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PREVENTION OF AIR POLLUTION FROM SHIPS

Draft Guidelines on the Ship Energy Management Plan (SEMP)

Submitted by Japan and the United States

SUMMARY

Executive summary:	The second intersessional Meeting of the Working Group on Greenhouse Gas Emissions from Ships (GHG-WG 2) invited submissions on the draft Ship Energy Management Plan to MEPC 59. Taking into account the decisions, as well as views expressed at GHG-WG 2, this document provides draft Guidelines on the Ship Energy Management Plan
Strategic direction:	7.3
High-level action:	7.3.1
Planned output:	7.3.1.1 and 7.3.1.3
Action to be taken:	Paragraph 3
Related documents:	GHG-WG 2/2/2, GHG-WG 2/4, GHG-WG 2/4/1 and MEPC 59/4/2

1 The second Intersessional Meeting of the Working Group on Greenhouse Gas Emissions from Ships (GHG-WG 2) considered a management tool on energy efficiency for ships. The group agreed that the Ship Energy Management Plan (SEMP) should be established through the establishment of voluntary guidelines. Taking into account the discussion and the proposals by Japan, ICS, *et al*., and the United States, the Working Group Chairman presented a proposed framework for the SEMP concept, which outlines that a SEMP should be established in four steps: planning, implementation, monitoring and self-evaluation and improvement (annex 4 to document MEPC 59/4/2). The Working Group agreed with the concept and invited interested Member Governments and observers to submit SEMP proposals based on this concept to MEPC 59 (paragraph 4.7 of document MEPC 59/4/2).

2 Considering the agreement made at GHG-WG 2, Japan and the United States have developed Draft Guidelines on the SEMP, as set out in the annex to this document.

Action requested of the Committee

3 The Committee is invited to consider the draft Guidelines on the SEMP and take action as appropriate.

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ANNEX

DRAFT GUIDELINES ON THE SHIP ENERGY MANAGEMENT PLAN

General

1 The purpose of a Ship Energy Management Plan (SEMP) is to establish a mechanism for a company and/or a ship to improve the energy efficiency of a ship's operation. Preferably, the ship-specific SEMP is linked to a broader corporate energy management policy for the company that owns, operates or controls the ship, recognizing that no two shipping companies or shipowners are the same, and that ships operate under a wide range of different conditions.

Concept of the SEMP

2 The SEMP should be developed as a ship-specific plan by the shipowner, operator or any other party concerned, e.g., charterer. The SEMP seeks to improve a ship's energy efficiency through four steps: *planning*, *implementation*, *monitoring*, and *self-evaluation and improvement*. These components play a critical role in the continuous cycle to improve ship energy management. With each iteration of the cycle, some elements of the SEMP will necessarily change while others may remain as before.

Planning

3 Planning is the most crucial stage of the SEMP, in that it primarily determines both a baseline[1] of ship energy usage and the expected improvement of ship energy efficiency. Therefore, it is encouraged to devote sufficient time to planning so that the most appropriate, effective and implementable plan can be developed.

Ship-specific measures

3.1 Recognizing that there are a variety of options to improve efficiency – speed optimization, weather routeing and hull maintenance, for example – and that the best package of measures for a ship to improve efficiency differs to a great extent depending upon ship type, cargoes, routes and other factors, the specific measures for the ship to improve energy efficiency should be identified in the first place. These measures should be listed as a package of measures to be implemented, thus providing the overview of the actions to be taken for that ship.

3.2 During this process, therefore, it is important to determine and understand the ship's current energy usage baseline. The SEMP then identifies energy-saving measures have been undertaken, and determines how effective these measures are in terms of improving energy efficiency. The SEMP also identifies what measures can be adopted to further improve the energy efficiency of the ship. It should be noted, however, that not all measures can be applied to all ships, or even to the same ship under different operating conditions and that some of them are mutually exclusive. Ideally, initial measures could yield energy (and cost) saving results that then can be reinvested into more difficult or expensive efficiency upgrades identified by the SEMP.

3.3 Guidance on Best Practices for Fuel-Efficient Operation of Ships developed by the Organization can be used to facilitate this part of the planning phase. Also, in the planning process, particular consideration should be given to minimize any onboard administrative burden.

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[1] "Baseline" in these guidelines means the current status of energy usage of a particular ship for which an SEMP is going to be developed, and it is the starting point to which any improvement in the future should be compared. It is not related to the "baseline" being discussed in the context of the EEDI.

Company-specific measures

3.4 The improvement of energy efficiency of ship operation does not necessarily depend on single ship management only. Rather, it may depend on many stakeholders including ship repair yards, shipowners, operators, charterers, cargo owners, ports, and traffic management services. For example, "Just in time" – as explained in 1.4.5 of "Guidance on Best practice for Fuel Efficient Operation of Ships" (annex to document GHG-WG 2/4/1) – requires good early communication among operators, ports and traffic management service. The better coordination among such stakeholders is, the more improvement can be expected. In most cases, such coordination or total management is better made by a company rather than by a ship. In this sense, it is recommended that a company also establish an energy management plan to manage its fleet (should it not have one in place already) and make necessary coordination among stakeholders.

