.4 dismantling capacity – including number of slips, piers, drydocks, or other, equipment capabilities, and total estimated ship capacity;

.5 production throughput/capacity – including steel, hazardous materials, and recyclables, procedures for material segregation, and processing flow charts;

.6 site-specific permits – in effect or obtained prior to the start of ship dismantling, including any lease or authorization from a land owner, port, or other entity granting authorization to use the facility for ship recycling purposes;

.7 confirmation that the facility is operated and maintained in a manner that complies with all international laws, treaties, conventions and agreements, and other Federal, State, and local statutes, as applicable;

.8 subcontracted operations – including specific information on subcontractor responsibilities, teaming and subcontractor relations, subcontractor qualifications and personnel, training and monitoring responsibilities, and approval of subcontractor work plans;

.9 certification and/or verification that all subcontractors (including handlers, transporters, treatment, storage, disposal) hold valid permits, registrations, and/or certificates, as applicable; and

.10 security systems and procedures.

Vessel Pre-Arrival Information

.1 Development of a Ship Recycling Plan (SRP) in accordance with regulation 9 of the Convention, which specifies that a SRP must be developed by the recycling facility before any recycling of a ship can take place, and that it shall:

.1 be developed in consultation with the shipowner;

.2 be developed in the language accepted by the Party authorizing the ship recycling facility, and if the language used is neither English, French nor Spanish, the SRP shall be translated into one of these languages;

.3 be available for inspection by officers of the Administration responsible for surveying the ship, or the entrusted surveyors, or to organizations recognized by the Administration; and

.4 include information concerning, *inter alia,* prior material removal where required in accordance with the capability of the recycling facility to manage the type or amount of materials.

Since the vast majority of operational processes involved in ship dismantling are expected to be similar for each ship, a significant portion of the processes that are specified in the Recycling Facility Management Plan can be used to prepare the Ship Recycling Plan. Therefore, the SRP could be a straightforward document identifying the ship to be dismantled, the recycling facility, reference to the facility's management plan, and identify any ship-specific considerations not

addressed by the recycling facility management plan or that will require special procedures.

Similar to the RFMP, the SRP should anticipate variances to dismantling operational processes due to the discovery of previously unknown factors or items during vessel dismantlement. There should be standard procedures for identifying the unknown feature and a decision-making process that leads to an approach that will be protective of worker safety and the environment.

Preparation of the SRP should begin well before the ship arrives at the recycling facility. The Convention requires that the SRP is in place prior to the issuance of an International Ready for Recycling Certificate. The SRP should be signed by both the recycling facility and the shipowner.

.2 Survey and/or sampling for hazardous materials – including gathering all existing information to aid in the completion of the survey and sampling for hazardous materials; further, the ship recycling facility may wish to conduct a full or partial survey and/or collect samples before arrival of the ship to the facility.

.3 Pre-cleaning – including the removal of stores and consumables, and/or hazardous materials.

.4 Process of getting ship to facility.

.5 Towed ships (if the facility accepts vessels that don't arrive under their own power) – including tow and stability preparation measures; tow routes; liquid load plan; emergency and oil spill response plans for all phases of the tow; required documents and/or plans for the tow; International Loadline Exemption Certificate; verification that methods are in accordance with accepted marine practice; certification of "safe entry" for spaces requiring access during journey; verification of regulatory compliance, permits, notifications, plans, and/or procedures have been met (including any entity having jurisdiction during towing sequence); and for vessels being towed internationally, where the towed vessel has an operationally functioning propulsion system, verification of compliance with International Safety Management (ISM) Code.

Vessel Arrival Information

.1 Securing vessel – including mooring, heavy and/or severe weather contingencies, afloat monitoring, stability during dismantling, and flooding and/or sinking prevention methods.

.2 Survey and sampling – including hazardous materials, tank soundings, documentation of unknowns, safe and unsafe areas, gas-free certification, and verification by company that survey and sampling will be completed prior to the start of work.

Dismantling Methodology

.1 Approach to ship dismantling –including the entire process of dismantling a vessel, including the integration of hazardous material and waste remediation with the vessel superstructure and hull dismantlement, and a description of the methodology and procedures for identifying and segregating all material.

.2 Engineering, technical, production, and management processes – including methodologies for the ship and in the yard (this section should include detailed descriptions of, at a minimum, the following processes: gasket removal; cable stripping for metal recovery; paint removal operations; recycling of salvageable materials; marine chemist gas-free certificate for hot work areas; hose rigging (fire, power, gas, and water); trash, stores, and consumables removal; fire watch; floating pans; pre-cuts of steel, and section removal).

3.0 WORKER SAFETY AND HEALTH COMPLIANCE PLAN

The Worker Safety and Health section of the RFMP should provide a concise description of the recycling facility's plan and procedures for protecting worker health and safety and should reflect applicable requirements of the Convention (particularly regulation 23) and national legislation. This should demonstrate that the safety and health programme supports the level of effort, environmental compliance, and recycling and disposal procedures required for the project.

Operations and Processes

The Plan should include, but not be limited to, descriptions and procedures of the following:

.1 Diving Operations – describe the diving programme and services to be employed, if any, during the ship recycling project;

.2 Confined and Enclosed Spaces – including procedures for identifying, entering, and working in confined spaces or spaces with dangerous atmospheres;

.3 Welding, Cutting, Grinding, and Heating – including procedures for ventilation, personnel monitoring for heavy metals exposure, protection of personnel, training, respiratory protection, torch cutting, permits and inspections (including hotwork certification);

.4 Drums, Containers, and Pressure Vessels – including procedures for transporting, moving, securing, and storing, and the use of hoses and torches on or near the vicinity of;

.5 Scaffolds, Ladders, Workman Aloft, Other Working Surfaces – including use of personnel flotation devices, guarding of deck openings and deck edges, platforms, personal fall arrest systems, guard rails, and access to ships;

.6 Gear and Equipment for Rigging and Material Handling – including procedures for testing and inspections of ropes, chains, slings, and hooks, chain-falls, and hoisting and hauling equipment; and a description of crane, machine, mobile

equipment, aerial- and man-lift operations and qualifications required of operators;

.7 Housekeeping and Illumination – including procedures for work areas, such as aisles, passageways, and temporary flooring openings;

.8 Tool and Equipment Maintenance and Decontamination – including procedures for equipment inspection and maintenance, regulatory requirements for third-party inspections, and decontamination procedures and activities;

.9 Health and Sanitation – including a description of washing facilities, showers, eating and recreation areas to be used, toilet facilities, and change rooms;

.10 Communication of Hazards – including procedures for providing information to employees on potential hazards associated with the job;

.11 Personal Protective Equipment – including information on procedures and equipment used for the protection of employees from various risks associated with ship recycling (to include a job hazard analysis to determine the required personal protective equipment; respiratory protective equipment; personal protective clothing; and a hearing conservation programme);

.12 Emergency Preparedness and Response – including information on emergency escape routes, procedures to account for employees during evacuations, alarm systems, weather plans, rescue and medical duties, first aid and treatment of injured personnel, and training procedures;

.13 Fire Prevention and Protection – including procedures for fire watch, raising alarm, fire hazards, fire extinguishers, hose lines, water supply, fire-fighting equipment, training, proper handling and storage procedures, and identification of potential ignition sources; and

.14 Worker Exposure and Medical Monitoring – including procedures to be used for job hazard analysis, medical surveillance, exposure monitoring, and training.

Worker Safety Provisions

The Plan shall describe how the facility will provide for worker safety by:

.1 conducting a job hazard assessment to determine the proper approach to maximize worker safety;

.2 ensuring the availability, maintenance, and use of personal protective equipement and clothing needed for all ship recycling operations;

.3 provide for training programmes enabling workers to safely undertake all operations the worker is tasked to do;

.4 ensuring that any worker at the facility has been provided with appropriate training prior to performing any ship recycling operation;

.5 ensuring that unsafe areas are posted with warning signs and labels in a language that all workers understand, and that all previously designated unsafe areas shall be appropriately tested and/or verified as safe for workers prior to performing any ship recycling operation in that area;

.6 ensuring that the ship recycling facility will maintain safe conditions, and that safety deficiencies will be frequently evaluated for the need for corrective actions; and

.7 designating one or more competent persons; a competent person has the appropriate training, knowledge, licence, and/or certification to be capable of recognizing and evaluating employee exposure to hazardous substances or to other unsafe conditions and is capable of specifying the necessary protection and precautions to be taken to ensure worker safety.

Prevention of Accidents

Regulation 19 of the Convention specifies that the ship recycling facility establish and utilize procedures to:

.1 prevent explosions by establishing procedures for ensuring gas-free-for-hot-work conditions throughout the ship recycling process;

.2 prevent other accidents causing, or with the potential to cause, damage to human health; and

.3 prevent spills of cargo residues and other materials on the ships which may cause harm to human health and/or the environment.

Emergency Preparedness and Response

Regulation 21 of the Convention specifies that ship recycling facilities shall establish and maintain an Emergency Preparedness and Response Plan. The plan shall be made having regard to the location and environment of the ship recycling facility, and take into account the size and nature of activities associated with each ship recycling operation. The plan shall:

.1 ensure that the necessary equipment and procedures to be followed in the case of an emergency are in place, and that drills are being held on a regular basis;

.2 ensure that the necessary information, internal communication and coordination are provided to protect all people in the event of an emergency at the facility;

.3 provide information to, and communication with, the relevant Competent Authority(ies), the surrounding community, and emergency response services;

.4 provide for first-aid and medical assistance, fire fighting, evacuation of all people at the facility, and pollution prevention measures; and

.5 provide for relevant information and training to all workers of the ship recycling facility, at all levels and according to their competence, including regular exercises in emergency prevention, preparedness, and response procedures.

The plan should be a self-contained document for ease of use and distribution of copies throughout the facility.

Fire Prevention and Fire Fighting

The ship recycling facility should have a system for fire prevention and fire fighting to avoid the risk of fire, control any outbreak of fire quickly and efficiently, and to bring about a quick and safe evacuation of all personnel at the facility. This should include:

.1 sufficient and secure storage areas for flammable liquids, solids, and gases;

.2 the prohibition of smoking through "no smoking" notices;

.3 precautions in confined spaces and other places which flammable gases, vapours, or dusts can cause danger (no naked light or flame or hot work should be permitted unless it has been made completely free of the flammable atmosphere, tested and found safe by a competent person);

.4 the proper storage of combustible materials, greasy or oily waste, and scrap wood or plastics;

.5 regular inspections of places where there are fire risks. This includes the vicinity of heating appliances, electrical installations conductors, stores of flammable and combustible materials, and hot welding and cutting operations;

.6 precautions to reduce the risk of fire and explosions from welding, flame cutting, and other hot work;

.7 the provision of suitable and sufficient fire-extinguishing equipment in a readily available, easily visible, and accessible area; and an adequate water supply in places where the danger of fire exists (in accordance with national laws and regulations);

.8 the provision and selection of fire-extinguishing equipment according to the provisions of international and national laws and regulations and the results of the initial hazard identification, risk, and assessment of the ship recycling facility operations. Equipment deployed should be suitable for and consistent with the following demands and applications: the restricted access, egress, and confined spaces inside the ship; the quantity and characteristics of hazardous, flammable, and explosive substances handled in ship dismantlement operations; site transport and storage facilities; and first-stage fire-fighting purposes (such as hand-held or trolley-mounted portable fire-fighting extinguishers);

.9 the provision for the 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;

.10 suitable training, instruction, and information should be given to all supervisors and a sufficient number of workers about the hazards of fires, the appropriate precautions to be taken and the use of fire-extinguishing equipment, so that adequate trained personnel is readily available during all working periods;

.11 sufficient, suitable, and effective means (such as sight and sound signals) to give warning in case of fire should be installed. There should be an effective evacuation plan so that all persons are evacuated speedily without panic; and

.12 the posting of 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.

4.0 ENVIRONMENTAL COMPLIANCE PLAN

The Environmental Compliance section of the RFMP should provide a concise description of the recycling facility's plan and procedures for protection of the environment, how hazardous materials are properly managed, and the procedures for response in the event of a threat to the environment; and should reflect applicable requirements of the Convention (particularly regulations 20-22) and national legislation.

Environmental Compliance Provisions

The Environmental Compliance section of the RFMP should demonstrate that the ship recycling facility:

.1 understands the environmental risks associated with ship recycling;

.2 understands and implements the environmental requirements imposed by national and international laws and regulations;

.3 can manage and dispose of all the materials used in the structure of the ship, its equipment and/or on board the ship in an environmentally sound manner; and

.4 implements controls to protect the environment, which include handling and disposing of the hazardous materials.

The Environmental Compliance section should identify all authorizations, permits, certificates, approvals, and licences required by international, national and local environmental agencies and issued to the recycling facility to carry out the work, including those required for the management of hazardous materials.

Hazardous Materials Management

The Environmental Compliance section should describe procedures for managing potentially hazardous materials.

.1 identify possible locations of all hazardous materials;

.2 describe process control procedures and abatement methodologies;

.3 describe procedures for the removal, labelling, storage, segregation, transport, treatment, and disposal of all hazardous materials; and the interface of hazardous materials removal with ship dismantling activities;

.4 describe procedures for the off-loading of fuels and other liquids; and

.5 describe procedures for clean water discharges.

