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FURTHER TECHNICAL AND OPERATIONAL MEASURES FOR ENHANCING ENERGY EFFICIENCY OF INTERNATIONAL SHIPPING

Mandatory Operational Efficiency Standards: Should the IMO pursue development of fleet-wide operational efficiency standards?

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SUMMARY

Executive summary:	This document offers views and raises outstanding policy questions relating to proposals before the Committee to develop mandatory fleet-wide operational efficiency standards.
Strategic direction:	7.3
High-level action:	7.3.2
Planned output:	7.3.2.1
Action to be taken:	Paragraph 17
Related documents:	MEPC 66/4/6, MEPC 65/4/19, and MEPC 65/4/30

Introduction

1 This document is submitted in accordance with the provisions of paragraph 6.12.5 of the Guidelines on the Organization and method of work of the Maritime Safety Committee and the Marine Environment Protection Committee and their subsidiary bodies.

Background

2 The MEPC has recently discussed proposals to consider collecting specific vessel data on a global basis. The co-sponsors support collection of fuel consumption data and other appropriate and limited information as this will provide better information concerning fuel consumed in the sector and will help efforts to estimate CO_2 emissions generated by the fleet.

3 Two proposals have been made to the Committee to date which recommend that the IMO proceed with a process to develop legally-binding, fleet-wide operational efficiency standards. A third proposal recommends the creation of a mandatory scheme to reduce annual fuel oil consumption of each ship and is referred to as the Fuel Oil Reduction Strategy or FORS.

4 The first two proposals made by Japan and the United States (see MEPC 65/4/19 and MEPC 66/4/6) call for the collection of ship specific data relating to fuel consumption, distance traveled, operating hours, and other parameters. Both proposals clearly state that the purpose of the data collection is to support development of legally-binding, fleet-wide operational efficiency standards. Because these proposals are not simply proposals calling

for the collection of vessel data, but proposals calling for the development of mandatory vessel operational efficiency standards, the co-sponsors believe that a number of important policy questions warrant consideration by the Committee.

Efficiency Standards in the Transportation Sector

5 There is a long and well-established record of national standards in the transportation sector whose purpose is to enhance the energy efficiency of specific vehicle fleets. Vehicle energy efficiency standards and emission standards have been established for newly-built trucks, cars, locomotives, ships, and aircraft. In the international arena, the IMO has demonstrated its leadership in this field with the development and adoption of specific energy efficiency design index (EEDI) standards for new ships across all of the major ship classes. Discussions are underway as well in the International Civil Aviation Organization (ICAO) to develop efficiency standards for aircraft, but these discussions are again focused on design standards applicable to new aircraft.

6 Fuel efficiency standards and air emission regulations are generally focused on new vehicles, ships, locomotives, and aircraft due to the fact that significant advances in fuel efficiency and technology are, as a general matter, most effectively applied through new technology, engine design, and improved hull form or vehicle design. As a general rule, governments have focused regulations on energy efficiency *design* standards while consciously and deliberately avoiding the application of fuel economy standards on an *operational* basis. Operational standards introduce a tremendous degree of regulatory complexity; there are a host of factors that can affect fuel consumption, including discretionary factors that involve commercial considerations, safety issues, and uncontrollable external variables that include, but are not limited to, varying weather conditions, sea state, currents, type of cargo carried and cargo volumes in different trade lanes.

7 How a ship is operated under a particular charter arrangement may also have a significant impact on that ship's fuel consumption and its operational efficiency under a particular charter contract. For example, if the ship is required to operate at a given speed (fast or slow), the fuel consumption and resulting operational efficiency index value may be lower or higher, but the fuel consumption and the "operational efficiency" obtained under the specific charter contract may have little relevance to subsequent operations under a different contract or operation in a different trade. Another ship may operate in a trade lane that is subject to adverse currents and more severe weather conditions than those encountered by a sister ship operating in different conditions. In this example, the first vessel may consume significantly more fuel, but the higher fuel consumption has nothing to do with an inadequacy of design or operational practice. These examples are another reason why regulatory authorities have found it productive to establish design efficiency standards rather than operational efficiency standards in the transport sector as well as in other industrial sectors, including standards applicable to housing and other energy-dependent products.

8 From a public policy perspective, fuel efficiency in the maritime sector is already impressive from a ton/mile, TEU/mile, or carbon per unit "transport work" basis. As has been noted many times in the IMO, maritime transport is the most carbon efficient form of goods movement today and is rapidly becoming even more energy efficient as the result both of market forces and of regulatory actions already taken by the IMO.

9 The recently adopted EEDI standards mandate increasing energy efficiency in the design of new vessels in all the major vessel classes. As a result of these regulations as well as commercial considerations, we are now seeing many new ships that are 10 to 30% more efficient than the ships they are replacing, and per unit transport efficiency is improving significantly in many trades.

10 Marine fuel sulphur limits under MARPOL Annex VI -- both the 0.1% sulphur limit required in Emission Control Areas (ECAs) as of January 2015, and the global 0.5% sulphur limit that may be implemented in 2020 or 2025 -- are already driving additional innovation in ship design and fuel efficiency. These fuel standards will continue to drive even greater efficiency improvements and reduced carbon emissions as the associated cost increases of these low sulphur fuels begin to impact operations around the globe. To illustrate the magnitude of the costs associated with the global sulphur limits to be implemented in 2020 or 2025, fuel costs in the maritime sector have been estimated to increase by roughly US$ 75 to 100 billion per year[1] (an increase of roughly 45 to 62%) as a result of the price differential between HFO and compliant low-sulphur fuels.

