RESOLUTION MEPC.173(58)

Adopted on 10 October 2008

GUIDELINES FOR BALLAST WATER SAMPLING (G2)

THE MARINE ENVIRONMENT PROTECTION COMMITTEE,

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

RECALLING ALSO that the International Conference on Ballast Water Management for Ships held in February 2004 adopted the International Convention for the Control and Management of Ships' Ballast Water and Sediments, 2004 (the Ballast Water Management Convention) together with four Conference resolutions,

NOTING that regulation A-2 of the Ballast Water Management Convention requires that discharge of ballast water shall only be conducted through ballast water management in accordance with the provisions of the Annex to the Convention,

NOTING FURTHER that article 9 of the Ballast Water Management Convention provides that a ship to which the Convention applies may, in any port or offshore terminal of another Party, be subject to inspection by officers duly authorized by that Party for the purpose of determining whether the ship is in compliance with this Convention. Such an inspection is limited to, *inter alia*, a sampling of the ship's ballast water, carried out in accordance with the guidelines to be developed by the Organization,

NOTING ALSO that the International Conference on Ballast Water Management for Ships, in its resolution 1, invited the Organization to develop Guidelines for uniform application of the Convention as a matter of urgency,

HAVING CONSIDERED, at its fifty-eighth session, the draft Guidelines for ballast water sampling (G2) developed by the Ballast Water Review Group,

1.   ADOPTS the Guidelines for ballast water sampling (G2) as set out in the Annex to this resolution;

2.   INVITES Governments to apply the Guidelines as soon as possible, or when the Convention becomes applicable to them; and

3.   AGREES to keep the Guidelines under review.

ANNEX

DRAFT GUIDELINES FOR BALLAST WATER SAMPLING (G2)

1   INTRODUCTION

1.1   The objectives of these Guidelines are to provide Parties, including port State control officers, with practical and technical guidance on ballast water sampling and analysis for the purpose of determining whether the ship is in compliance with the Ballast Water Management Convention (the Convention) according to article 9 "Inspection of Ships". These Guidelines only address general technical sampling procedures, and do not address legal requirements.

1.2   These Guidelines provide general recommendations for ballast water sampling by port State control authorities. Guidance on sampling procedures for use by Parties in assessing compliance with regulations D-1 or D-2 is given in the annex to these Guidelines.

1.3   Sampling by port State control or other authorized officers, should seek to use methods that are (a) safe to the ship, inspectors, crew and operators; and (b) simple, feasible, rapid and applicable at the point of ballast discharge.

1.4   The time needed for analysis of samples shall not be used as a basis for unduly delaying the operation, departure, or movement of the vessel. Article 12 of the Convention applies. Additionally, the use of validated automated systems for ballast water sampling and analysis should be explored when the developments of such systems are sufficiently progressed.

2   BACKGROUND

2.1   Sampling requirements for compliance control of regulations D-1 and D-2 of the Convention will differ as these two regulations have significantly different parameters. Sections 2.2 and 2.3 below reproduce the text contained in the Convention.

2.2   Ballast water exchange standard (D-1)

2.2.1   Ships performing ballast water exchange in accordance with regulation D-1 of the Convention shall do so with an efficiency of at least 95 per cent volumetric exchange of ballast water.

2.2.2   For ships exchanging ballast water by the pumping-through method, pumping through three times the volume of each ballast water tank shall be considered to meet the standard. Pumping through less than three times the volume may be accepted provided the ship can demonstrate that at least 95 per cent volumetric exchange is met.

2.3   Ballast water performance standard (D-2)

2.3.1   Regulation D-2 of the Convention refers to two size categories of organisms and a group of indicator microbes. Ships conducting ballast water management in accordance with regulation D-2 shall discharge:

.1   less than 10 viable organisms per cubic metre greater than or equal to 50 micrometres in minimum dimension;

.2   less than 10 viable organisms per millilitre less than 50 micrometres in minimum dimension and greater than or equal to 10 micrometres in minimum dimension; and

.3   discharge of the indicator microbes shall not exceed:

(i)   Toxicogenic *Vibrio cholerae* (O1 and O139) with less than 1 colony forming unit (cfu) per 100 millilitres or less than 1 cfu per 1 gramme (wet weight) zooplankton samples;

(ii)   *Escherichia coli* less than 250 cfu per 100 millilitres; and

(iii)   Intestinal *Enterococci* less than 100 cfu per 100 millilitres.