Human resource development

3.5 For effective and steady implementation of the adopted measures, raising awareness of and providing necessary training for personnel both on shore and on board are an important element. Such human resource development is encouraged and should be considered as an important component of planning as well as a critical element of implementation.

Goal setting

3.6 The last part of planning is goal setting. It should be emphasized that the goal setting is voluntary, that there is no need to announce the goal or the result to the public, and that neither a company nor a ship is subject to external inspection. The purpose of goal setting is to serve as a signal which involved people should be conscious of, to create a good incentive for proper implementation, and then to increase commitment to the improvement of energy efficiency. The goal can take any form, such as the annual fuel consumption or a specific target of Energy Efficiency Operational Indicator (EEOI). Whatever the goal is, the goal should be measurable and easy to understand.

Implementation

Establishment of implementation system

4 After a ship and a company identify the measures to be implemented, it is essential to establish the responsible system for implementation of the identified and selected measures by developing the procedures for energy management, by defining tasks and by assigning them to qualified personnel. Thus, SEMP should contain the descriptions of the implementation system such as how each measure should be implemented and who the responsible person(s) is. The development of such a system can be considered as a part of *planning*, and therefore may be completed at the planning stage.

Implementation and record-keeping

4.1 The planned measures should be carried out in accordance with the predetermined implementation system. Record-keeping for the implementation of each measure is beneficial for self-evaluation at a later stage and should be encouraged. In addition, if some measure cannot be implemented for any reason, such reason and alternative measures that were taken, if any, should be recorded.

Monitoring

Monitoring tools

5 The energy efficiency of a ship should be monitored quantitatively. This should be done by an established method, preferably by an international standard. The EEOI developed by the Organization is one of the internationally established tools to obtain a quantitative indicator of energy efficiency of a ship and/or fleet in operation, and can be used for this purpose. Therefore, EEOI could be considered as the primary monitoring tool, although other quantitative measures also may be appropriate.

5.1 If used, the EEOI should be calculated in accordance with the guidelines developed by the Organization. If deemed appropriate, a Rolling Average Index of EEOI values should be calculated to monitor energy efficiency of the ship over time.

5.2 In addition to the EEOI, if convenient and/or beneficial for a ship or a company, other measurement tools can be utilized. In the case where other monitoring tools are used, the concept of the tool and the method of monitoring may be determined at the planning stage.

Establishment of monitoring system

5.3 It should be noted that whatever measurement tools are used, continuous and consistent data collection is the foundation of monitoring. To allow for meaningful and, consistent monitoring, the monitoring system, including the procedures for collecting data and the assignment of responsible personnel, should be developed. The development of such a system can be considered as a part of *planning*, and therefore should be completed at the planning stage.

Self-evaluation and improvement

6 *Self-evaluation and improvement* is the final phase of the management cycle. This phase should produce meaningful feedback for the coming first stage, i.e. planning stage, of the next improvement cycle.

6.1 The purpose of self-evaluation is to evaluate the effectiveness of the planned measures and of their implementation, to deepen the understanding on the overall characteristics of the ship's operation such as what types of measures can/cannot function effectively and how and/or why, to comprehend the trend of the efficiency improvement of that ship, and to develop the improved SEMP for the next cycle.

6.2 For this process, procedures for self-evaluation of ship energy management should be developed. Furthermore, self-evaluation should be implemented [annually] by using data collected through monitoring. In addition, it is recommended to invest time in identifying the cause-and-effect of the performance during the evaluated period for the better improvement plan. Such an improvement plan should be the basis of the next planning stage.

Voluntary reporting/review

7 Some shipowners/operators may wish to make public the results of the actions they have taken in their SEMP and how those actions have impacted the efficiency of their ship(s). These efforts should be incentivized as voluntary reporting and review, which could have a number of benefits. Some national Administrations, ports, or partnerships may wish to recognize the efforts of these leading shipowners/operators. For example, some ports now offer environmentally-differentiated harbour fees or other rewards to those ships that qualify as "green" and a growing number of consumer products companies increasingly utilize only verifiably green transportation options in moving their products to market. Such a proposed framework is complementary to and can easily co-exist with currently successful national and international energy efficiency and emissions reductions programmes outside IMO.

- *A sample form of SEMP is presented in the appendix for illustrative purpose.*

APPENDIX

SHIP ENERGY MANAGEMENT PLAN

Name of Vessel:		GRT:	
Vessel Type:		Capacity:	

Date of Development:		Developed by:	
Implementation Period:	From: Until:	Implemented by:	
Planned Date of Next Evaluation:			

1 MEASURES

Energy Efficiency Measures	**Implementation** (including the starting date)	**Responsible Personnel**	**Energy Saving Target**
Weather Routeing	<Example> Contracted with [Service providers] to use their weather routeing system and start using on trial basis as of 1 July 2012.	<Example> The master is responsible for selecting the optimum route based on the information provided by [Service providers].	<Example> [2.0]% from 2011 average (before the system introduction).
Speed Optimization	While the design speed (85% MCR) is 19.0 kt, the maximum speed is set at 17.0 kt as of 1 July 2012.	The master is responsible for keeping the ship speed. The log book entry should be checked every day.	[15%] from 2011 average.

2 MONITORING

- Description of monitoring tools

3 GOAL

- Measurable goals

4 EVALUATION

- Procedures of evaluation

[5 Organizational chart for implementation]

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