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

Policy and Practical Issues that arise with Mandatory Operational Efficiency Standards

Submitted by

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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. Two proposals have been made to the Committee to date recommending that the IMO proceed with a process to develop legally-binding, fleet-wide operational efficiency standards. A third proposal, known as the Fuel Oil Reduction Strategy or FORS recommends the creation of a mandatory scheme to reduce the annual fuel oil consumption of existing ships. These proposals have, as their first proposed stage, the monitoring, recording and reporting of various data.

3. At MEPC 67 the Committee discussed whether it should pursue development of mandatory operational efficiency standards or explicit fuel consumption limits for ships. In this context, the Committee invited Member Governments and organizations to submit comments on the questions set out in paragraph 15 of MEPC 67/5 and in document MEPC 67/5/6. This document comments on MEPC 68/4/3 and provides information relating to the policy and commercial issues associated with the proposals before the Committee.
4 MEPC 68/4/3 states: “The concept of operational measures is not a new one in the shipping sector.” All ships undertake various operational measures to improve energy efficiency on a regular basis, because fuel comprises the majority of the fleet’s operating cost. That is not the issue. The issue is that the concept of governments establishing mandatory operational efficiency regulatory standards for the shipping sector -- and enforcing those standards, as a matter of law -- is indeed novel, is undefined, and would be challenging and complex. No transport sector has such standards. Before the Committee proceeds with such an endeavor, it is kindly invited to fully consider the implications.

**Operational Efficiency in the Transportation Sector**

5 Improvement of the efficiency of all transport modes is desirable for many reasons. The question for the Committee is whether the development of legally-binding operational efficiency standards (or as proposed by Germany, absolute fuel consumption limits per ship) are appropriate mechanisms to further this objective.

6 MEPC 68/4/3 asserts that different transport sectors require different approaches and that examining regulatory practices applied to other transportation sectors is “not helpful.” The sponsors respectfully submit that the experience of other sectors is relevant and helpful. One of the reasons that other transportation sectors are not subject to regulations governing the operational efficiency of their assets is that such regimes would be complex, difficult to enforce, and would create situations that may be inequitable to the owner or operator of a vehicle that consumes more fuel for reasons that are unavoidable.

7 Energy efficiency design standards are applied in other transport modes and have been applied to shipping via the adoption of the EEDI. But no government regulates the efficiency of an automobile, truck, locomotive, airplane, or appliance once it has been purchased. The lessons of other sectors are relevant, not because those sectors are the same as shipping, but because the complexity and problems that arise are of the same nature, if not greater, in international shipping. The significant problems that operational standards would invite should not be ignored or dismissed.

**Operational Efficiency is Heavily Influenced by Factors Outside the Owner’s Control**

8 MEPC 68/4/3 includes a list of factors that influence the operational efficiency of a ship. These factors all contribute to a ship’s operational efficiency; notably absent from the list are the environmental and commercial conditions that significantly impact fuel consumption. A ship’s fuel consumption can vary significantly for reasons that are largely beyond the control of a ship and its operator. Variations in operating and commercial conditions can affect fuel consumption and operational efficiency, including: sea conditions, currents, distances between ports or the berth availability that may require different speeds; service schedules; the amount of refrigerated cargo that requires supplementary power can vary from trade to trade and from ship to ship; in the case of tankers, demands made on fuel with respect to tank cleaning, cargo heating, operation of inert gas generators, etc. vary from ship to ship and voyage to voyage depending on the specific cargo being carried. Such variations make operational efficiency comparisons very difficult. Furthermore, it is not clear that a regulatory system is capable of recognizing or adjusting for these significant variables.

9 A ship may be deployed to a different trade lane where different environmental and/or commercial conditions apply, which will affect its energy needs for reasons unrelated to sound operating practice. The resulting change in the ship’s fuel consumption would have nothing to do with the inherent design efficiency of the ship or the efficiency of its operation. This issue is a problem that would arise with the concept of operational efficiency standards.
10 Paragraph 4 of MEPC 68/4/3 includes a list of operational measures used to enhance the energy efficiency of a ship. However, many ships already: operate under conditions of optimum trim, use and maintain effective antifouling coatings, utilize advanced software for weather routing, and generally apply best practices. Indeed, the adoption of measures to improve operational efficiency has grown notably in the last five years as reflected in the lower emission estimates in the IMO’s 3rd GHG Study. The proposals before the Committee do not provide any mechanism to distinguish between operational energy consumption improvements that could exist following a ship’s adoption of available best practices, and energy consumption that is unavoidable and dictated by the operating or commercial requirements of the particular trade a ship is operating in at any particular time. This raises questions of regulatory fairness, because significant variations in fuel consumption will exist for reasons other than changes associated with varying cargo loads and beyond those resulting from the application of best practices available to the ship.