3   DEFINITIONS

3.1   For the purpose of these Guidelines, the definitions as stated in the Convention apply and:

.1   "Minimum Dimension" means the minimum dimension of an organism based upon the dimensions of that organism's body, ignoring e.g., the size of spines, flagellae, or antenna. The minimum dimension should therefore be the smallest part of the "body", i.e. the smallest dimension between main body surfaces of an individual when looked at from all perspectives. For spherical shaped organisms, the minimum dimension should be the spherical diameter. For colony forming species, the individual should be measured as it is the smallest unit able to reproduce that needs to be tested in viability tests.

.2   "Sampling Point" means that place in the ballast water piping where the sample is taken.

.3   "Sampling Facilities" means the equipment installed to take the sample.

4   SAMPLING FOR COMPLIANCE WITH THE BALLAST WATER EXCHANGE STANDARD (REGULATION D-1)

4.1   In-tank samples may be taken via sounding or air pipes and manholes by using pumps, sampling bottles or other water containers. Samples may also be taken from the discharge line.

4.2   Sampling the ballast water on arriving ships may provide information on compliance with regulation B-4 of the Convention by analysing their physical and/or chemical parameters. However, it is difficult to use indicator (physical/chemical) parameters in isolation to conclusively prove that ballast water exchange either has or has not occurred to the D-1 Standard. As with any analytical procedures or techniques used to test for compliance with regulation B-4, methods used to test for compliance with ballast water exchange requirements should be rigorously validated and widely distributed through the Organization.

5   SAMPLING FOR COMPLIANCE WITH THE BALLAST WATER PERFORMANCE STANDARD (REGULATION D-2)

5.1   Although the Convention contains no requirements for provision of sampling points, the Guidelines for approval of ballast water management systems (G8) adopted by resolution MEPC.174(58) do expressly call for the provision of sampling facilities, not only for the purpose of type approval, but also for the purpose of these ballast water sampling Guidelines (refer to paragraphs 3.2, 3.8, and section 8 of the Guidelines for approval of ballast water management systems (G8) for further detail regarding provision of sampling facilities).

5.2   Samples should be taken from the discharge line, as near to the point of discharge as practicable, during ballast water discharge whenever possible.

5.3   In cases where the ballast system design does not enable sampling from the discharge line, other sampling arrangements may be necessary. Sampling via manholes, sounding pipes, or air pipes is not the preferred approach for assessing compliance with regulation D-2. Scientific trials have shown that using these sampling locations may not provide accurate estimates of organism concentrations that would occur in the discharge, i.e. such sampling may provide an under- or over-estimate of the concentration of organisms.

5.4   In-tank sampling should only be used if ballast water treatment occurs on uptake prior to or whilst ballast water is in the tank. If any part of the treatment process occurs during the ballast water discharge, then in-tank sampling will be inappropriate.

5.5   In light of these potential shortcomings, sampling to determine compliance with regulation D-2 should, whenever practicable to do so, be carried out in the discharge line near the discharge point.

5.6   An exception to this is the case when tanks are emptied through direct overboard discharge valves, as in upper side wing tanks, rather than through the ballast pumps. In such cases, tank sampling may be an appropriate approach.

6   BALLAST WATER SAMPLING AND ANALYSIS

6.1   In accordance with article 9 of the Convention, a Party may sample the ship's ballast water for the purpose of determining whether the ship is in compliance with the Convention in accordance with these Guidelines.

6.2   Any sampling protocol for testing of compliance with the Convention should observe the following principles to help ensure consistency of approach between Parties and to provide certainty to the shipping industry:

      .1   the sampling protocol should be in line with these Guidelines;

      .2   the sampling protocol should result in samples that are representative of the whole discharge of ballast water from any single tank or any combination of tanks being discharged;

.3 the sampling protocol should take account of the potential for a suspended sediment load in the discharge to affect sample results;

.4 the sampling protocol should provide for samples to be taken at appropriate discharge points;

.5 the quantity and quality of samples taken should be sufficient to demonstrate whether the ballast water being discharged meets with the relevant standard;

.6 sampling should be undertaken in a safe and practical manner;

.7 samples should be concentrated to a manageable size;

.8 samples should be taken, sealed and stored to ensure that they can be used to test for compliance with the Convention;

.9 samples should be fully analysed within test method holding time limit using an accredited laboratory; and

.10 samples should be transported, handled and stored with the consideration of the chain of custody.