Sampling Methodologies

The recycling facility should have a documented sampling plan and methodology (including presumption) for determination of the presence of hazardous materials. The waste streams of concern include, but are not limited to:

.1 fuel, lubricants, and coolants; chemicals in drums, buckets, pressurized bottles, stored solvents, and other chemicals stocks, etc.;

.2 cargo residue;

.3 floatable materials (e.g., plastics, Styrofoam insulation wood);

.4 materials possibly containing PCBs (includes transformers, capacitors, electrical cable insulation, felt and rubber gaskets, thermal and acoustic insulation materials, adhesives, paint, caulking, grouting, various rubber and plastic products);

.5 waste water/sludges (generated aboard the vessel during the scrapping process from rain water intrusion, fire fighting, asbestos control activity, etc., as well as water that may be in compartments of the vessel at the time of arrival); human waste in the form of sewage or grey water; residues of ballast water;

.6 asbestos used in older ships as insulation material and in accommodation panelling (includes bulkhead and pipe insulation; bulkhead fire shields; electrical cable materials; brake linings; floor tiles and deck underlay; steam, water and vent flange gaskets; flexitalic gaskets; garlock seals; packing material; pipe hanger inserts; and weld shop protectors and turn covers);

.7 chromium (ballast water treatment, paint coatings, gaskets, etc.); and

.8 TBT paints.

Environmentally Sound Management

The RFMP should demonstrate how the facility will ensure safe and environmentally sound management of all hazardous materials and wastes removed from a ship recycled at the facility:

.1 identify all waste management and disposal sites, and describe how materials to be disposed will be labelled to provide for the safe and environmentally sound handling of these materials and how they will be tracked to their final destination;

.2 describe how all wastes generated from the recycling activity will be kept separate from recyclable materials and equipment, stored in appropriate conditions and only transferred to a waste management facility authorized to deal with their proper treatment and disposal; and

.3 describe how the facility will avoid waste being mixed in a way that interferes with subsequent handling, storage, treatment, or disposal.

The RFMP should identify all entities to be involved with the Environmental Compliance process, including subcontractors involved with recycling operations at the site, and those who test, transport, and provide the ultimate disposal location and methodologies. Verification of licences, approvals, permits, and insurance of the subcontractors should be included. Procedures for tracking hazardous materials and wastes to their ultimate disposal location and management of documentation should be included.

Spill Prevention and Control Measures

The RFMP should include a copy of the ship recycling facility spill prevention and spill response plan. At a minimum, the plan must demonstrate that the facility has adequate containment and spill cleanup equipment and procedures:

.1 identify containment and diversionary structures in place to prevent discharged hazardous materials from reaching navigable waterways;

.2 identify facility drainage areas and location of spill response equipment;

.3 identify environmental protection measures to be implemented during transfer and off-loading of fuels;

.4 identify fuel storage locations on the facility, inspection and record-keeping procedures, security measures, personnel training, and spill prevention procedures; and

.5 identify spill reporting procedures and history of incidents.

Storm Water Pollution Prevention

Storm water runoff from industrial facilities has the potential to adversely effect the environment. Improper storage and handling of hazardous materials and wastes could increase the risk of environmental degradation. The RFMP should include measures to be implemented to prevent storm water contamination. Information related to storm water discharge requirements at the facility should be included:

.1 identify all potential pollutant sources that could come into contact with storm water, receiving waters, and storm wate conveyance systems; and develop a site map;

.2 identify best management practices to reduce the threat of storm water pollution, best management practices for erosion and sediment control, and approaches for the protection of any natural resources; and

.3 identify inspection, maintenance, and record-keeping procedures, security measures, and personnel training.

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ANNEX 2

FACILITY GUIDELINES WHICH WERE PROPOSED BY THE COORDINATOR AT THE 2ND ROUND 1ST STEP (REFERENCE PURPOSE ONLY: AS MATERIAL TO PICK UP RELEVANT TECHNICAL GUIDANCE TO BE EMBEDDED IN THE FACILITY GUIDELINES (BASE OPTION))

INDEX

4. Technical Conditions of Ship Recycling Facility and Equipment

4.1 Ship Recycling Facility Arrangement
- 4.1.1 Zoning
- 4.1.2 Mooring Zone/Primary Cutting Zone
- 4.1.3 Secondary Cutting Zone
- 4.1.4 Finishing Zone
- 4.1.5 Assorting and Storage Zone

4.2 Surface of Facilities
- 4.2.1 Characteristics of Soil and Water Pollution
- 4.2.2 Control Method of Soil Pollution
- 4.2.3 Mud and Soil Control

4.3 Drain Control

4.4 Equipment, Machines and Tools
- 4.4.1 General Requirements
- 4.4.2 Lifting and Block Handling Equipment
- 4.4.3 Miscellaneous Equipment

4.5 Workers' House
- 4.5.1 General Provisions
- 4.5.2 Drinking Water

4.6 Facilities Commonly/Publicly Used
- 4.6.1 Oil/Bilge/Waste Water Treatment Facility and equipment
- 4.6.2 Waste Processing Facility
- 4.6.3 Landfill
- 4.6.4 Incinerator
- 4.6.5 Medical Facility

5. Prevention of Accidents

5.1 Prevention of Fire and Explosion

5.2 Prevention against damage to human health
- 5.2.1 Hazardous Materials to human health
- 5.2.2 Prevention of slip and fall accidents
- 5.2.3 Prevention against dropping and scattering of objects

5.3 Precautions against Spillage of Hazardous Materials

6. Safe and Environmentally Sound Management of Hazardous Materials

6.1 Hazardous liquids, residues and sediments (Oils, Bilge, Ballast water)

6.2 Heavy Metals (Lead, Mercury, Cadmium, Hexavalent chromium)

6.3 Paints and Coatings

6.4 Asbestos and materials containing asbestos

6.5 Polychlorinated Biphenyl (PCBs) and materials containing PCBs

6.6 CFCs and Halons

6.7 Other Hazardous Materials

7. Emergency Preparedness and Response Plan

7.1 General Requirement

7.2 Equipment and Procedure

7.3 Communication

7.4 First Aid

7.5 Response to human injury

7.6 Response to environmental accident

[Preamble]
[To be developed]

1. General Provisions

1.1 Purpose

The purpose of the Guidelines of Safe and Environmentally Sound Ship Recycling (hereafter the Guidelines) is to provide the guidance that will assist the Competent Authorities to apply the provisions of the Convention in uniform manner and to assist Ship Recycling Facilities and other interested parties to fully understand the requirements for Ship Recycling Facilities.

1.2 Application

These Guidelines applies to Ship Recycling Facilities operating under the jurisdiction of the Convention.

1.3 Definition

"Dismantling" means the physical operation of ship recycling such as cutting, ……

[The terms used in the Guidelines have the same meaning as those defined in Article 2 of the Convention, regulation 1 of the annex of the Convention, unless expressly provided otherwise.]

2. Ship Recycling Facility Management Plan (RFMP)

The Ship Recycling Facility Management Plan (RFMP) should be prepared by the Ship Recycling Facilities to demonstrate comprehensive knowledge and understanding of all applicable statutory and regulatory requirements and the operational processes and procedures involved in ship dismantling, as well as a strong commitment to worker health and safety and protection of the environment.

Ship Recycling Facilities should develop RFMP as a comprehensive facility-wide management plan to control, monitor and manage all activities required to the ship recycling operation and to ensure the compliance with the Convention.

2.1 Management policy

Ship Recycling Facilities should establish a management policy in order to perform safe and environmentally sound ship recycling in accordance with these Guidelines and to implement and maintain it. Ship Recycling Facility should continuously improve the effectiveness of its management policy. Ship Recycling Facility should, in RFMP:

.1 clarify the process and application of RFMP throughout Recycling Company;

.2 clarify the requirements set by the Competent Authority for the purpose of the implementation of the Convention and the Guidelines;

.3 clarify the requirements set by across-industry rules and regulations which are applicable to the management and operation of Ship Recycling Facility;

.4 clarify any additional requirements which are deemed necessary by Ship Recycling Facility;

.5 clarify a standard inspection and monitoring criteria and procedure to ensure that the operation and management described in RFMP is effective;

.6 ensure that the necessary resources are allocated and necessary information is made available to implement RFMP;

.7 monitor, measure and analyse the process of implementation; and

.8 take necessary action continuously to ensure uniform and expected outcomes from these processes.

2.1.1 Information on Ship Recycling Facility and Company

RFMP should include:

.1 Administrative information:

.a Organization and management structure;

.b Key personnel – names, roles, and responsibilities (at a minimum the Ship Recycling Facility should have a dedicated environmental, safety, and health manager);

.c Requisite and relevant experience relating to ship dismantlement; and

.d History of operations – including length of time in business and any regulatory action taken in the past.

.2 Ship Recycling Facility information:

.a Physical location – including acreage and Ship Recycling Facility access routes;

.b Facility description – including facility layout, water depth, accessibility, and a drawing or map;

.c Dismantling area description – including all slipway, pier, drydock, or other areas at the Ship Recycling Facility where dismantling will occur;

.d Dismantling capacity – including number of slips, piers, drydocks, or other, equipment capabilities, and total estimated ship recycling capacity; and

.e Production capacity of the material to be reused or recycled – including steel, Hazardous Materials, and recyclables, procedures for material segregation, and the flow charts of material processing.

2.1.2 Responsibility of Managers

2.1.2.1 Commitment of Managers

Top management of the Ship Recycling Facility should indicate in RFMP its commitment to the implementation and continuous improvement of RFMP. Such commitment should include:

.1 to comply with the national regulations;

.2 set the policy to minimize and eliminate to the extent practicable of the adverse effects on human and the environment caused by Ship Recycling;

.3 set the environmental and safety management targets;

.4 execute management review; and

.5 ensure that resources are available.

The policy of listed in .2 above should be communicated to and understood by the entire Ship Recycling Facility. The environmental and safety management targets should be achievable, and in line with the policy.

2.1.2.2 Responsibility, Authority, and Communications

The top management should ensure that the responsibility and the authority should be clearly established in RFMP, and well-known to the entire Ship Recycling Facility.

.1 Top management should appoint management representative(s) among the management levels. Representative(s) should, in addition to any other responsibilities that they are given:

.a establish necessary processes for RFMP, and ensure both implementation and maintenance of them;

.b report the implementation status and the necessity for the improvement of RFMP to top management; and

.c ensure that the consciousness of environmental and safety controls are improved throughout the entire organization.

.2 the responsibilities and the authority of personnel should be clarified in the organizational chart and job assignment, and be communicated to the entire Ship Recycling Facility;

.3 top management should review RFMP at scheduled intervals to ensure that RFMP is continuously updated and effective. The review should evaluate necessity of amendment including the policy of the Ship Recycling Facility and the safety and environmental management targets; and

.4 the review by the top management should include the following information:

.a Results of inspection on environmental and safety issues;
.b Feedbacks from the Competent Authority and other regulatory agencies
.c State of implementation of the management process;
.d State of the implementation of precautionary measures and corrective measures;
.e Follow up of the previous review.

2.2 Management of resources

The Ship Recycling Facilities should identify and provide necessary resources as outlined below, in order to implement, maintain, and continuously improve the effectiveness of RFMP.

2.2.1 Human Resources

The Ship Recycling Facilities should:

.1 clarify the required level of competence of the worker for the assignment to a specific job;

.2 educate and train workers to have the competence necessary to fulfil their assigned jobs;

.3 evaluate the effectiveness of the education, training and other programmes implemented;

.4 ensure that each worker in the Ship Recycling Facilities recognizes the meaning and the importance of his/her own activity, and understands how the activity contributes to the accomplishment of the goal; and

.5 maintain the relevant record regarding the education, training, skill, and experience of workers.

2.2.2 Infrastructure

The Ship Recycling Facility should identify, provide and maintain the infrastructure needed in achieving the safety and environmental management targets. Such infrastructure should include:

.1 buildings, working areas, and related utilities (wharves, docks, jetties, electricity, gas, water, etc.);

.2 equipment (cranes, other heavy equipment, tools, office equipment, computers, etc.); and

.3 supporting facilities (truck transportation industrial waste processors, communication, etc.).

2.2.3 Working Environment

The Ship Recycling Facility should identify, operate and maintain the working environment necessary to meet the management targets in line with these Guidelines. The working environment should include but not limited to:

.1 gas-free areas;

.2 confined work areas;

.3 work areas for removal of Hazardous Materials;

.4 work at elevated position; and

.5 areas for works with toxic fumes such as steel cutting with gas.

2.2.4 Others

.1 Preservation of Products and Waste:

Ship Recycling Facilities should preserve the products and waste in the period from internal processing to the dispatch of those products in compliance with applicable regulations. The preservation process should include identification, storage, handling and protection of products and waste.

.2 Management of Monitoring and Measurement Instruments:

The Ship Recycling Facility should:

- calibrate and check the proper function of these instruments in conformity with relevant national regulations before using them or in scheduled interval; and

- protects instruments from damages so as not to be deteriorated when it is in use, maintain and storage.

The Ship Recycling Facility should identify monitoring and measuring instrument necessary to meet the requirements set out in 2.4.

2.3 Emergency Plan

The Ship Recycling Facility should develop and maintain an Emergency Preparedness and Response Plan in line with the Section 7. “Emergency Preparedness and Response Plan” in these Guidelines.

The Ship Recycling Facility should review/monitor the implementation of the plan in light of the following points:

.1 the necessary equipment and procedures to be followed in case of an emergency;

.2 the necessary information and internal communication needed to protect all personnel in the event of an emergency;

.3 the necessary information and communication with relevant authorities and the neighbourhood in case of an emergency;

.4 a contingency plan in case of fire, explosions, spills, exposures, etc.; and

.5 implementation of a training programme for emergency preparedness and response.

2.4 Monitoring of Performance

2.4.1 Monitoring of the performance of the Ship Recycling Facility

.1 The Ship Recycling Facility should review and monitor the requirements to achieve the management targets. The review and monitoring should ensure that:

- requirements set by Competent Authority and other relevant requirements are clearly identified;

- these Requirements are continuously updated; and

- Ship Recycling Facility maintains the capability to satisfy these requirements.

.2 Confirmation of the compliance with of the Ship Recycling Plan:

The Ship Recycling Facility should confirm whether its ship recycling operation followed the procedures described in the Ship Recycling Plan. If records are kept regarding such confirmation, remedial action and improvements in the recycling operation, they should be accurately maintained.