11 As we approach the new ECA sulphur standards applicable in 2015 and the global sulphur limits scheduled for implementation in 2020 or 2025, incentives to improve vessel energy efficiency only increase in magnitude. In 2020 or 2025 the geographic scope of these incentives will expand to all marine transportation activities around the globe. These marine fuel standards were established by the IMO for the purpose of reducing ships' sulphur emissions, but the much higher price of compliant fuel will certainly have the effect of increasing energy efficiency and reducing the industry's carbon emissions. These consequences need to be understood and recognized in the current debate concerning vessel efficiency. The Committee should consider whether mandatory operational standards could be expected to exceed improvements that are being made today and will continue to be made in response to the Annex VI rules and other pressures to minimize cost.

12 If one compares the cost of complying with the low-sulphur fuel standards that have been mandated by Annex VI with the costs of complying with the various "market-based mechanisms" that the IMO has previously considered to address carbon emissions, but not adopted, the Annex VI change to low sulphur marine fuels will introduce a "price-signal" into the marine market that is roughly 6 to 10 times greater in magnitude than many of the levy/fees or carbon prices discussed for several years in this Committee. The commercial impacts of these changes in daily operating costs will be extremely significant. In short, the regulatory and market incentives for enhanced fuel efficiency in the maritime market are already high, and the incentives will increase dramatically in the immediate future because of decisions the IMO has already made and because of on-going market forces.

Important Policy Questions Require Consideration and Debate within the Committee

13 The sponsors of this paper support efforts underway in the Committee to improve the state of knowledge concerning ship emissions and support discussions underway to identify ship data that would enable the Organization to better understand CO_2 emissions from the fleet. We also have supported the Committee's efforts to mandate improvements to the energy efficiency design of the world's fleet as a direct and practical focus to addressing carbon emissions in the maritime sector.

14 A number of fundamental policy questions arise with proposals to develop mandatory operational efficiency standards. The sponsors believe that the Committee would be well served by a full discussion and debate of these questions.

[1] The estimated U.S. $75-100 billion in additional annual fuel costs is derived from an estimate of the maritime industry's annual consumption of roughly 250 million tonnes of HFO multiplied by a differential cost of $300 to $400 dollars per metric ton of HFO and lower-sulphur distillates or blends. The base case uses a cost of U.S. $650 per tonne of HFO. Actual cost burdens will depend on future price changes for specific fuel blends as well as overall fuel consumption.

15 The co-sponsors also respectfully suggest that, if the Committee is to consider the development and application of vessel operational efficiency regulations by the IMO, a full and thoughtful discussion of the following questions should be undertaken before considering possible formulas or metrics to estimate operational performance.

Key Policy Questions for Discussion:

- Does the Committee consider the incentives to improve efficiency that already exist in the marine market and that have already been established by regulation to be too low or otherwise inadequate?

- Is there reason to believe that standards regulating operational fuel efficiency would produce efficiency gains that would not otherwise occur as a result of future economic incentives and regulations introduced through MARPOL Annex VI (e.g., cost of low-sulphur fuels in 2015, 2020/2025, and the EEDI)?

- Given that governments generally have not found it appropriate to create operational efficiency standards for road, rail, and aviation operations, why would application of vessel operational efficiency regulations be appropriate in the maritime sector?

- If the IMO were to create mandatory operational efficiency standards, how would one avoid creating a de-facto slow-steaming *speed limit* when one considers that many of the major vessel classes would be slow-steaming or super slow-steaming during the data collection phase?

- Similarly, how does one account for the fact that fuel is consumed onboard many vessels for purposes other than propulsion? Consumption of fuel for purposes other than propulsion includes a wide variety of functions that differ among classes and between vessels within a given class according to the trade they are operating in at any given time. These include, but are not limited to: refrigerated cargo, shaft-generators, ballast water system operations, exhaust cleaning systems, air-conditioning for passengers and crew, operation of cargo pumps, cargo heating, operation of inert gas generators, cleaning of cargo tanks, electrical power for the ship, transfer of cargoes, and a variety of other functions. Moreover, the magnitude of power used for these purposes will vary significantly from ship to ship as not all ships utilize the same systems or provide the same services.

- What would be the regulatory consequences of failing to comply with applicable vessel operational efficiency standards? If “flexibility mechanisms” are proposed in this context, do they in effect propose a global “market-based mechanism” where fees are assessed on those vessels that burn more fuel in a given year than is prescribed by the standard?

- What kind of enforcement regime would be necessary by the IMO and responsible Administrations to ensure that mandatory vessel operational efficiency standards are uniformly applied across the industry?

Conclusion

16 The co-sponsors believe that the Committee should consider and discuss the important policy questions that arise with the consideration of developing operational efficiency

standards in the maritime sector. Failure to fully discuss and address these questions could create a series of unintended and perverse outcomes in the global transportation system. Moreover, it is not clear that the development of legally-binding vessel operational efficiency standards would achieve superior results to the outcomes that will be achieved as a result of the significant regulatory standards and economic incentives that are already set in motion following actions recently taken under MARPOL Annex VI and as a result of broader market incentives.

Action requested of the Committee

17 The Committee is invited to consider the views expressed in this document and take action as appropriate.

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