6.3 Prior to testing for compliance with the D-2 standard, it is recommended that, as a first step, an indicative analysis of ballast water discharge may be undertaken to establish whether a ship is potentially compliant or non-compliant. Such a test could help the Party identify immediate mitigation measures, within their existing powers, to avoid any additional impact from a possible non-compliant ballast water discharge from the ship.

6.4 In emergency or epidemic situations, port States may use alternative sampling methods which may need to be introduced at short notice and should endeavour to communicate these to ships entering ports under their jurisdiction. Although in such situations they may not necessarily notify the Organization, such notification could be beneficial for other Parties.

6.5 Alternative sampling measures instigated as a result of paragraph 6.4 should give due cognizance to the requirements of article 12 of the Convention.

6.6 Given the complexity in ballast water sampling and analysis, it is likely that new approaches will be developed for ballast sampling and analyses of the composition, concentration, and viability of organisms. Administrations are encouraged to share information concerning methods for the analysis of ballast water samples, using existing scientific reports, and papers distributed through the Organization.

6.7 The Organization should make available, through any appropriate means, information communicated to it regarding ballast water sampling and analysis.

6.8 Further guidance on the interpretation of the results arising from sample analysis will be developed by the Organization in due course.

Annex

This annex provides practical recommendations regarding sampling techniques and procedures for use by Member States and port State control and other authorized officers assessing compliance with regulation D-1 or D-2.

PART 1   SAMPLING FROM THE BALLAST WATER DISCHARGE LINE
PART 2   SAMPLING FROM BALLAST WATER TANKS
PART 3   SAMPLING AND ANALYSIS PROTOCOLS
PART 4   SAMPLE DATA FORMS
PART 5   HEALTH AND SAFETY ASPECTS
PART 6   RECOMMENDATION FOR A PORT STATE CONTROL BALLAST WATER
             SAMPLING KIT
PART 7   MAINTENANCE, STORAGE, LABELLING AND TRANSPORTATION
PART 8   CHAIN OF CUSTODY RECORD

PART 1 – SAMPLING FROM THE BALLAST WATER DISCHARGE LINE

1   The advantage in sampling the biota present in the ballast water discharge line is that this is most likely to accurately represent the concentration of substances and organisms in the actual discharge, which is of primary concern in assessing compliance with the discharge regulations.

2   The disadvantages of this method are that, on most ships, in-line sampling should be carried out in the engine room, where space may be limited, and the handling of water once the samples were concentrated may be impracticable.

3   In order to undertake an accurate measurement on the organism concentration in the ballast water, it is recommended to install an "isokinetic" sampling facility. Isokinetic sampling is intended for the sampling of water mixtures with secondary immiscible phases (i.e. sand or oil) in which there are substantial density differentials. In such conditions, convergence and divergence from sampling ports is of significant concern. Since most organisms are relatively neutrally buoyant, true isokinetic sampling is unnecessary. However, the mathematics related to isokinetic sampling are deemed to be useful as a basis for describing and specifying sampling geometries. Isokinetic sampling is necessary to ensure that a sample contains the same proportions of the various flowing constituents as the flow stream being sampled. During isokinetic sampling the sampling device does not alter the profile or velocity of the flowing stream at the moment or point at which the sample is separated from the main flow stream. Under isokinetic conditions, the velocities of both the sample and the main flow are equal at the point at which the sample is separated from the main flow. To achieve isokinetic sampling conditions, a sampler is designed to separate a subsection of the total flow-stream in a manner that does not encourage or discourage water entry other than that which is otherwise in the cross-section of the sampler opening. In other words, flow streams in the main flow of the pipe should not diverge or converge as they approach the opening of the sampler.

4   Technical specifications for design of in-line sampling facilities

4.1   Through computational fluid dynamics modelling, it has been shown that the isokinetic diameter calculation can provide guidance for sizing of sample ports for sampling of organisms.

Simulations showed that flow transitions from the main stream were best for sample port diameters between 1.5 and 2.0 times the isokinetic diameter. Ports sized in this range had smooth transitions and pressure profiles that allowed for direct sampling without the need of a pump to induce sample collection. The isokinetic sample port diameter should therefore be determined generally according to the equation:

$$Diso = Dm\sqrt{Qiso/Qm}$$

where Diso and Dm are the diameters of the sample port opening and the main flow in the discharge line, respectively; and Qiso and Qm represent the respective volumetric flow rates through the two pipes. It is recommended that sample port size be based on the combination of maximum sample flow rate and minimum ballast flow rate that yields the largest isokinetic diameter.

4.2   The opening of the sampling pipe should be chamfered to provide a smooth and gradual transition between the inside and outside pipe diameters.