.3 Traceability:

The Ship Recycling Facility should identify the products and industrial waste generated in the process of the ship recycling by an appropriate means. Such identification should be made in relation to the requirements of monitoring and measurement as described above.

Where the traceability is a requirement set by the Competent Authority, the Ship Recycling Facility should identify a product and/or industrial waste in accordance with such requirements, and maintain a record.

2.4.2 Monitoring of Hazardous Materials

The Ship Recycling Facility should establish and specify in RFMP the monitoring system of Hazardous Materials which may affect environment or human health.

Monitoring of Hazardous Materials should be done in accordance with national regulations.

2.4.2.1 Monitoring on environment

RFMP should demonstrate that the Ship Recycling Facility:

.a understands the environmental risks associated with ship recycling;

.b understands and implements the environmental requirements imposed by national regulations;

.c can manage and dispose of all the materials used in the structure of the ship, its equipment and/or on board the ship in an environmentally sound manner, except those materials that the Ship Recycling Facility is not authorized to handle; and

.d implements the controls to protect the environment, which include handling and disposing of the Hazardous Materials.

RFMP should identify all authorizations, permits, certificates, approvals, and licences required by national regulations to carry out the work, including those required for the management of Hazardous Materials.

In accordance with national regulations, the Ship Recycling Facility should establish the monitoring system on Hazardous Materials which can be released to ground, water and air, in addition to noise/vibrations that could affect the surrounding environment, taking into account that:

.1 Typical types of release during ship recycling work are:

.a release to water and ground (i.e. fuel oil, lubricants, hydraulic oil, waste water/bilge, cargo residues, sludges, PCB and materials containing PCBs, heavy metals, paints and coatings containing toxins, asbestos-containing material, etc.); and

.b emission to air (i.e. asbestos and materials containing asbestos, PCB and materials containing PCBs, volatile organic compounds (VOCs), toxic fumes, etc.).

.2 in order to monitor any changes in the environment, Environmental Impact Assessment (EIA) is recommended to implement prior to start the monitoring system; and

.3 sampling data and information should be utilized for assessment of the risk to improve and/or preserve the environment.

2.4.2.2 Monitoring on human health

In accordance with national regulations, the Ship Recycling Facility should ensure that workers are not exposed to Hazardous Materials to an extent that exceeds the exposure limits.

The Ship Recycling Facility should identify whether Hazardous Materials are present in the workplace and monitor the exposure of workers to ensure their safety and health;

.1 the workplace should be checked and monitored whether hazardous substances are present utilizing the Inventory of Hazardous Materials;

.2 monitoring of airborne contaminants and soil contaminants should be performed with adequate equipment and by competent person in accordance with national regulations;

.3 Personal monitoring should be done to evaluate the risk of exposure to the individual worker. Samples should be collected in the workplace; and

.4 sampling data and information should be utilized for assessment of the risk to improve and/or ensure the health of the workers.

2.5 Record

Ship Recycling Facilities should develop and maintain recycling company policies and procedures for retaining important records associated with the dismantlement of the ship – including but not limited to the following:

.1 records regarding the education, training, skill and experience of workers;

.2 records regarding confirmation of compliance and necessary improvement of the Ship Recycling Plan;

.3 records to identify the products and industrial wastes generated in the process of the ship dismantling by an appropriate means (including the final disposal of all Hazardous Materials, volume of the wastes delivered to the outside facility, etc.); and

.4 records of incidents (including identification of possible near-misses).

The records and relevant documents should be easily identified, retrievable and legible. The Ship Recycling Facilities should establish necessary procedures for the identification, protection, retrieval, custody period and disposal of the records and relevant documents.

3. Ship Recycling Procedures and Techniques

3.1 Principles

Ship recycling work should be carried out through Environmentally Sound Management (ESM) in order to protect human health and minimize the negative impact to the environment.
The work should also be carried out in line with the Ship Recycling Plan. Ship recycling works should be carried out in line with the procedures and techniques as outlined below.

3.2 Standard procedures

Ship recycling work consists of following 4 steps:

Step-I: Preparation before starting Ship Recycling

Step-II: Removal of Hazardous Materials

Step-III: Dismantling

Step-IV: Documentation

Ship recycling procedures and techniques have many variations.

The procedure and techniques to be utilized is dependent on location, area size, infrastructure and equipment of individual Ship Recycling Facility.

Ship recycling procedures and techniques which have been commonly adopted in the world are presented in the appendix-1 for reference.

3.2.1 Step-I: Preparation before Starting Ship Recycling

3.2.1.1 Confirmation before ship acceptance

Upon arrival at the area of Ship Recycling Facility, but before grounding, mooring, or docking of the ship, and prior to the commencement of any ship recycling operation including the removal of Hazardous Materials at the Ship Recycling Facility, the Ship Recycling Facility should confirm the conformity with the following requirements for ship acceptance:

.1 the ship has an International Ready for Recycling Certificate (IRRC) with attachments including Inventory of Hazardous Materials and Ship Recycling Plan;

.2 The shipowner has reported the following information to the Ship Recycling Facility:

- Draft (Fore and aft)
- Trim
- Required mooring arrangement
- Required amount of ballast for trim adjustment
- Evacuation pathway in case of emergency:

.3 the shipowner has ensured that the conditions of each tank and the adjacent area satisfy the criteria for dock-in as defined in paragraph (3) of Section 5.1 “Prevention of Fire and Explosion” of these Guidelines;

.4 the shipowner has reduced the amount of fuel oil on board and the number of tanks in use as far as practicable;

.5 the condition of each area has been reported by the shipowner to the Ship Recycling Facility by utilizing the form “Tank Condition Note” as indicated below; and

TANK CONDITION NOTE (Sample Form)							
Name of Ship	YYYYYYYY						
Date of Survey	XX. XX. 20XX.						
Name of Compartment	Loaded or treated materials	Oxygen level (Vol%)	Gas concent-ration (Vol%)	Residual oil (% of area)	Sludge (% of area)	Bilge (% of area)	Remarks
No.1COT(P)	Crude oil	20	0.08	0	0.1	0	Gas-freed
No.1COT(S)	Crude oil	20	0.08	0	0.1	0	Gas-freed
No.1DBT (C)	Adjacent area	20	0	0	0	0	
No.1WBT(P)	Adjacent area	20	0	0	0	0	
No.1WBT(S)	Adjacent area	20	0	0	0	0	
-							
Cargo pump room	Crude oil	20	0	0	0	0	Gas-freed
Responsible person Sign							

.6 pre-cleaning work as described in the Ship Recycling Plan has been completed. The shipowner has indicated unscheduled changes in the Inventory of Hazardous Materials after the date of issuance of an International Ready for Recycling Certificate (IRRC).

In case of accepting a cargo ship that has been engaged in the transportation of dangerous liquids in bulk, such as chemical tankers, the Ship Recycling Facility should carefully determine the ship's acceptance conditions. The shipowner should ensure that the ship can satisfy such acceptance conditions.

3.2.1.2 Confirmation of the Delivery Conditions of the Ship

After ship acceptance, confirmation of the delivery conditions of the ship to be recycled should be done strictly in line with the Delivery Conditions and with the shipowner in attendance.

.1 Confirmation of Plans and Documents

To the extent possible, the following plans and documents should be received from shipowner:

- Final Specifications
- General Arrangement
- Midship Section
- Construction Profile and Deck Plan
- Shell Expansion Plan
- Longitudinal and Transverse bulkhead
- Fore and Aft Construction
- Superstructures
- Accommodation Plan
- Capacity Plan
- Hydrostatic Curve
- Trim and Stability Calculation,
- Light Weight Calculation Table

- Deck Piping System
- Fire Control Plan
- Painting Scheme
- Joiner Works
- Engine Room Arrangement
- Pump Room Arrangement
- Engine Room Piping Diagram
- Drawings of major equipment by manufacturers

.2 Identification of Hazardous Materials

An inventory survey of the ship should be carried out in the presence of shipowner, in accordance with the Inventory of Hazardous Materials ("Inventory"):

.a asbestos, PCBs, other Hazardous Materials and ship tanks such as COT, FOT, LOT, FWT, WBT should be clearly marked in a manner that is easily identifiable;

.b where Hazardous Materials listed in Inventory could not clearly identified by their position and volume, sampling analysis and/or visual inspection should be carried out in the presence of shipowner to enable the identification; and

.c where any unknown Hazardous Materials not listed in the Inventory are found, the Ship Recycling Facility should consult with the shipowner for the appropriate treatment thereof. Based on the additional survey and identification exercise, the Inventory and the Ship Recycling Plan may require amendments.

3.2.1.3 Development of required detailed Operational Plan

Prior to proceeding to step-II, the further detailed Operational Plan required to carry out the variety of the recycling works should be developed based on the Inventory of Hazardous Materials, data confirmed and information collected with related to the ship to be recycled at the stage of step-I.

Such Operational Plan should but not limited to the following:

.1 Hazardous Materials Removal and Management Plan; and

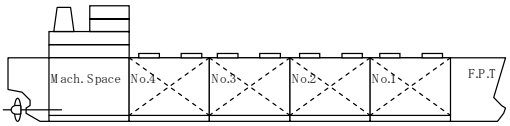
.2 Dismantling Plan including mooring and cutting plan of the ship, and workforce deployment plan.

The above-mentioned Operational Plan is an internal work plan necessary for ship recycling operation ship by ship and should be developed by the Ship Recycling Facilities. These detailed plans can be utilized as the Operational Plan required to be set forth in the Ship Recycling Plan.

Operational plan is presented in detail in appendix 2.

AN EXAMPLE OF DISMANTLING SCHEDULE FOR 24,150 LT. LDT. DIESEL ORE/OIL CARRIER
(WEIGHT OF PRODUCTS: 22,400 t)

PERIODS IN TENTH		1/10	2/10	3/10	4/10	5/10	6/10	7/10	8/10	9/10	10/10	TOTAL
WEIGHT DISMANTLED FROM VESSEL		1,000	1,900	1,800	2,600	2,600	3,000	3,100	2,700	2,600	1,100	22,400
DISMANTLING PORTIONS / SCRAPPED ON LAND		700	1,800	1,700	2,500	2,500	3,000	3,000	2,800	2,500	1,900	22,400
PREPARATION BEFORE CUTTING WORKS		←										
FITTING ON DECKS		300										
SUPERSTRUCTURES & DECK HOUSES		500	300									
ABOVE WATER	FORE PEAK TANK & NO.1 HOLD & WING TANKS	200	1,600	1,600								
ABOVE WATER	STERN CONSTRUCTIONS HULL STRUCTURES ALONG MACHINERY SPACES				200	800	800	1,000	700			
ABOVE WATER	MACHINERY & FITTINGS & IN MACHINERY SPACES					600	600	400				
ABOVE WATER	Nos. 2,3 & 4 HOLDS WING TANKS			(DECK) (SHELL & BHD.)	1,200	1,200 (No.2)	900	1,700 (No.3)	2,000 (No.4)	600		
BOTTOM CONSTRUCTIONS				200 (F.P.T. & NO.1)	1,200		700 (FWD PART OF NO.2)			700 (CUT BELOW WATER L. (MACH. SPACE)	1,300 1,100 (GROUNDING ON SHORE (REMAINED HOLD PARTS)	
WEIGHT OF PRODUCTS	RE-ROLLABLE MATERIAL		800	1,000	1,800	1,600	2,100	2,100	2,100	1,700	1,300	14,500
WEIGHT OF PRODUCTS	STEEL SCRAP	700	1,000	670	650	750	750	700	600	650	460	6,930
WEIGHT OF PRODUCTS	CAST IRON SCRAP						100	100			90	290
WEIGHT OF PRODUCTS	NON-FERROUS METAL SCRAP			30			50		50		50	180
WEIGHT OF PRODUCTS	FORCED STEEL MATERIAL					50		100		100		250
WEIGHT OF PRODUCTS	RE-USABLE GOOD				50	100			50	50		250



3.2 2 Step-II: Removal of Hazardous Materials

Prior to the demolition works at the Ship Recycling Facility, the ship should be cleared of hazardous materials in line with following guidance.

3.2.2.1 Tank cleaning and gas-free

Standard Tank cleaning procedures are as follows:

.1 arrange ventilation equipment, lighting apparatus and oil cleaning apparatus appropriately;

.2 arrange the precautions to prevent any hot works during the tank cleaning work;

.3 transfer all residual fuel oil, lubricating oils, hydraulic oils and other oils and chemicals in tanks and piping system to appropriate reception facilities, or to subcontractor who accept such oils and chemicals;

.4 transfer bilge water and oily water to reception facilities;

.5 clean up sludge and residual oil inside tanks manually by workers or subcontractors;

.6 all tanks and their adjacent compartments where explosive gas has been stored should be checked to ensure that oxygen and petroleum gas concentration levels satisfy the criteria as defined in Section 5.1 “Prevention of Fire and Explosion” of these Guidelines. The gas concentration level at tanks, enclosed and/or confined

spaces should be again checked, after the residual oils are transferred to the reception facilities;

.7 oxygen and gas concentration levels in any gas-free tank should be checked prior to the start of hot work;

.8 when oxygen and gas concentration level no longer satisfies the above criteria, tank cleaning and gas-free work should be carried out again; and

.9 tank cleaning and gas-free work should be carried out in accordance with Section 5.1 "Prevention of Fire and Explosion" of these Guidelines

3.2.2.2 Removal of identified Hazardous Materials:

.1 after confirmation in step-I, identified Hazardous Materials should be properly removed in a safe and environmentally sound manner in line with "Hazardous Materials Removal and Management Plan" developed in step-I. (refer to appendix 2);

.2 safe and environmentally sound removal and management of hazardous materials should also be carried out in line with Section 6. "Control of Hazardous Material" of these Guidelines; and

.3 prior to the cutting work, remove all loose items (i.e. furniture, electric equipment, stationary, etc.) and flammable items (i.e. joiner works), as much as possible.

