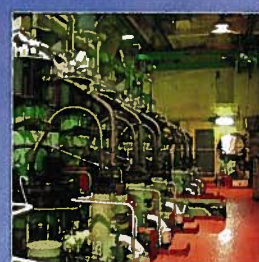
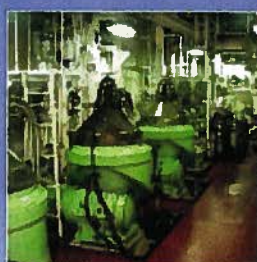
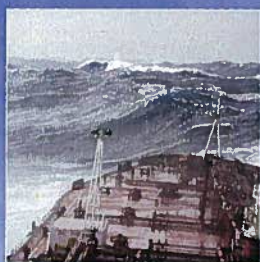


Energy Efficiency and Fuel Management



Energy Efficiency and Fuel Management

Introduction

This document is prepared as management guidance with the aim of encouraging companies to implement CO₂ reducing practices and technologies as part of a culture of fostering continuous improvement. The guidance, which utilises the standard framework of Tanker Management Self Assessment (TMSA), identifies methodologies available for consideration and elements of these may be included in TMSA at a future date.

The guide provides operators with a basis for assessing, modifying, and improving their management systems, with the aim of maximising Energy Efficiency. Best practices for achieving that aim are identified.

To be effective, the Energy Management Plan needs to comprise of more than just procedures. The Company Leadership/Management should define and communicate the company's values and aspirations and detail how the Company intends to achieve the objectives of their Energy Management Policy, including identification of roles and responsibilities, setting targets and monitoring performance.

In an effective system, hazards and risks are systematically identified and assessed to ensure that risk exposure is managed and considered by the appropriate level of management. Where the need for change is identified, quantifiable measures are used to assess its effectiveness and facilitate continuous improvement.

Main Objective

Develop a proactive approach to Energy Efficiency and Fuel Management that includes improvement of vessel and voyage efficiencies aimed at reducing the CO₂ emitted from vessels by the use of auditable, prioritised methodologies.

The efficient use of energy should be a fundamental requirement for operators offering their vessels for charter to OCIMF members. Energy Efficiency and Fuel Management discusses the systems and procedures necessary for operational efficiency.

Energy Efficiency and Fuel Management

Vessels operators should establish and maintain procedures to measure and limit the use of energy in their operations. These should include provisions for:

- Minimising energy waste
- promoting energy efficiency awareness
- implementing vessel and voyage energy strategies to minimise energy usage
- promoting co-operation with charterers and others to facilitate energy efficient operations.

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Energy Efficiency and Fuel Management

Aim The Company maximises Energy Efficiency to minimise CO₂ emissions onboard its vessels through an auditable Energy Management Policy, and takes appropriate action to ensure effective onboard implementation.

STAGE	KEY PERFORMANCE INDICATORS	BEST-PRACTICE GUIDANCE
1	The Company has an Energy Management Policy that addresses vessel operations.	The Energy Management Policy includes the requirement for an Energy Management Plan that is regularly reviewed by senior management.
	An Energy Management Plan demonstrates effective on board implementation of the company energy policy.	Personnel are made aware of the content of the Energy Management Plan by the use of appropriate training and communication.
	An Energy Management Plan addresses voyage management and includes appropriate measurement and reporting requirements.	Systems are in place for monitoring and recording of data. Such systems may comprise of a database for recording information that includes daily consumption, speed, vessel condition (laden or ballast), weather, sea state and wind direction. The Company should be able to demonstrate that, where practical, backhaul opportunities are maximised and idle time is minimised through good liaison with charterers.
	An Energy Management Plan addresses efficient use of energy and vessel optimisation and includes appropriate measurement and reporting requirements.	The Company should be able to demonstrate that time and fuel consumption are fully accounted for on a voyage-by-voyage basis.
	Procedures are in place for the measurement and monitoring of overall fuel consumption.	Fuel consumption of main engines, boilers and auxiliaries is accurately measured and recorded.
	All fuel is purchased against a defined specification.	Fuel meets minimum IMO criteria, as defined in MARPOL Annex VI, or local/regional regulatory requirements.
2	The Company uses management tools to establish baseline criteria to facilitate performance improvements.	Tools such as the IMO CO ₂ Operational Index are utilised.
	Vessel operating procedures include measures that promote energy efficiency.	Trim is optimised on ballast voyages and is based on records of observed performance to achieve maximum efficiency. Acceptance trial data for new builds may not identify the most efficient trim condition and in-service trials to assess optimum conditions may be required. The best trim for the ballast passage should be tested and compared with other ballast conditions. Speed is optimised, where practical, by maintaining the most fuel efficient speed to minimise total fuel consumed throughout the entire voyage. Significant benefits may be realised through the use of 'Weather Routing'.
	Regular periodic reviews are undertaken of the performance of individual vessels.	Regular performance reviews are undertaken, which address issues that include: <ul style="list-style-type: none"> The calculation of specific fuel consumption trends. Other parameters for trending could include RPM, power and slip monitoring of hull condition and propeller fouling the performance of main engines, boilers and auxiliaries.