4.3   The length of the straight sample pipe facing into the flow can vary, but should not usually be less than one diameter of the sampling pipe. The sampling port should be oriented such that the opening is facing upstream and its lead length is parallel to the direction of flow and concentric to the discharge pipe which may require sampling pipes to be "L" shaped with an upstream facing leg if installed along a straight section of discharge pipe.

4.4   The need to be able to service the sample pipe is important and should be considered, taking the safety of ship into consideration. Therefore, the sampling pipe should be retrievable either manually, or mechanically, or it should be in a system which can be isolated. Because of the potential for the opening and interior of the sample pipe to become occluded by biological or inorganic fouling, it is recommended that samplers be designed to be closable at the opening, removed between sampling intervals or be easily cleaned prior to sampling.

4.5   The sample pipe and all associated parts of the sampler that come into contact or near proximity with the ballast piping should be constructed of galvanically compatible materials and generally corrosion resistant. Any corrosion of the sampling system will affect sample flow rates and potentially sample representativeness.

4.6   If flow control of the sample flow rate is required, ball, gate and butterfly valve types should be avoided as they may cause significant shear forces which may result in organism mortality. For flow control, it is recommended that diaphragm valves or similar valve types be used to minimize sharp velocity transitions. For flow distribution, ball valves may be utilized in such a manner that they are either fully open or fully closed.

5   **Technical specifications for installation of a sample point in the ballast water discharge line**

5.1   The sample taken should be removed from the main pipeline at a location where the flowing stream at the sample point is representative of the contents of the stream. The sample facility should be placed at a point where the flow in the main pipe is fully mixed and fully developed.

5.2   The sampling point should be installed in a straight part of the discharge line as near to the ballast water discharge overboard as practicable. The sampling facility should be positioned such that a representative sample of ballast water is taken. It is recommended that the position of the sample point is established using methods such as computational fluid dynamics.

PART 2 – SAMPLING FROM BALLAST WATER TANKS

1   In-tank sampling may be appropriate for assessing D-1 compliance. There may be circumstances when in-tank sampling to provide an indication of compliance or non-compliance with the ballast water performance standard D-2 may be found appropriate. D-2 compliance should be assessed at ballast water discharge, whenever this is possible.

2   Manholes

2.1   Sampling of ballast water via manholes allows direct access to ballast tanks and ballast holds.

2.2   The disadvantages of this type of sampling access include the need for opening and closing manholes and hatches. Further, overlaying cargo may prevent access for sampling. Also, hatches and horizontal openings inside tanks are not aligned one below the other, which means that although the tank may have three or more decks, only the top deck may be accessible for sampling. Further, in some ships, access hatches and vertical openings are on the side of the tank and thus are not accessible unless the tank is empty. Another disadvantage is ladders and platforms may inhibit access to the full depth of the tank. Sampling from some certain parts of the ballast water tank may result in a lack of representation of the whole ballast water discharge.

2.3   Samples should be collected using scientific sampling equipment including plankton nets and pumps, as appropriate, for the sampling and analytical method intended for use.

2.4   Whenever possible samples should be taken from multiple water depths inside the ballast tank.

2.5   When employing plankton nets:

.1   the sample should be taken in a vertical net haul from the deepest sampling point accessible in the tank;

.2   all plankton nets should be lowered to the maximum accessible depth inside the ballast tank and retrieved at a speed of approximately 0.5 m/s; and

.3   multiple vertical net hauls may be needed to meet the required sample volume. The water volume sampled may be measured by flow meters in the opening of the net or by noting the sampling depth and net opening diameter.

2.6   When employing pumps:

.1   pump intake pipes should be lowered to multiple depths (if possible) for different samples to obtain a vertical sample; and

.2   the water volume sampled may be measured by flow meters in the hose or by using larger containers to measure the pumped water volume.

3   Sounding pipes or air pipes

3.1   Sampling by sounding pipes, when available, could be appropriate due to accessibility. However, there are some limitations when using this point to test for compliance. The use of sounding pipes will be more effective when the ship's sounding pipes are perforated along their length, ensuring better mixing of ballast water and that within the sounding tube. However, care must be taken if initial water samples from a sounding pipe indicate no or insufficient exchange even though the ship's records document otherwise. Experience has shown that in some cases water within unperforated sounding pipes is not affected during an exchange. This may occur during flow-through because the water in pipes is not exposed to the mixing within the tank. This may also occur during empty refill when water in the sounding pipes is held within the pipe by vacuum pressure while the tanks are drained and then filled.