3.2.2.3 Handling and storage of Hazardous Materials

.1 all material and waste streams should be stored separately in the Storage Zone defined in Section 4.1.5 and be handled with a suitable good housekeeping practice including provisions for:

.a the storage of materials and equipment; and

.b the removal, at appropriate intervals, of scrap, waste and debris.

.2 loose materials which are not for immediate use should not be placed or allowed to accumulate on the site so as not to dangerously obstruct the access to, and egress from, workplaces and passageways;

.3 rubbish, dirt and refuse should not be thrown overboard but removed ashore in an environmentally sound manner;

.4 packaging and containerization should comply with the national regulations, e.g., double layers for asbestos removal and handling, air tight containers for volatiles including CFCs and Halons. Packaged/contained waste should be labelled appropriately;

.5 the waste stream generating from dismantling and sorting process, which are suitably packaged and safely transported, should be stored on-site or off-site according to applicable national regulations; and

.6 The Ship Recycling Facilities may themselves manage the disposal of hazardous waste, or may entrust the disposal to a certified company or local authority. Regardless of the mechanism, the final disposal of all Hazardous Materials should be thoroughly arranged and documented

3.2.3 Step-III: Dismantling

Dismantling should be done in line with the Dismantling Plan.

3.2.3.1 Mooring Work

After the confirmation of step-I and step-II, mooring works should be carried out in line with the Mooring Plan made as a sub plan of the Operational Plan provided at the stage of step-I (refer to appendix 2)

3.2.3.2 Dismantling Work

Cutting works below-mentioned should be carried out in line with the Cutting Plan made as a part of the Operational Plan provided at the stage of step-I. (refer to appendix 2)

In addition to the above, dismantling work of ship should take into account Section 5, "Prevention of Accidents" of these Guidelines, in order to prevent fire, explosion, contamination by Hazardous Materials, or other accident:

.1 Primary cutting work (at Primary Cutting Zone)

Primary cutting work is the primary process to cut the ships hull into the large sized block and remove large machines from the ship at the primary cutting zone with hot work.

Sequence of the primary cutting work should follow the Cutting Plan in order to keep the hull condition is in stable and safe.

The hot work for the primary cutting can start provided that the all works set forth in step-II has been confirmed "Completed".

Primary cutting work should be carried out taking into account the followings in addition to the guidelines set forth in Section 5 Prevention of Accidents:

.a when the ship is in an afloat condition, bottom block of the ship should be cut in the air above the waterline by adjustment its trim;

.b when conducting cutting work at sea or at the grounding condition, provide plate or other measures to prevent toxic substances and/or other pollutant from falling into the sea or onto the beach;

.c when conducting cutting work, appropriate fire extinguisher should be provided adjacent to the workplace. It is preferable that fire-fighting water can be used at any time whenever cutting work is being done;

.d provide fire-fighting water and/or fire extinguishers to control fire involving highly flammable paint; and

.e any large blocks over [10] tons should not be allowed to fall free onto the beach or land. Large sized blocks should be transferred from the primary cutting zone to the secondary cutting zone by utilizing cranes or other appropriate heavy lifting equipment.

.2 Secondary cutting works and finishing works (at the secondary cutting zone and the finishing zone)

Secondary cutting works is the process by which the large size steel blocks and/or machinery from the ship are cut into medium-sized blocks.

Finishing works is the process by which the medium-sized blocks are cut into the smaller pieces to be removed from the Ship Recycling Facilities as final products or wastes, or to be stored at the Ship Recycling Facilities in an orderly manner:

.a secondary cutting works and finishing work should not be done in the same area;

.b the medium-sized blocks should be moved immediately to the finishing area for final cutting and storage;

.c waste generated during cutting works should be treated appropriately to minimize the negative impact to the environment as well as to human health;

.d proper arrangement of cutting tools and lifting and transporting appliances should be provided; and

.e when hot work can not be applied due to the potential risk of fire, explosion and/or poisoning by harmful fume, mechanical tool for cutting the blocks is effective.

.3 Storage works

.a all materials and waste should be stored separately by their types in the storage zone;

.b special attention should be given to the storage of asbestos or asbestos-compounded materials;

.c staff working with asbestos storage should be equipped with proper PPE, according to national regulations;

.d Hazardous Materials, and especially asbestos bags, should be stored in dedicated indoor storage area;

.e the storage of liquid waste should be stored under a roof, and on the impermeable floor; and

.f electric cable Insulation should not be burnt in open air.

3.2.4 Step-IV Documentation

.1 after completion of recycling work of the ship in Ship Recycling Facility, it should be confirmed that the ship was recycled in line with Ship Recycling Plan appropriately by checking the relevant record and documents;

.2 handling and disposal of each Hazardous Material listed in the Inventory should be identified;

.3 when any deference between actual recycling operation and the Ship Recycle Plan is identified, the reason of such difference should be investigated and reported to Competent Authority; and

.4 the Ship Recycling Facility should issue Statement of Completion of Ship Recycling after the confirmation of the process above mentioned.

4. Technical Conditions of Ship Recycling Facility and Equipment

4.1 Ship Recycling Facility Arrangement

Ship Recycling Facilities should be properly arranged taking into consideration the specific functions of ship dismantling areas, warehouse, office, workers' house, workshops, etc.,

4.1.1 Zoning

Ship Recycling Facilities should consider the proper arrangement of the facilities taking into account dismantling capacity (volume), dismantling procedures, procedures to manage Hazardous Materials, safety as well as healthy work environment.

The Ship Recycling Facility should consider appropriate zoning taking into account the Operational plan set forth in the Section 3, link between associated activities and the potential environmental threat that they represent. Regardless of recycling method, zones are generally categorized as follows:

1. Mooring zone/Primary cutting zone;

2. Secondary cutting zone;

3. Finishing zone; and

4. Assorting and storage zone

4.1.2 Mooring zone/Primary cutting zone

The ship to be recycled should be safely fixed by grounding in the inter-tidal zone, or moored along the wharf/quay in this zone. Hazardous Materials and out-fittings are removed, tank cleaning is carried out as necessary, and cutting of the hull into large steel blocks takes place.

In cases of Dry method, a ship to be recycled enters in dry dock or floating dock, and then operation including cutting of the hull into large steel blocks starts.

The area used for the above work is "Mooring Zone/Primary Cutting Zone".

"Mooring Zone/Primary Cutting Zone" should satisfy the following conditions in order to minimize the damage to the environment and the risk to occupational safety and health.

.1 Mooring arrangement and wharf

The mooring method varies depending on the facility layout, as well as the ship dismantling practice being used.

The mooring arrangement should be provided to secure the ship safely moored and demolished taking into account the size and type of ship.

Required mooring arrangement such as bitts, winches, etc., should be secured in line with the guidance shown on the table in appendix 3 attached hereto.

.2 Other facility and equipment

Other facility and equipment should be provided in accordance with the guidance shown on the table in the appendix 3 attached hereto.

4.1.3 Secondary Cutting Zone

Secondary Cutting Zone is an area where the cutting of large steel blocks from the ship into medium-sized blocks and the removal of machinery from the large blocks takes place.

Remaining insulations, out-fittings, residual oils, sludge, and bilge are collected prior to or during the cutting. This zone should not be under water in high tide in any recycling practice.

Other facility and equipment should be provided in accordance with the guidance shown on the table in appendix 3.

4.1.4 Finishing zone

The Finishing zone is where further cutting of the steel blocks from the secondary cutting zone into the shape of final products takes place. Nonferrous metals are similarly sorted by type.

The mixed residues with ferrous and nonferrous metals, electric cables, and plastic which have been generated in the process of dismantling are sorted and kept in this area.

Residual Hazardous Materials which could not be removed in step-II such as sheet packing containing asbestos should be removed in this zone.

Proper arrangement should be done in accordance with the technical guidance in appendix 3.

4.1.5 Assorting and Storage Zone

Materials arriving from other dismantling zones are collected in this zone for temporary storage prior to the sales and/ or for further treatment. The materials for reuse and recycling and the wastes should be stored separately in this area. Special attention should be given to the storage of asbestos or asbestos-compounded materials with the guidance shown on the table in appendix 3.

4.2 Surface of Facilities

Various soil pollutants may be generated during the dismantling work at Ship Recycling Facilities. In order to prevent soil and water pollution by Hazardous Materials, the following guidance for the structure of the surface of facilities should be observed.

4.2.1 Characteristics of Soil and Water Pollution

Hazardous Materials in the soil may potentially be a cause of the damage to the human health. There are two kinds of risks:

- a risk taking the contaminated soil including Hazardous Materials directly – Direct Intake: and

- a risk taking contaminated subsurface water caused by infiltration of Hazardous Materials from the soil – Subsurface Water Intake.

Materials such as fuel oil, lubricating oil, waste oil (not including asphalts), and fats also pollute the soil and subsurface water.

Volatile organic compounds can infiltrate quickly since they are heavier than water and their viscosity is lower. These compounds often contaminate the subterranean streams. Moreover, the air in the stratum might be polluted since volatility is high, and may be discharged into the atmosphere.

On the other hand, heavy metals are absorbed easily by the soil, and the pollution may not expand at the same rate as volatile organic compound.

The following Hazardous Materials that are generated through the ship dismantling process may contaminate the soil and subsurface water. These materials should be removed before cutting the hull. Special attention to PCBs and oils in particular should be made at the treatment and storage facilities.

Hazardous Materials	Risk by direct intake	Risk by subsurface water intake
PCBs	-	O
Cadmium & Cadmium Compounds	O	*
Hexavalent Chromium Compounds	O	*
Lead and Lead Compound	O	*
Mercury and Mercury Compound	O	*
Oils	-	O

O: high risk
*: moderate risk

4.2.2 Control Method of Soil Pollution

With regard to soil and subsurface water pollution, and the following control measures of contaminated soil, namely, the replacement of the polluted soil or reclamation on any polluted soil or the use of impermeable flooring should be taken to mitigate risk by indirect intake.

Pavement (Impermeable floor)[*1]	Facility for Oil & Other Hazardous Materials in Assort & Storage Zone
Soil Replacement or Reclamation	Secondary Cutting Zone, Finishing Zone and Assort & Storage Zone

Regardless of the above actions, the soil and water pollution should be checked in accordance with national regulations on the control of these pollutions.

[*1] The adoption of either asphalt or concrete pavement should be determined taking into account the safety of recycling work. The floor should not easily be broken by the heavy loaded blocks and equipment. Special attention should be given to heavy equipment that operates on paved flooring, as the pavement tends to be slippery when muddy or wet.

4.2.3 Mud/Soil Control

During ship dismantling work, a large amount of useless refuse and rubble, such as rust from the ballast tank, mud, cement, pavement, tiles, sand, pebbles, etc., collectively known as mud, may accumulate in bulk inside the yard and affect the safety. Such mud may contain Hazardous Materials, and should be collected periodically and stored in one place.

The mud should be removed from the Ship Recycling Facility as industrial wastes. Dumping such waste into the sea is strictly prohibited. After removal of the mud, the surface of the Ship Recycling Facility should be properly reclaimed in accordance with national regulations.

4.3 Drain Control

Ship Recycling Facilities should control the drainage from the facility to the sea/water by adopting the following methods.

Oily Drain	Provide coaming /cofferdam/oil pans
Mud	Provide area drainage or alternative measures to prevent mud from flowing directly into the sea

4.4 Equipment, Machines and Tools

4.4.1 General Requirements

Equipment, machines and tools at the Ship Recycling Facilities should satisfy the following guidance:

.1 equipment and machines used should be have adequate capacity and strength for the work, and should be easily maintained and repaired;

.2 when machines or equipment which were originally fitted on dismantled ships are used in the Ship Recycling Facility, special attention should be given to their adoptability, as such machine and equipment is not designed for on-land use;

.3 operation standards, manuals and a programme for maintenance, repair and replacement of parts, should be provided. Maintenance should be carried out strictly in line with the programme in order to ensure safety;

.4 machines and equipment should only be used or operated by the authorized operators/workers or the workers who have been given appropriate training; and

.5 transport facilities for Hazardous Materials and waste should comply with national regulations regarding design, construction and operation.

4.4.2 Lifting and Block Handling Equipment:

.1 appropriate lifting equipment such as, floating crane, mobile cranes and winches should be arranged in the Ship Recycling Facility in accordance with the zone and works allocated to each zone;

.2 the maximum load of the lifting equipment should be clearly marked in a conspicuous place. The maximum safe working load should be in accordance with national regulations. Where the lifting equipment has a variable working load (e.g., mobile crane with variable reach), it should be fitted with a load indicator that indicates the safe working load with outreach;

.3 other lifting gears such as chain blocks, ropes, wire ropes, etc., should be provided and maintained properly; and

.4 for the handling of blocks, products, re-usable machines and waste, the following equipment should be used when possible:

- Excavator: for handling heavy objects, cutting hull plate and sorting products and waste, using the optional attachment, i.e. the demolisher (shear head) and magnet lifter;

- Folk Lift: for sorting and for shifting steel plates and machinery;
- Dump Truck: for transporting waste and products;
- Bulldozer: for sweeping, removing heaped up substances (mud, rust) and levelling the ground; and
- Aerial platform: for work at elevated position.

4.4.3 Miscellaneous Equipment

.1 oxygen, LPG and Acetylene supply system should be arranged inside the Ship Recycling Facility. When these gases are supplied by cylinders, the cylinders should be properly secured and kept upright and away from sparks excessive heat and other gases;

.2 adequate electric power supply should be provided by means of a city power supply or engine generator. A power supply/distribution system should be safely installed to ensure that the electric cable is not damaged during work;

.3 a truck scale with a capacity of 40~50 tons should be installed to measure the weight of the products, Hazardous Materials, and mud. A scale with a digital indicator and printer is preferable, as it can print out light weight, fully loaded weight and the difference between them; and

.4 a work boat for mooring rope handling, oil boom extension, and pollution monitoring should be provided. A tug boat should be available to guide ships to the Ship Recycling Facility whenever required.