Why Operational Standards Would Create De facto Average Speed Limits

11 MEPC 67/5/6 and MEPC 67/5 discussed how the creation of operational efficiency standards (developed from a baseline of the ship’s previous fuel consumption) would likely create de facto average speed limits for many ships. MEPC 68/4/3 attempts to dismiss this issue with a single statement: “Such an operational measure cannot be viewed as de facto speed limit as adjusting the speed is only one available measure a ship can apply to enhance its fuel efficiency.” This statement does not fairly recognize the complexity, interdependence, and relative weight of those factors (e.g., speed) that influence the fuel consumption of a ship.

To illustrate, consider an example:

A ship reports actual fuel consumed and work performed over a defined period. The ship’s fuel consumption is influenced by a variety of factors, but the ship’s hull form and other design features are established, and it is already using advanced software to optimize its route, maintains a clean hull and prop, and utilizes best practices. The different speeds the ship sails over the period monitored produce an average speed sailed that is 12.5 knots.

The ship subsequently moves to a different trade or routes where the average operating conditions are different. The ship has maintained all other variables constant (hull cleanliness, weather optimization, trim, etc.), but market conditions in the commercial route warrant a different range of speeds that result in the ship’s average speed to change to 13.5 knots in the next reporting period. Due to changed commercial and environmental conditions, the ship is sailing only one knot faster (on average), but the ship’s fuel consumption increases by roughly 24%. IMO operational efficiency standards may, however, require the ship to maintain or reduce its previous fuel consumption relative to some level of work performed. Given that the ship’s speed is one of the most significant variables in fuel consumption and that the speed/power relationship is exponential, the ship would face a de facto average speed limit and be unable to respond to the changing environmental and commercial conditions without some form of regulatory consequence or penalty.

Ship speed and hull form are critical variables in ship design and the EEDI, but for an existing ship, where the hull form and ship design is already established, it will be very difficult, if not impossible, to avoid the creation of a ceiling on the average speed of the ship.

12 The development of operational efficiency regulations that require the ship to maintain or decrease fuel consumption as measured over a previous period would effectively create de facto average speed limits for many ships. To suggest that ship speed is just one of many operational factors fails to adequately recognize the very significant impact that ship speed has on fuel consumption and operational effectiveness.
Understanding What Operational Efficiency Standards Are

13 Some parties may believe that proposals to develop operational efficiency standards are the equivalent of fuel economy standards for cars and trucks or energy efficiency standards for appliances. However, those standards are design standards, which the industry has fully supported. The IMO has already established the equivalent of vehicle fuel economy standards (or energy efficiency standards for appliances) in adopting the EEDI for new ships. Proposals to develop operational standards are fundamentally different in nature, because they would regulate how a ship is actually operated from an energy consumption perspective, and then impose some yet-to-be-defined financial consequence for burning more fuel than what the regime envisions the ship should consume.

14 Regulating and enforcing design efficiency standards can be done prior to the product being sold and entering operation. Regulating and enforcing the operational efficiency of the world’s fleet would require extensive, on-going data recording, monitoring and reporting of yet-to-be-agreed information by each ship in the global fleet. The compilation and analysis of such an extensive data base, if used to develop operational efficiency standards, would present a host of problems that include questions concerning the practical limits of what can be verified when the volume of data is very large, and questions of how “operating standards” can be formed from data that is shaped by a multitude of frequently changing environmental and commercial conditions, that may vary across and within specific ship groups organized by class and size. Further, because operational efficiency standards can be expected to involve potentially significant penalties for failing to meet the operational standard, the accuracy of data submitted by many thousands of ships and the ability of organizations to verify the extensive data sets generated by the regime, would present important and complex challenges for industry, administrations, and the IMO.

15 The regulation of operational efficiency is not done in any transport sector due to reasons noted earlier in this paper, and because operational standards introduce significant problems that stem from the difficulty and complexity to construct a regulatory regime that treats the regulated entity (i.e., the ship operator or owner) in a manner that is fair and equitable. No government would impose penalties on a truck driver because he operates his truck in a mountainous region that requires higher fuel consumption than the average for other trucks of the same type and size. No government penalizes a car owner whose driving pattern and fuel consumption varies from an average. The issues of fairness and equity also exist for international shipping. Governments have not established operational efficiency standards applicable to the transportation sector for a variety of reasons and these reasons are no less valid for international shipping.

Conclusion

16 A number of important and complicated policy questions arise with proposals to develop mandatory operational efficiency standards for ships. Those recommending that the IMO establish mandatory operational efficiency regulations for the world’s fleet have proposed a novel and challenging regulatory destination. The sponsors invite the Committee to undertake a full discussion of the issues highlighted in 67/5 and the comments noted in this paper.

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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