3.2   Samples should be collected using scientific sampling equipment as appropriate.

4   Use of pumps

4.1   Pumps of various types may be used to sample via sounding or air pipes.

4.1.1   The use of pumps may be limited by inability to overcome the pumping head, i.e. when the vertical distance from the pump to the water level in tank exceeds 10 metres, suction pumps cannot be used.

4.1.2   Pump intake pipes should be lowered to multiple depths (if possible) for different samples to obtain a vertical sample. The water volume sampled may be measured by flow meters in the hose or by using larger containers to measure the pumped water volume.

4.2   In principle, intrinsically safe pumps should be used in all circumstances.

4.3   Pumps that do not contribute to the mortality of organisms should be preferred.

PART 3 – SAMPLING AND ANALYSIS PROTOCOLS

1   The sample volume and number of samples required will depend upon:

   .1   the objective of sampling, e.g., to determine the number of organisms in different size classes; to assess the viability of organisms in different size classes; or to assess compliance with the D-1 or D-2 standard;

   .2   the specific analytical method to be used; and

   .3   the statistical significance and certainty required.

2   Sample handling and storage will also vary depending on the objectives and specific analytical methods. In particular the way the sample is taken (e.g., net or pump) and the conditions in which it is stored (e.g., light, temperature, storage container) should be appropriate for the analytical method used.

3   Sample analysis methods are rapidly developing and the best available procedures should be used consistently with availability.

4   The sampling and analysis methodologies to test for compliance with the Convention are still in development. Although significant technical advances and refinements have been made in these areas since the adoption of the Convention, there are still numerous issues to be resolved. Administrations are still undertaking research to define the most appropriate methods to test for compliance, and the best way to take, handle and analyse samples.

5   At the present time, there are no specific sampling or analysis protocols that can be recommended for Administrations to use. However, it is expected that in due course this information is likely to become available once full compliance testing regimes are developed and Administrations have had time to gain experience and develop best practice in ballast water sampling and analysis.

6   An IMO circular will be developed as a high-priority matter, to provide sampling and analysis protocols to be followed and give advice on the uniform application of these protocols. Such a circular will be updated when new protocols are developed.

7   To aid this process, Administrations are requested to supply information on any scientifically validated sampling and analysis techniques to the Organization, as soon as possible.

PART 4 – SAMPLE DATA FORM

The following minimum information is recommended for sample documentation:

Sampling date	
Ship particulars	**Name of ship:** Distinctive number or letters Port of registry: Gross tonnage: IMO Number: Date of construction: Ballast water capacity:
Identification of sampled tank[*]	
Type and position of sampled tank[*]	
Capacity of sampled tank[*]	(m³)
Type of ballast water management undertaken	(type of exchange or treatment)
Make of ballast water management system	
Date of ballast water management undertaken	
Sample identification code	(including number of replicate)
Sample type	(larger, smaller plankton, microbes)
Sampling techniques used	net (including depth of vertical net haul, net opening size, mesh size) pumps (including sampling depth, pumping capacity in l/min.) bottle (incl. sampling depth, bottle capacity in l.) specify other sampling technique if used
Sampling time/start	
Sampling end time	
Origin of water sampled[*]	(lat/lon/port)

[*]   If appropriate.

Type of sampling access point	
Location of sampling access point	
Water volume sampled	(by volume)
In case sample is concentrated on board specify filter or net sizes (if applicable)	(μm)
Preservative (if used)	
Transport to laboratory	cooling container, dark storage, etc.
Sample results	

[*]   If appropriate.

Other information as necessary should be included in the table.

PART 5 − HEALTH AND SAFETY ASPECTS

1   As shipboard and port State control procedures on health and safety aspects already exist there is no need to develop new procedures for the purpose of ballast water sampling. In general, ship procedures, especially for entry into enclosed spaces, shall be followed if more stringent than national regulations. However, the following paragraphs provide some additional guidance.

2   Worker health and safety should be a primary consideration during all the sampling operations as ships and ports are hazardous environments in which to work. Any sampling operation should be undertaken after consideration of the specific risks associated with the ballast water being sampled. Appropriate personal protective equipment connected with the work should be worn as necessary.

3   In the event sampling involves entry into confined spaces, Recommendations for entering enclosed spaces aboard ships (resolution A.864(20)) and relevant IACS Recommendations on confined space safe practice (www.iacs.org.uk), and standard industry practice on man entry into enclosed spaces should be consulted (e.g., ISGOTT).