4.5 Workers' Housing

4.5.1 General Provisions

The Ship Recycling Facilities should have appropriate hygiene facilities for workers such as:

.1 Decontamination areas (sanitary and washing facilities or showers)

Sanitary and washing facilities should be provided by the Ship Recycling Facility to enable workers 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 exposed to contamination from the workplace;

.2 Facilities for changing

Suitable changing rooms/spaces that are easily accessible by the workers should be provided;

.3 Besides the above-mentioned changing room exclusively used for the workers who handle asbestos should be provided. The changing room should be equipped with shower facility and designed to prevent the exposure of asbestos; and

.4 Facilities for taking rest and meals

The Ship Recycling Facility should provide places for washing, taking rest and meals that are available within the worksite or at an easily accessible place. Where it is necessary to prohibit eating or drinking on site, suitable facilities should be arranged for these activities in an uncontaminated area.

4.5.2 Drinking Water

An adequate supply of drinking water should be provided at or within reasonable access to the facility. Water that is unfit to drink should be conspicuously identified by notices prohibiting drinking.

4.6 Facilities Commonly/Publicly Used

It is impossible to process all the generated wastes completely within a Ship Recycling Facility. Therefore, the Ship Recycling Facility may share with several other Facilities the processing of Hazardous Materials, or it may consign the processing to external processing facilities.

When the Ship Recycling Facility uses the external processing facilities, the Ship Recycling Facility should confirm that the external process facilities have enough capability by checking their certificates and authorization in accordance with national regulations.

When the generated waste is processed or delivered to the other waste treatment and/or disposal facilities, the Ship Recycling Facility should identify and consign properly the authorized facilities.

4.6.1 Oil/Bilge/Waste Water Treatment Facility and Equipment

.1 oil collecting tanks, bilge /oily water separators, etc., should be installed in the Ship Recycling Facilities, to collect residual oils and/or oil contaminated water from the ship. Pumping devices to transfer and/or stripping the residual oils to the oil treatment facility should also be provided.

The oil treatment facility should perform in accordance with the applicable national regulations regarding water pollution. If the volume of residual oil is larger than the tank capacity, an oil barge should be used, residual oil should be delivered to an existing oil treatment facility; and

.2 with any ship recycling practice, oil, bilge, waste water treatment may be entrusted to an existing oil treatment facility if it has the appropriate capacity.

As an alternative, one oil/bilge/waste oil treatment facility may be established and operated in the area where a number of Ship Recycling Facilities are located.

4.6.2 Waste Processing Facility

Where, the wastes generated from the Ship Recycling Facility can be processed at an outside final processing facility in accordance with national regulations and where the Ship Recycling Facility does not have the processing equipment within it, the processing can be consigned to

such outside final processing facility. In such a situation the record of the volume of the wastes delivered to the outside final processing facility should be always maintained.

4.6.3 Landfill

The processing of industrial wastes such as asbestos, soil and dirt that can be reclaimed should be treated according to national regulations.

4.6.4 Incinerator

The facility may incinerate the waste by appropriate incinerator in accordance with national regulations, as far as the wastes are combustible and do not generate dioxin during incineration.

Where an existing incineration facility has enough processing capability, the incineration may be consigned to such facility.

As an alternative, an incineration facility may be established and operated in the area where a number of Ship Recycling Facilities are located.

4.6.5 Medical Facility

The facility should have first-aid kits or boxes to respond to injuries or exposure to Hazardous Materials.

The facility should identify and secure the availability of health care facilities and/or hospital within a reasonable distance when further medical treatment and care is necessary.

5. Prevention of Accidents

Ship Recycling Facilities should have Safety Control Procedure to prevent accidents that cause damage to humans or environment.

Safety Control Procedures should be developed by competent persons who possess a thorough knowledge of safe ship recycling practices and procedures including the precautionary and preventive measures necessary to guard the safety and health of workers and to protect the environment.

In order to develop the Safety Control Procedures, Ship Recycling Facilities should conduct a job hazard assessment to determine the proper approach to maximize worker safety

The Safety Control Procedure should include the following:

5.1 Prevention of Fire and Explosion

Precautionary measures against fire and explosion should be taken as follows:

.1 the Ship Recycling Facility should confirm gas-free conditions before ship acceptance in line with the criteria for gas-free for grounding, mooring, and/or docking;

.2 the Ship Recycling Facility should avoid cargo oil tank cleaning by utilizing the ship's washing system (crude oil washing system, steam washing, etc.) in the Ship Recycling Facility; and

.3 confirmation of gas-free conditions should be made by the Ship Recycling Facility before the commencement of any works inside the tanks or confined spaces in line with criteria for gas-free for hot work.

Criteria of the Gas-Free Conditions for work to be performed are set as follows:

For Fuel Oil Gas

Gas Contents of Fuel Gas (Vol %)	**Applicable to**	**Restriction**
Less than 0.1 %	Work compartment and adjacent compartment	Hot work permitted

For Petroleum Cargo Gas

Gas Contents of Petroleum Gas (Vol. %)	**Applicable to**	**Restriction**	**Remarks**
More than 0.1 %	All cargo area and adjacent compartments	"Dock-in" restricted Restricted to Enter	Shipowner should satisfy the gas-free criteria for Dock-in.
More than 0.05 % Less than 0.1 %	All cargo area and adjacent compartments	"Dock-in" permitted Cold work permitted	Gas-free works after dock-in should be done by the facilities The facilities should keep the gas contents less than 0.1 %
Less than 0.05 %	Work compartment and adjacent compartment	Hot work permitted	Both work compartment and adjacent compartment should be kept less than 0.05% Even if the gas content is satisfactory, hot work should not be done in case flammables. are present.

For Oxygen

Gas Contents of O2 (Vol %)	**Applicable to**	**Restriction**
Less than 19.0% More than 23.0%	Work compartment	Restricted to Enter Hot Works restricted
More than 19.0% Less than 23.0%	Work Compartment	Permitted to Enter Hot Work permitted

For LP Gas

Gas	Gas Contents (Vol %)	Applicable to	Restriction	Remarks
LPG	More than 0.19%	All cargo tank and adjacent compartments	"Dock-in" restricted Restricted to Enter	Shipowner should satisfy the gas-free criteria for Dock-in.
O2	Less than 19.0%			
CO2	More than 1.0%			
LPG	More than 0.095% Less than 0.19%	All cargo tank and adjacent compartments	"Dock-in "permitted Cold work permitted	Gas-free works after dock-in should be done by the Ship Recycling Facilities The Ship Recycling Facilities should maintain the CO2 and LPG contents as set forth in this column.
O2	More than 19.0% Less than 23.0%			
LPG	Less than 0.095%	Work compartment and adjacent compartment	Hot Work permitted	Adjacent work compartment should also be kept as set forth in this column.
O2	More than 19.0% Less than 23.0%			

For LN Gas

Gas	Gas Contents (Vol %)	Applicable to	Restriction	Remarks
LNG	More than 0.5%	All cargo tank and adjacent compartments	"Dock-in" restricted Restricted to Enter	Shipowner should satisfy the gas-free criteria for Dock-in.
O2	Less than 19.0%			
CO2	More than 1.0%			
LNG	More than 0.25% Less than 0.5%	All cargo tank and adjacent compartments	"Dock-in "permitted Cold work permitted	Gas-free works after dock-in should be done by the facilities The facilities should maintain the CO2 and LNG contents as set forth in this column.
O2	More than 19.0% Less than 23.0%			
LNG	Less than 0.25%	Work compartment and adjacent compartment	Hot Work permitted	Adjacent work compartment should also be kept as set forth in this column.
O2	More than 19.0% Less than 23.0%			

.4 gases in all compartment and tanks should be identified and their concentration should be checked by a competent person with a well calibrated gas detector to ensure that the concentration is within safe limitations;

.5 in a hot environment, even a small volume of oil tends to evaporate, and gases will accumulate in the enclosed or confined space. In order to prevent this from happening, ventilation should be ensured immediately after the acceptance of a ship by opening manholes, ventilators, doors, hatches and any additional ventilation holes;

.6 when residual oils in the pipelines on deck or in engine-room are removed, cold work should be done;

.7 when making additional ventilation holes on the shell plate, the gas level should be confirmed as sufficiently low before starting the work. Water spraying onto the shell plate is considered appropriate;

.8 enclosed compartments such as storage and cargo rooms should be kept open after the ship's arrival at the Ship Recycling Facility in order to prevent gas-accumulation;

.9 the gas concentration level of cargo tank should be checked every day, with special attention to heat and gas generation from gas cutting;

.10 before commencing the work inside enclosed and confined spaces, gas and oxygen concentration should be checked to prevent explosion;

.11 prior to the cutting work, remove all loose items (i.e. furniture, electric equipment, stationary, etc.) and flammable items (i.e. joiner works), as much as possible;

.12 the backside of hull plate on cutting line should be carefully examined utilizing the drawings and information about the arrangement of ship. Examination of the following flammable and/or smoke agents should be made:

- Insulations and linings of accommodation space;
- Oil tanks with residual oil, sludge or gas;
- Insulations for refrigerated storage;

- Hazardous Materials containing PCBs and/or TBT or highly flammable materials;
- Bilges in the engine-room;
- Pipelines containing oil and gas; and
- Galvanized Pipes and ducts.

.13 if these materials are found, preventive means against fire and explosion should be made by taking out these items from cutting line, pumping out oil or bilge, or set preventive covers against scattering of sparks;

.14 "Gas-Free for Hot Work" should be clearly marked with gas concentration and time and date of check as follows:

GAS-FREE FOR HOT WORK		
Name of Compartment/Tank		
Gas Concentration		
Date/Time Checked		
Authorization given from		

.15 powders, such as rocket signals or flares, should be carefully removed and safely stored;

.16 leakage of gas and oxygen from pipe lines, hoses, valves or cutting tools should be checked;

.17 fire extinguishers and fire buckets should be located properly near the workplace conducting hot work and their locations should be clearly indicated at the entrance of the ship. The proper operation, maintenance and regular inspection of all fire extinguishers and equipment should be conducted by a competent person;

.18 fire extinguishers should be suitable for oil and chemical fires and their proper functioning should be tested periodically; and

.19 noting that there may be delay of several hours after the hot work is finished and before a fire starts, post-work inspection should be arranged as necessary.

5.2 Prevention against damage to human health

5.2.1 Hazardous Materials to human health.

.1 When conducting cutting work by utilizing gas ("hot works"), special attention should be given to toxic fumes, smokes, and particles containing heavy metals which may be generated during the work. The Ship Recycling Facility should provide measures to mitigate negative impact to both environment and human health by providing respiratory protection;

.2 CO2 gas, Chlorofluorocarbons, CFCs (Freon) Gas, Ammoniac gas should be removed without discharging atmosphere;

.3 before commencing work inside the enclosed and confined spaces, oxygen concentration should be checked to avoid the shortage of oxygen;

.4 ventilation should properly be done before entering the tanks and/or confined spaces;

.5 before commencing work inside enclosed and confined spaces, gas and oxygen concentration levels should be checked to avoid the shortage of oxygen, suffocation and gas poisoning;

.6 all employees of the Ship Recycling Facility should have periodical medical examination; and

.7 for employees engaged in specific work such as removal of asbestos and PCBs and the cutting of steel plate with toxic paints, special medical examination may be necessary.

5.2.2 Prevention of slip and fall accidents

In order to protect workers from falling from elevated positions, the following precautionary measures should be taken:

.1 safety harnesses should be provided for and used by all workers working in elevated positions;

.2 the aerial work platforms should be used for the work in elevated position whenever possible;

.3 life jackets should be provided to and used by all workers working at sea or above water areas (i.e. water ballast tanks);

.4 manholes, holes for works and ventilation holes on the decks or horizontal girders should be clearly marked;

.5 appropriate ladders should be provided for access and egress from the workplaces. The upper end of the ladder should be secured to the structure;

.6 workers should not be on the block or in the vicinity of the block during the block is cut and falls down;

.7 safe passageways for the workers should be secured to prevent slip and fall accidents. The passage should be swept and kept clean;

.8 select appropriate cutting work zone on board where safe passageways and scaffoldings can be easily set up, utilizing the hull structure, such as main deck, horizontal girders;

.9 to enable the workers to safely cut the frames and/or longitudinal structures under the deck, provide hanging scaffoldings and arrange secure access to the underside of the deck;

.10 prepare ring hangers, holes, master ropes, etc., to set up scaffolding so that workers can safely work at hanging stage; and

.11 when cutting the upper part of the cargo oil tanks of a tanker or the deep tanks of a cargo ship, filling the water ballast in the tank up to approximately three "3" metres from bottom is effective to act as a shock absorber in case of slip and fall accident.

5.2.3 Prevention against dropping and scattering of objects

.1 lifting tools, (i.e. wire ropes, hooks, etc.,), should be checked, refurbished and kept in good condition;

.2 check the weight balance of the cut block, and the proper positioning of the lifting apparatus. Before lifting the block, check the tension to ensure that there is no excessive tension to a wire rope or lifting apparatus;

.3 remove any objects which may fall from the lifted block;

.4 all workers should remain clear of the area under the lifted block;

.5 avoid simultaneous works at upper and lower part of blocks, deck, internal structure of hold in order to prevent accidents due to the dropping of objects and/or fire sprays;

.6 tall blocks and equipment should not be placed on unstable surface;

.7 cut blocks, even small blocks, should not be placed on the top of other cut scraps; and

.8 protective fences should be provided to prevent scrap fragments and other materials from scattering into the workplaces.