4   All electrical equipment, including torches, should be intrinsically safe for use on board ships when required. Safety limitations on the use of mobile telephones, etc., should always be observed. Standard industry practice on the use of electrical equipment including mobile telephone should be consulted (e.g., ISGOTT).

5   All electrical equipment to be used aboard should be checked to ensure that it is intrinsically safe. Pumps in particular should be fitted with waterproof junctions at the point where the electrical lead passes into the pump body and all plugs should be waterproof with rubber casings. If there is any doubt about an electrical supply or equipment aboard a vessel, advice from the ship's master or a member of the port company electrical staff should be sought.

PART 6 − RECOMMENDATION FOR A PORT STATE CONTROL BALLAST WATER SAMPLING KIT

1   The sampling kit for discharge line sampling should in minimum consist of:

• net or sieve to concentrate sample (with replacement material of identical mesh size);

- at least two containers to measure water volume extracted from discharge line. The container is further needed to collect sieved water for rinsing sieve or net when sampling is completed;

- water appropriate for rinsing net or sieve;

- funnel to ease filling of sample container;

- sample containers including sterile containers for microbial analysis;

- all necessary forms including sample data reporting/chain of custody forms;

- toolkit to enable net or sieve replacement, etc.;

- tape to seal the sample jar lid to the jar; and

- first aid kit.

2   The sampling kit for manhole sampling should in minimum consist of:

- plankton net with an associated flow meter – scientific trials have shown that plankton nets equipped with a cone shaped opening and filtering cod-end provide the most accurate samples. Nets to be lowered down into the tank should further not exceed 1 m in length and 30 cm in diameter to reduce the risk to become entangled inside the tank. A spare net including an extra cod end should be added to the sampling kit in case damages occur. A weight (minimum 1 kg) should be used to keep the wire vertical during the net haul;

- rope to lower down net (the rope should be metered to document net haul depth);

- net or sieve to concentrate sample (with replacement material of identical mesh size) spare sieves with identical mesh size should be added to the sampling kit in case damages occur;

- collecting sieved water for rinsing sieve and plankton net when sampling is completed;

- water bottle to rinse net or sieve;

- funnel to ease filling of sample container;

- sample containers including sterile containers for microbial analysis;

- all necessary forms including sample data reporting/chain of custody forms;

- toolkit to enable net or sieve replacement, etc.;

- tape to seal the sample jar lid to the jar; and

- first aid kit.

3   The sampling kit for sounding or air pipe sampling should in minimum consist of:

•   pump (e.g., suction, power or air driven);

•   hose (optional with weight to ease lowering down the hose);

•   net or sieve to concentrate sample (with replacement material of identical mesh size);

•   at least two containers to measure water volume pumped on deck. The container is further needed to collect sieved water for rinsing sieve when sampling is completed and to rinse hose;

•   water bottle to rinse net or sieve;

•   funnel to ease filling of sample container;

•   sample containers including sterile containers for microbial analysis;

•   all necessary forms including sample data reporting/chain of custody forms;

•   toolkit to enable net or sieve replacement, opening of sounding or air pipes, etc.;

•   tape to seal the sample jar lid to the jar; and

•   first aid kit.

PART 7 – MAINTENANCE, STORAGE, LABELLING AND TRANSPORTATION

1   Samples should be handled and stored as appropriate for the intended analytical method. The sample collection data form and chain of custody record should be kept with each individual sample.

2   Sample Sealing: Tape should be used to seal the sample jar lid to the jar.

3   Sample data forms: Prior to the beginning of the sampling programme, a suitable set of recording forms based on part 4 should be designed which incorporate all the sample information required to meet the aims of the programme. Details of each sample should be entered on the forms as soon as practicable.

4   Labelling of sample containers: Each sample container should be labelled by, e.g., using a waterproof permanent marker and additional vegetal paper which may be deposited inside the sample container, if appropriate. The information recorded should include but not be limited to the date, ship name, sample identification code, tank numbers and preservative if used. Codes may be used for some of these details as long as they are included on the sample data forms.

PART 8 – CHAIN OF CUSTODY RECORD

1   In the context of compliance control, it is advisable to maintain chain of custody records for the samples collected.

2   Information to be included should contain a complete record of those handling the sample from the time of the sampling onwards.

3   The chain of custody should also include date, ship identification, sample identification code, and a list of people who have handled the sample, including the person who takes the sample, dates and time, and the reason for sample transfer and the integrity of the sample on transfer.

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