5.3 Precautions against Spillage of Hazardous Materials

In line with the Inventory of Hazardous Materials provided, the Ship Recycling Facility should identify the type, volume, location, and form of Hazardous Materials including residual cargoes. Hazardous Materials should be treated as follows:

.1 Cargo residues: The risk is inherent in flammable, toxic or corrosive gases, residues and spilled materials. If there is evidence or suspicion that leakage of hazardous materials has occurred, appropriate preventive measures should be taken in accordance with the type of residual cargoes. To minimize such risk, Ship Recycling Facilities should assess the potential problems with competent persons and shipowner;

.2 Other Hazardous Materials: Hazardous Materials listed in the Inventory of Hazardous Materials should be treated in line with the guidelines prescribed in Section 6, "Control of Hazardous Materials"; and

.3 Wastes generated during recycling work: Generated waste during recycling work should be treated in line with the guidelines prescribed in Section 6, "Control of Hazardous Materials".

6 Safe and Environmentally Sound Management of Hazardous Materials

6.1 Hazardous liquids, residues and sediments (Oils, Bilge, Ballast water)

As regards the procedures for the removal of residual oils (fuels and lubricants), bilge, etc., reference should be made to Section 3.2.2.1 Tank cleaning and gas-free.

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

Oils and chemicals kept on board should be removed from ship and stored properly.

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

6.2 Heavy Metals (Lead, Mercury, Cadmium, Hexavalent chromium)

As indicated in the Inventory of Hazardous Materials, heavy metals are found in batteries, galvanized materials, level switches, gyro compasses, thermometer, etc. Radioactive substances are found in level indicators, and smoke detectors.

The equipment and other instruments containing those heavy metals should be removed carefully so as not to be broken and so as to avoid heavy metals to contaminate the environment. Reusable equipment and instruments should be stored properly. Broken equipment and instruments should be delivered to the designated company.

Anodes fitted to the ships' hull as sacrificed metal should be removed in the course of block cutting.

6.3 Paints and Coatings

The ship Recycling Facility should be informed of the paints and coatings that are highly flammable or that may release toxins during cutting, by the shipowner during the confirmation and delivery of the ship.

Removal procedures for paints and coating prior to the cutting of the blocks should refer to Section 3.2.3 Dismantling.

6.4 Asbestos and materials containing asbestos

In order to safely remove the asbestos and materials containing asbestos, the following procedures should be taken:

.1 there should be workers who are trained and authorized for the removal of asbestos;

.2 appropriate protections should be provided so as not to release the asbestos in the air (i.e. covering sheet, water spray, etc.);

.3 walls and ceilings containing sprayed asbestos should be carefully torn off;

.4 personal protection equipment (PPE) for workers, including aspiratory protection and special protective clothing, should be provided;

.5 removed asbestos including materials containing asbestos should be stored in properly labelled leak-proof containers exclusively made for transport; and

.6 asbestos should not be re-used or recycled. Final disposal should be in accordance with national regulations.

6.5 Polychlorinated Biphenyls (PCBs) and materials containing PCBs

Polychlorinated Biphenyls (PCBs) may be contained in the equipment and materials in both solid and liquid forms as shown on the Inventory of Hazardous Materials.

In order to safely remove the materials containing PCBs, the following procedures should be followed:

.1 there should be workers trained and authorized for the removal of PCBs;

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

.3 electric cable insulation containing PCBs should not be burnt; and

.4 removed PCBs should be stored in properly labelled, leak-proof containers exclusively made for transport.

6.6 CFCs and Halons

Chlorofluorocarbons, CFCs generally know as Freon, used in refrigeration plants, and Halons used in fire extinguishers, contribute to the depletion of the ozone layer. These Hazardous Materials should be treated by the authorized subcontractors and workers.

6.7 Other Hazardous Materials

Other Hazardous Materials not listed above and which are not part of the ship's structure, should be removed under safe conditions to the maximum extent possible prior to cutting.

7. Emergency Preparedness and Response Plan (EPRP)

7.1 General Requirement

.1 Emergency preparedness and response plan (EPRP) should be established and maintained in cooperation with external emergency services and other bodies (i.e. fire stations and hospitals), where applicable. The plan should identify the potential for accidents and emergency situations, and address the prevention of risks for human health and environment.

.2 EPRP should be developed in accordance with national regulations, considering the size and location of the Ship Recycling Facility.

.3 The Ship Recycling Facility should set up the responsible team for human injuries and environmental accidents with the assignment of the duties and responsibilities.

.4 EPRP should include the reporting system that ensures rapid notification in the event of an accident involving human injury and a pollution incident.

7.2 Equipment and Procedures

Emergency response equipment, i.e. first aid, fire fighting, storage and transport of chemicals, disposal and treatment of waste chemicals, rescue and resuscitation equipment, as required in accordance with national regulations, should be kept readily available at the Ship Recycling Facility. All workers should be informed of the location of these set of equipment and the procedure for using them. Workers should be trained for basic first aid and initial clean up of the contaminated area. This training programme should be made locally for each Ship Recycling Facility in accordance with national regulations.

In areas where the work involves the risk of intoxication by chemicals, fumes or smoke, insect bites or other specific hazards, training should be extended accordingly in consultation with an appropriately qualified person or organization.

7.3 Communication

A chain of command should be established to ensure that workers can be protected appropriately and the response to injuries and accidents can take place in the event of emergency as specified in the EPRP.

A coordinator should be selected to coordinate the work of the emergency response teams. The responsibilities of the coordinator(s) should include:

.1 assessing the situation and determining the necessity of activating the emergency procedures;

.2 acting to minimize the event (e.g. fire, explosion, spills), and exposure of workers;

.3 directing all efforts in the area, including evacuating personnel and minimizing the loss of property;

.4 ensuring the emergency response services, such as first aid and fire response; and

.5 providing the information to, and communication with, the relevant competent authorities, external emergency services and local community;

The latest information, as well as internal communication and coordination, should be provided to protect all persons in the event of an emergency at the worksite. Alarms should be capable of being seen and heard by everyone.

7.4 First aid

The Ship Recycling Facility should be responsible for ensuring that first aid, including the provision of trained personnel, is available. Arrangements should be made for ensuring the safe transport of persons for medical attention.

First-aid training should be repeated at regular intervals to keep the knowledge and skills.

Where the work involves risk of drowning, asphyxiation or electric shock, first-aid personnel should be proficient in the use of resuscitation and other life-saving techniques and in rescue procedures.

7.5 Response to human injuries

Based on the assessment of injuries, a procedure for response to injuries should be established including the following:

.1 first aid, such as eye flashing, cleansing of wounds and skin, and bandaging;

.2 reporting to a responsible person;

.3 transport of injured person for additional medical care;

.4 recording of incident (including identification of possible hazards); and

.5 investigation, determination and implementation of remedial action.

7.6 Response to environmental accidents

In case of spills of hazardous materials, the clean up of the contaminated area is normally required. However, for certain materials, the spill may require immediate evacuation of the area.

A spill-cleaning procedure which includes safe handling of spilled materials should be established.

The provision of relevant information and training to all personnel of the facility, at all levels, including regular exercises in emergency prevention, preparedness and response procedures should be ensured.

8. Worker Safety Training Programme

8.1 General

The required competence of individual workers should be defined by the top management of the Ship Recycling Facility based on the provisions of national regulations as appropriate. A training programme should be established and maintained to ensure that all workers are competent to perform their present or future duties and responsibilities safely.

Specific training needs should be identified during the initial and ongoing hazard identification and risk assessments.

8.2 Personal Protective Equipment (PPE) and Protective Clothing

.1 the facility should provide Personal Protective Equipment (PPE) and protective clothing:

.a in accordance with national regulations;

.b without cost to the workers; and

.c having regard to the type of work and risks.

.2 the Ship Recycling Facility should arrange that PPE and protective clothing are properly stored and maintained;

.3 the Ship Recycling Facility should provide the workers with the appropriate instructions on how to use them;

.4 use of the PPE should refer to the following instructions.

Body area	PPE	Body area	PPE
Ear	Hearing protection	Hand	gloves
Face	Face shield Heat protection	Foot	Safety toe shoes
Eye	Goggles, glasses Screen	Body	clothing
Respiratory organ	Dust Mask Respirator Air line mask Supplied air respirator Others	Head	Helmet

.5 use of PPE corresponding to the expected hazards during the recycling work are listed as follows. The Ship Recycling Facility should provide PPE taking these guidance into consideration; and

Body area	Hazards	PPE
Face and eye	General Hot work Chemical	Safety glasses Welding helmet with tinted glass Chemical goggles with face shield
Head	Elevated work Material handling Confined space	Helmet
Ear	High noise	Ear plugs, muff
Respiratory	Dust High concentrate mist Oxygen deficiencies of toxic gas	Dust mask Air supplied respirator Self-contained breathing apparatus
Hand and arms	General Hot Objects. Organic Solvents, Petroleum.	Leather gloves Leather, Heat Resistant Gloves Rubber, PVC, etc., Gloves
Feel and legs	General. Steam , Corrosive Liquids Chemicals	Safety Toe Shoes Safety Toe Boots Depending on Chemical
Body	Hot work Work at Elevated area Work at sea	Leather apron Safety harness Life jacket

.6 respirators, overalls, head coverings, gloves, tight-fitting boiler suits, impermeable footwear and aprons appropriate to the risks of radioactive contamination should be worn in areas where unsealed radioactive source are used.

8.3 Training programmes

8.3.1 General requirements

The training programme should:

.1 cover all members of the facility, as appropriate;

.2 be conducted by competent persons;

.3 provide effective and timely initial and refresher training at appropriate intervals;

.4 include participants' evaluation of their comprehension and retention of the training;

.5 be reviewed periodically by the safety and health committee, and modified as necessary; and

.6 be documented.

8.3.2 Contents of training programme

The contents of the training programme should be devised and implemented in consultation with workers or their representatives. Training should be in line with identified needs and the contents may include:

.1 the rights, responsibilities and duties of competent authorities, employers, contractors and workers;

.2 the nature and degree of hazards or risks to safety and health which may occur, including any factors which may influence that risk, such as hygiene practices;

.3 the correct and effective use of prevention, control and protection measures, especially engineering controls, and the worker's own responsibility for using such measures properly;

.4 operating procedures while working in confined spaces;

.5 correct methods for the handling of materials, the operation of equipment, and the storage, transport and disposal of waste;

.6 assessments, reviews and exposure measurements;

.7 the role of health surveillance, the rights and duties of workers in this regard, and access to information;

.8 instructions on PPE as may be necessary, their correct uses and limitations, and in particular factors which may show the inadequacy or malfunction of the equipment, and the measures which may be required for the workers to protect themselves;

.9 hazard warning signs and symbols for hazardous environmental factors which may occur;

.10 emergency measures, fire fighting and fire prevention, and first aid;

.11 appropriate hygiene practices to prevent, for example, the transmission of Hazardous Materials to the home or family environment;

.12 cleaning, maintenance, storage and waste disposal, to the extent that these may cause exposure for the workers concerned; and

.13 procedures to be followed in an emergency.

Training should be provided to all participants and take place during working hours. The management of the Ship Recycling Facility should ensure that training and information requirements and procedures are kept under review, and documented.

8.4 Qualification of managers and supervisors

Managers should be in possession of appropriate qualifications and training, or have gained sufficient knowledge, skills and experience to qualify on the basis of competence, to ensure that they are able to:

.1 plan and organize safe ship recycling operations, including identification of hazards, assessments of risks and the implementation of preventive measures;

.2 establish, implement and maintain an occupational safety and health management system;

.3 monitor the status of safety and health in those operations for which they are responsible; and

.4 take remedial action in the event of non-compliance with requirements.

8.5 Qualification, training and skills testing for workers

8.5.1 Competence of worker

Workers should be assigned to and only perform work for which they have the required level of skills, knowledge and training.

Managers should ensure that all workers, including subcontractors and their workers are:

.1 sufficiently educated and trained in the tasks to which they are assigned and possess any relevant certificates;

.2 suitably instructed in the hazards connected with their work and environment, as well as trained in the precautions necessary to avoid accidents and injuries to health;

.3 made aware of the relevant laws, regulations, requirements, codes of practice, instructions and advice relating to prevention of accidents and diseases;

.4 informed of their individual and collective responsibility for safety and health; and

.5 sufficiently instructed in the correct use and effects of PPE and its appropriate care, and has appropriate training made available to them.

8.5.2 Required level of worker

The required level of skill and knowledge should be defined and objectively assessed through skills testing. This procedure may be integrated with formal training or conducted at the worksite.

8.5.3 Training prior to assignment

Prior to initial assignment to a specific task all workers should undergo appropriate training. This training should have clearly defined learning objectives, be structured and be conducted by a qualified instructor. It should include:

.1 information about the purpose of the task and the methods and techniques to be used;

.2 information about safety and health hazards;

.3 use and maintenance of tools and machines;

.4 selection and use of any PPE; and

.5 assessment of performance for effectiveness and safety.

Training outcomes should be tested to make sure that workers are able to cope with the assigned task and acquire sufficient skill to perform it without endangering themselves, others or the working environment. Test results should be recorded, certified and documented.

* * *

APPENDIX 1

ILLUSTRATION OF FOUR (4) SHIP RECYCLING METHODS

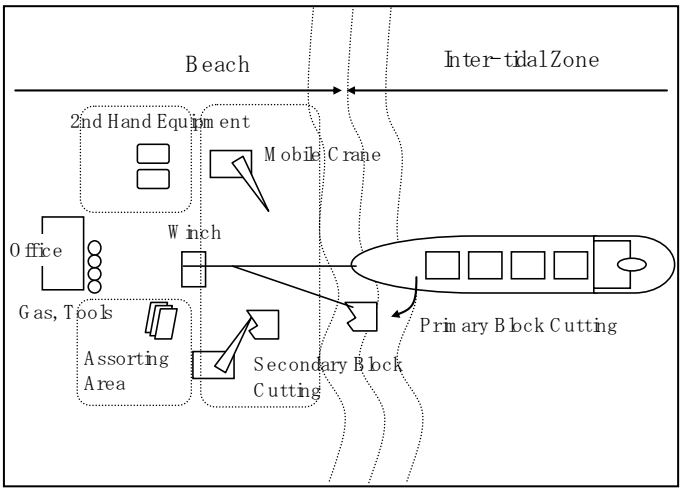
The followings are the illustrative explanation of the four types of ship recycling method which has been commonly used.

While these Guidelines are intended to provide for general guidance which are applicable to ship recycling regardless of the recycling method that is used in a ship recycling facility, this illustrative explanation is provided to assist the readers to understand the Guidelines by giving visual images of how actual ship recycling operation is being conducted.

It should be noted that the provisions of such explanation neither denies newly developed techniques for ship recycling nor exclude any other methods than these four (4) representative methods, as far as the method or technique is reasonably justified as environmentally sound and safe in accordance with the Guidelines.

.1 Beaching Method

"**Beaching Method**" is the method to demolish ships at grounded condition on the inter-tidal zone. In this method, ships are grounded by themselves to take advantage of difference in the tidal level. Steel blocks and/or other equipment are cut and fall down to the inter-tidal zone, and no wharf, jetty or quay is used for demolition.



Beaching Method may directly pollute the sea and shore if no protective measures are provided.

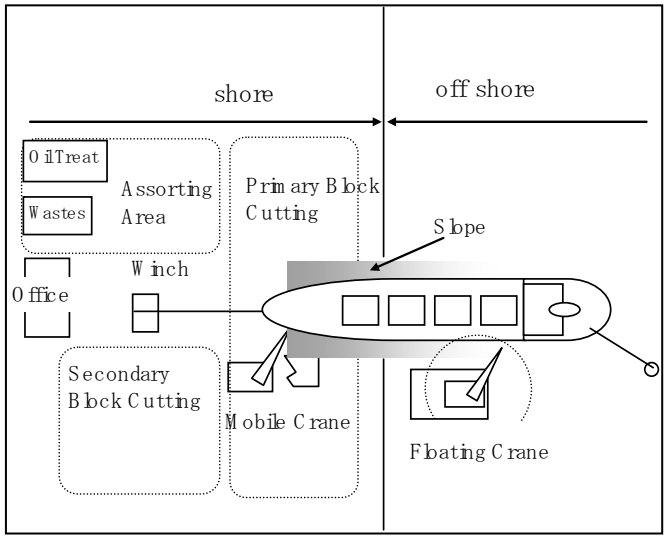
Workers on the inter-tidal zone may be sometimes exposed unsafe works

Since this method takes advantages of the natural topography, good facility to prevent negative impact to the environment should be required.

Therefore, stringent requirements on the management would be necessary. [Reference is made to the technical guidance and special precautions for beaching method at the end of Appendix 1.]

.2 Landing Method

"**Landing Method**" is the method used to demolish ships on shore. In this method, steel blocks or other equipment are cut on land or moved to secondary cutting areas on-land by cranes. No blocks or other equipment should be cut and fall down to the inter-tidal zone.



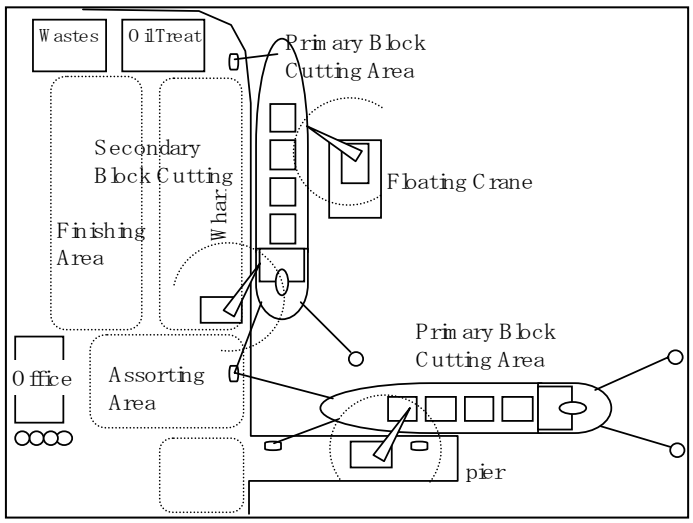
Landing Method may directly pollute the shore if no protective measures are provided.

Since this method applied the "wet dock" facility to prevent negative impact to the sea should be required.

The shoreside facilities can be improved easily.

.3 Afloat Method

"Afloat Method" is the method to demolish ships that are afloat and moored along wharfs, jetties or quays and/or moored offshore. In this method, steel blocks and/or other equipment are cut in afloat condition and moved to a secondary cutting area on land, wharf, jetty, or quay, by using cranes.



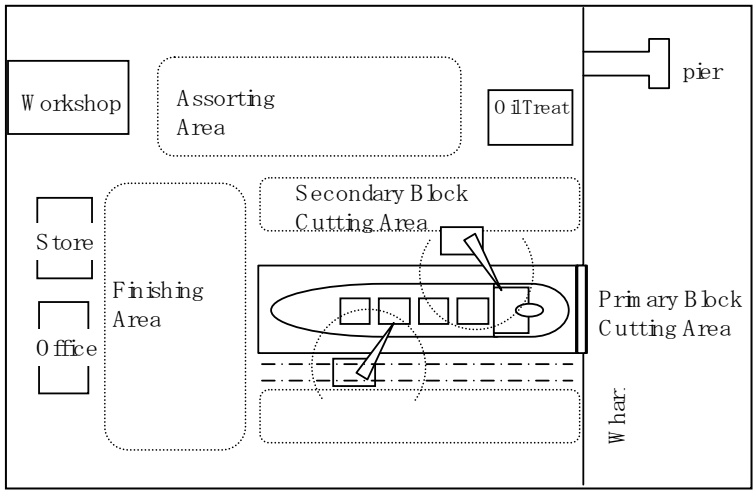
Afloat Method may pollute the sea if no protective measures are provided.

Since this method is carried out at the afloat condition special attention to control the ship's stability is required.

The shoreside facilities can be improved easily.

.4 Dry Method

"Dry-Method" is the method to demolish ships at a dry dock or a slipway which has a dock gate and an impermeable floor structure.



In this method, possible risk to the environment can be easily controlled and mitigated.

Shore facilities can be improved easily, however, maintenance of the dock is required periodically.

[Technical Guidance when beaching method is taken.]

[(Example)

- When a hull is grounded on the beach, appropriate oil reception and/or storage equipment should be installed adjacent to side hull in order to collect residual oil and solvents used for sludge and/or oil cleaning. Do not spill any oil into the sea.

- ….
- …..
- ….]

* * *

APPENDIX 2-1

WORKER SAFETY AND HEALTH COMPLIANCE PLAN
(to be developed)

APPENDIX 2-2

ENVIRONMENTAL COMPLIANCE PLAN
(to be developed)

APPENDIX 2-3

OPERATIONAL PLAN

Prior to proceeding to step-II, the following detailed Operational Plans should be developed based on the Inventory of Hazardous Materials, date and information collected with regard to the ship to be recycled.

The Operational Plan should follow, but not be limited to, the dismantling plan and hazardous materials removal and management plan.

I. Hazardous Materials Removal and Management Plan

The Hazardous Materials Removal and Management Plan should be developed individually for each ship and include removal procedures of chemical substances listed on Tables A and B in the Guidelines for the development of the Inventory of Hazardous Materials.

.1 The Removal Plan should include procedures for the removal of the Hazardous Goods listed in Tables C and D.

.2 After confirmation of step-I, identified hazardous materials should be properly removed in an environmentally sound and occupationally safe manner in line with the Ship Recycling Plan.

.3 Procedures for the removal, treatment and disposal of Hazardous Materials should follow Section 6. “Control of Hazardous Materials” of these Guidelines, and satisfy national regulations.

.4 The Plan should indicate the authorized subcontractors and workers handling Hazardous Materials (i.e. asbestos, PCBs) and specific facilities that are able to receive the Hazardous Materials (i.e. residual oils and bilge water).

.5 Confirm their position and quantity of all the hazardous materials listed in the Inventory List with the ship owner and decide their removal and treatment method in accordance with the format as shown on the table below.

Hazardous Materials Removal and Management Plan

<table>
<tr><td rowspan="2">Inventory List</td><td colspan="2">Table A</td><td colspan="2">Table B</td><td colspan="2">Table C</td><td colspan="2">Table D</td></tr>
<tr><td colspan="2">Asbestos
PCB
Ozone Depleting Substances
（TBT）</td><td colspan="2">Cadmium
Hex. Chromium Compounds
Lead
PBB、PBDF
Radioactive Substances
Chlorinated Paraffin's
Mercury</td><td colspan="2">Oil, Gas, Inventories
（refer to appendix C of the Inventory GL）</td><td colspan="2">Electrics
IT、Communication Equip
Consumable Equip
Lightings
Elect. tools
Furniture, etc.</td></tr>
<tr><td rowspan="4">Part I
Material contained in structure and equipment of the ship</td><td>No.</td><td>Removal Method</td><td>No.</td><td>Removal Method</td><td colspan="2" rowspan="4"></td><td colspan="2" rowspan="4"></td></tr>
<tr><td></td><td></td><td></td><td></td></tr>
<tr><td></td><td></td><td></td><td></td></tr>
<tr><td></td><td></td><td></td><td></td></tr>
<tr><td rowspan="2">Part II
Operationally generated wastes</td><td colspan="2" rowspan="2"></td><td colspan="2" rowspan="2"></td><td>No.</td><td>Removal Method</td><td colspan="2" rowspan="2"></td></tr>
<tr><td>1,2
E/R Bilge</td><td>Pumping、Oil Treatment</td></tr>
<tr><td rowspan="2">Part III
Stores</td><td colspan="2" rowspan="2"></td><td colspan="2" rowspan="2"></td><td>No.</td><td>Removal Method</td><td>No.</td><td>Removal Method</td></tr>
<tr><td></td><td></td><td></td><td></td></tr>
</table>

Notice: No, expressed on the table is correspondent to the no. of the Inventory List

II. Dismantling Plan

The Dismantling Plan should be made on an individual basis, taking into account the size and type of ship. The Dismantling Plan should include but not limited to the following: mooring plan, cutting plan, and workforce deployment plan The "Dismantling Plan" should indicate the necessary reference to the "Ship Recycle Plan (SRP)" when the dismantling is in progress.

.1 The Dismantling Plan should set forth work plan based on the information acquired at the confirmation of the ship's condition and prior investigation of the ship type, hull shape and condition in order to avoid possible risks to the workers i.e. falling of block or hull, slippage of articles and others. The demolition work should be done in accordance with this plan.

.2 The Dismantling Plan should set forth the following items:

a. method and order of the work;

b. type and capacity of the machines and equipment to be utilized (refer to (10) Heavy Lifting Plan, chapter 3. Workers Safety Plan);

c. set restricted areas, and method to avoid accidents by falling blocks or slippage of worker; and

d. the Facility should notify all relative workers when provide this dismantling plan.

.3 Basic Reminders of during Demolition Work

a. working area is prohibited to enter other persons than the workers engaging the work;

b. in case the workers may endanger with windy, heavy rain or snow condition, the work should be stopped; and

c. use appropriate rope, bags for lifting up or down tools, equipment on board. Do not throw them.

2.1 Mooring Plan

.1 The mooring arrangement for the ship at the Ship Recycling Facility should be determined by taking into account the following information:

- the zone should have enough draft to accommodate ship with trim;
- provide winches, mooring ropes, wire ropes and other necessary equipment to pull up the hull blocks safely from the sea bed (Do not move heavy objects by manually);
- provide buoys, anchors and other equipment necessary to fix the ship as needed; and
- provide bitts, winches, mooring ropes, wire ropes and other equipment necessary to moor the ship to the shore/wharf/quay.

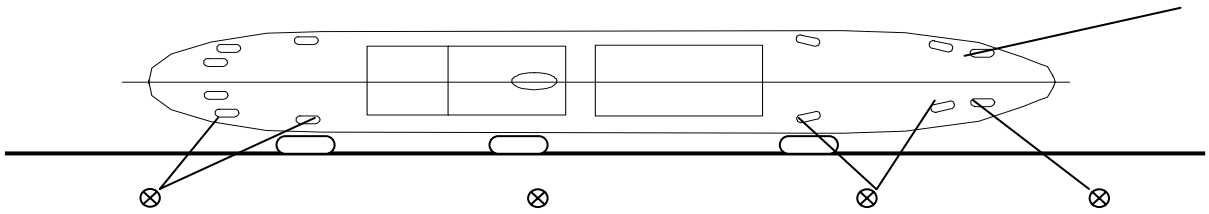
.2 The mooring arrangement for the ship should be made in accordance with the following conditions and indicated on the drawing with arrangement of mooring ropes as shown on the figure next:

- cranes (floating, mobile, crawler) capacity and their working area(sea and shore);
- wharf or pier conditions (size, water depth);

- depth of sea area and tidal height (high and ebb); and
- draft of ship.

.3 Ship to be demolished may affect wind pressure since it is at light weight. Therefore, when a typhoon or windy condition is expected, examine reinforcement of the mooring arrangement and avoid that ship to be drifted, capsized, or sunk.

Mooring Plan(Example) Dock in/Alongside the Quay date: Tide:

Ship Name			
Type of Ship			
Class(Applied regulation)			
Particulars	Los × B(mld)×D(mld)× d Tonnage (GT, DWT) Main Engine, Generator, Other auxiliary machines		
Quay	Length	Draft	Mooring apparatus
Cranes Maximum Capa. Outreach			
Mooring Arrangement 			

2.2 Cutting Plan

.1 Hull cutting plan should be made based on the maximum capacity of the lifting gear and other conditions of the Facility and also decide cutting order taking fire, stability, trim, etc., into consideration as follows:

- Hot work prohibited area;
- Area with sprayed insulations on the steel plate;

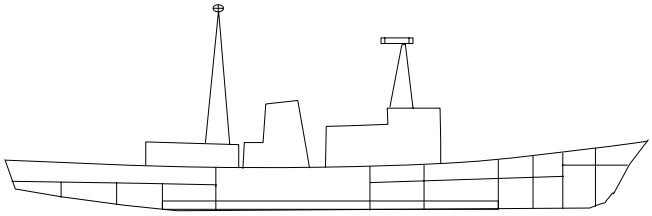
- Reusable material and materials to be disposed;
- Sequence of the large equipment removal; and
- Trim, draft and stability of the hull.

.2 Cutting plan of the hull should be indicated as shown on the table below, and manage progress of the work, trim and stability of the hull and safety of work.

Cutting Plan (example)

SRP Hull Cutting Plan 961.24GT LDT.

SCHEDULE	1W	2W	3W	4W	5W	6W	7W	8W	9W	10W	TOTAL
Weight / Vol from Ship		60	90	140	130	150	150	130	130	50	1,030
Cutting Part / Vol from Yard		60	70	140	130	140	140	120	120	40	960
Preparatory Works	←	→									
Residual Oil, Cleaning, Gas Free	←	→									
Remove Hazardous Materials	←	→									
Remove Asbesots, ACMs		←	→								
Deck Machineries		30	→								
Super Structure, Accomodation		30	→								
Above Water line: Focsl Deck, FP Tank			20	→							
Above Water line: Stern Const. Engine Const (Funnel)				20	40	40	50	30			
Above Water line: Engine Room Machieries					30	30	20				
Above Water line: Accomodationm Tanks			(DECK) (SHELL & BHD.)	60	60 (No.2)	40	80 (No.3)	100 (No.4)	30		
Bottom Construction			50 (F.P.T. & NO.1)	60		30 (FWD PART OF NO.2)			30	60 50	



2.3 Workforce Deployment Plan

.1 Workers deployment plan should be made and checked daily including workers, subcontractors, other specific contracted workers such as expert for asbestos removal.

.2 Workers deployment plan should clearly indicate with workplace, name of workers and their leader, etc.

Workers Deployment Plan

1. Name of the Ship
2. Work Period
3. Works and Worker Deployment

		Day/Week	1	2	3	4	5	6	7	
Primary Cutting		Compartment	Up Dk 1 →							
		Works	Side Shell cutting →							
		Worker Deployment	A group →							
			B group			→				
		Remarks								
Subcon Consignee		Compartment								
		Works								
		Worker Deployment								
Secondary Cotting		Secodary								
		Finishing								
		Shering								
		Others								
Sorting & Transportation										
Delivery of Products & H.M.										
Other Works										

* * *

APPENDIX 3

TECHNICAL CONDITIONS OF SHIP RECYCLING FACILITY AND EQUIPMENT

1. Mooring Zone/Primary Cutting Zone

Mooring Arrangement

Common Guidance
• Provide winches, mooring ropes, wire ropes and other necessary equipment to secure the hull to be stable while recycling and to pull up the hull blocks to the designated zone (Do not move heavy objects manually) • The zone should have enough water depth to accommodate ship with trim • When ship is in an afloat condition, provide buoys, anchors and other equipment necessary to fix the ship as needed

Other Facilities and Equipment

Common Guidance	Ship in a dock/slipway
• Provide work boat for the purpose of extending the oil boom and monitoring the environment. • Provide oil booms in preparation for oil spill incident • Appropriate fire extinguisher and/or fire-fighting water should be provided adjacent to the workplace and should be always functionable. • The ship's hull itself may be used as impermeable containment or drainage storage facility to prevent contaminants from being released to the environment.	• The dock bed should be of an impermeable floor, and be structured so that fallen objects can be recovered. • Provide the oil boom properly around the dock gate

2. Secondary Cutting Zone and Finishing Zone

Common Guidance
• The area, quay, wharf, dock, etc., for the secondary cutting puopose should be flat and have enough ground strength to prevent an accident where a large block or heavy equipment falls down. • Provide appropriate measures underneath the cutting line (e.g., steel plates) to prevent Hazardous Materials from falling to the ground. • Provide appropriate measures (impermeable floor or oil pans with enough depth) to prevent blocks and/or equipment containing Hazardous Materials, which might easily infiltrate the soil (such as oil and PCBs.), from being placed directly on the ground • This area should be monitored in accordance with Section 4.2, "Construction of Surface of Facilities", Section 4.2.3., "Mud and Soil Control" and Section 4.3., "Drain Control" of these Guidelines. • Provide adequate fire-fighting equipments and/or fire-fighting water that is suitable for Hazardous Material contained in the blocks and/or the equipment to be cut. • Supply line of oxygen, gas, air, water and electric power should be protected from the accidental falling of heavy blocks and/or heavy machinery.

3. Assorting and Storage Zone

Common Guidance
• Provide appropriate measure (impermeable floor or oil pans with enough depth) to prevent blocks and/or equipments containing Hazardous Materials, which might easily infiltrate the soil (such as oil and PCBs.) from being placed directly on the ground. • This area should be monitored in accordance with Section 4.2., "Construction of Surface of Facilities", Section 4.2.3., "Mud and Soil Control" and Section 4.3., "Drain Control" of these Guidelines • Hazardous Materials which might easily infiltrate the soil (such as oil and PCBs.) should be properly stored in areas protected from rain and wind. • Storage for the removed Asbestos and ACMs should be independently provided with the appropriate protection to scatter to the air.

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ANNEX 3

OUTLINE OF DRAFT GUIDELINES
FOR THE SAFE AND ENVIRONMENTALLY SOUND RECYCLING OF SHIPS

1.0 MANAGEMENT PLAN

- 1.1 Company Information
  - 1.1.1 Organizational Structure
  - 1.1.2 Key Personnel
  - 1.1.3 ESH Management Programme and Policy Statement
- 1.2 Workforce and Training Programme
- 1.3 Personnel and Subcontractor Management
- 1.4 Records Management
- 1.5 Past Performance

2.0 OPERATIONAL PLAN

- 2.1 Facility Information
  - 2.1.1 Layout of the Facility
  - 2.1.2 Infrastructure
  - 2.1.3 Equipment
  - 2.1.4 Permits, Licences, Certifications
  - 2.1.5 Dismantling Operations, Capability and Approach
  - 2.1.6 Security Measures
- 2.2 Vessel Pre-Arrival Management
  - 2.2.1 Ship Recycling Plan (SPR) Development
  - 2.2.2 Notification of Intent to Accept a Ship
  - 2.2.3 Towing Operations
  - 2.2.4 Vessel Afloat Monitoring Procedures
- 2.3 Vessel Arrival Management
  - 2.3.1 Mooring
  - 2.3.2 Stability and Flood Prevention
  - 2.3.3 Security Measures
  - 2.3.4 Severe Weather Measures
- 2.4 Ship Dismantling Methodology
  - 2.4.1 Initial Survey and Evaluation
  - 2.4.2 Stability and Afloat Monitoring Procedures
  - 2.4.3 Cutting Operations and Gas-Free for Hot Works Procedures
  - 2.4.4 Production Flow and Segregation of Materials
  - 2.4.5 Final Hull Dismantling
  - 2.4.6 Reporting at Completion of Ship Recycling

3.0 WORKER SAFETY AND HEALTH COMPLIANCE PLAN

- 3.1 Regulatory Framework and Compliance Procedures
  - 3.1.1 Statement of Determination
  - 3.1.2 Key Safety and Health Personnel
  - 3.1.3 Job Hazard Assessment
  - 3.1.4 Safety and Health Training
  - 3.1.5 Personnel and Subcontractor Management
  - 3.1.6 Incident/Accident Reporting Procedures
  - 3.1.7 Substance Abuse Policies
- 3.2 Operations and Processes
  - 3.2.1 Diving Operations
  - 3.2.2 Confined and Enclosed Spaces
  - 3.2.3 Welding, Cutting, Grinding, and Heating
    - 3.2.3.1 Gas-Free for Hot Works Programme
  - 3.2.4 Drums, Containers, and Pressure Vessels
  - 3.2.5 Scaffolds, Ladders, Workman Aloft, Other Working Surfaces
    - 3.2.5.1 Fall Protection Programme
  - 3.2.6 Gear and Equipment for Rigging and Material Handling
  - 3.2.7 Housekeeping and Illumination
  - 3.2.8 Tool and Equipment Maintenance and Decontamination
    - 3.2.8.1 Lock Out/Tag Out Programme
  - 3.2.9 Health and Sanitation
  - 3.2.10 Communication of Hazards
    - 3.2.10.1 Signage
  - 3.2.11 Personal Protective Equipment
    - 3.2.11.1 Respiratory Protection Programme
    - 3.2.11.2 Hearing Conservation Programme
  - 3.2.12 Emergency Preparedness and Response
  - 3.2.13 Fire Prevention and Protection
  - 3.2.14 Worker Exposure and Medical Monitoring
    - 3.2.14.1 Asbestos Programme
    - 3.2.14.2 Lead and Other Heavy Metals Programme
    - 3.2.14.3 Blood Borne Pathogen
- 3.3 Prevention of Accidents
  - 3.3.1 Gas-Free for Hot Works
  - 3.3.2 Safe Entry Procedures
  - 3.3.3 Accident Prevention Procedures
  - 3.3.4 Pollution Prevention Procedures
- 3.4 Emergency Preparedness and Response Plan
- 3.5 Fire Prevention and Response Plan

4.0 ENVIRONMENTAL COMPLIANCE PLAN

4.1 Regulatory Framework and Compliance Procedures
- 4.1.1 National and International Requirements
- 4.1.2 Permits, Licences, Certifications
- 4.1.3 Environmental Monitoring
- 4.1.4 Incident and Spills Reporting Procedures
- 4.1.5 Notification

4.2 Hazardous Materials Management

- 4.2.1 Asbestos
  - 4.2.1.1 Identification and Integration with dismantling
  - 4.2.1.2 Potential Onboard locations
  - 4.2.1.3 Sampling and Analysis, protocols and test methods
  - 4.2.1.4 Handling, Removal, Remediation
  - 4.2.1.5 Storage and Labelling
  - 4.2.1.6 Treatment, Transportation, Disposal

- 4.2.2 PCBs
  - 4.2.2.1 Identification and Integration with dismantling
  - 4.2.2.2 Potential Onboard locations
  - 4.2.2.3 Sampling and Analysis, protocols and test methods
  - 4.2.2.4 Handling, Removal, Remediation
  - 4.2.2.5 Storage and Labelling
  - 4.2.2.6 Treatment, Transportation, Disposal

- 4.2.3 Fuels and Oils
  - 4.2.3.1 Identification and Integration with dismantling
  - 4.2.3.2 Potential Onboard locations
  - 4.2.3.3 Sampling and Analysis, protocols and test methods
  - 4.2.3.4 Handling, Removal, Remediation
  - 4.2.3.5 Storage and Labelling
  - 4.2.3.6 Treatment, Transportation, Disposal

- 4.2.4 Bilge/Ballast Water
  - 4.2.4.1 Identification and Integration with dismantling
  - 4.2.4.2 Potential Onboard locations
  - 4.2.4.3 Sampling and Analysis, protocols and test methods
  - 4.2.4.4 Handling, Removal, Remediation
  - 4.2.4.5 Storage and Labelling
  - 4.2.4.6 Treatment, Transportation, Disposal

- 4.2.5 Heavy Metals
  - 4.2.5.1 Identification and Integration with dismantling
  - 4.2.5.2 Potential Onboard locations
  - 4.2.5.3 Sampling and Analysis, protocols and test methods
  - 4.2.5.4 Handling, Removal, Remediation
  - 4.2.5.5 Storage and Labelling
  - 4.2.5.6 Treatment, Transportation, Disposal

4.2.6 Paints and Coatings
- 4.2.6.1 Identification and Integration with dismantling
- 4.2.6.2 Potential Onboard locations
- 4.2.6.3 Sampling and Analysis, protocols and test methods
- 4.2.6.4 Handling, Removal, Remediation
- 4.2.6.5 Storage and Labelling
- 4.2.6.6 Treatment, Transportation, Disposal

4.2.7 Waste Water/Sludge
- 4.2.7.1 Identification and Integration with dismantling
- 4.2.7.2 Potential Onboard locations
- 4.2.7.3 Sampling and Analysis, protocols and test methods
- 4.2.7.4 Handling, Removal, Remediation
- 4.2.7.5 Storage and Labelling
- 4.2.7.6 Treatment, Transportation, Disposal

4.2.8 Ozone Depleting Substances
- 4.2.8.1 Identification and Integration with dismantling
- 4.2.8.2 Potential Onboard locations
- 4.2.8.3 Sampling and Analysis, protocols and test methods
- 4.2.8.4 Handling, Removal, Remediation
- 4.2.8.5 Storage and Labelling
- 4.2.8.6 Treatment, Transportation, Disposal

4.2.9 Other Materials
- 4.2.9.1 Identification and Integration with dismantling
- 4.2.9.2 Potential Onboard locations
- 4.2.9.3 Sampling and Analysis, protocols and test methods
- 4.2.9.4 Handling, Removal, Remediation
- 4.2.9.5 Storage and Labelling
- 4.2.9.6 Treatment, Transportation, Disposal

4.3 Spill Prevention, Control, and Countermeasures Plan

4.4 Storm Water Pollution Prevention Plan

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