STAGE	KEY PERFORMANCE INDICATORS	BEST PRACTICE GUIDANCE
	The Company can demonstrate that fuels onboard meet an internationally recognised standard.	In addition to regulatory requirements, fuel samples are taken from every bunkering and are retained for an appropriate time. Where fuel is not purchased against a recognised standard, the services of a third party fuel analysis laboratory are employed.
	Onboard fuel management procedures are in place.	Consideration is given to issues that include fuel compatibility in order to minimise sludge production and keep the plant in optimum operational condition.
3	Targets for voyage management and vessel optimisation are set and regularly reviewed by management.	Positive targets are set with the aim of demonstrating continuous improvement in efficient use of energy. Reviews are undertaken at least quarterly and include the identification and implementation of appropriate improvement measures.
	The Company utilises available technology to ensure efficiency is maintained at the highest level.	Emerging technologies in the area of coatings and energy management are actively considered.
	New build processes embrace energy efficiency elements from conception to delivery.	Plant, hull and propulsion are optimised at the design stage.
	The Company actively seeks opportunities to cooperate with charterers to facilitate enhancements in vessel Energy Efficiency.	The Company is able to demonstrate that it is actively liaising with Charterers to optimise vessel speed and voyage schedules.
4	The Company employs real-time performance monitoring and raw data normalisation processes.	Integrated software is used by vessels and shore offices to facilitate data exchange for baseline analysis, the identification and implementation of prompt corrective action and comparative analysis with similar vessels.
	The Company engages in external benchmarking exercises related to Energy Efficiency.	Analysis by a third party compares management systems with similar companies and identifies areas for process improvement.
	The Company has a willingness to explore new ideas and engages in Technology Partnerships.	As an example, the Company has considered the use of alternative fuels and innovative engineering concepts.



Glossary of Terms

Benchmarking

The process of comparing organisational performance and practices with others, preferably leaders in the same industry, for the purposes of identifying, understanding and adapting best practices from organisations anywhere in the world, to help an organisation improve its performance.

Company

As defined by SOLAS Chapter IX/1, the Company is the owner of the ship or any other organisation or person, such as the manager or the bareboat charterer, who has assumed responsibility for operation of the ship from the owner of the ship and who, on assuming such responsibility, has agreed to take over all the duties and responsibilities defined by the ISM code.

Energy Efficiency

Energy Efficiency is making the best use of the energy expended to obtain the maximum work done in order to achieve fuel savings.

Energy Management Plan

The Energy Management Plan provides practical details for the implementation of the Energy Management Policy and includes all elements necessary for the effective control of the Energy Management Policy principles.

Energy Management Policy

An Energy Management Policy is a statement of the high level aims of the company with regard to Energy Management.

IMO CO₂ Operational Index

The current version as defined in the IMO Circular.

Management Review

Management Reviews are held to evaluate the overall effectiveness of an organisation's performance and quality management system and to identify improvement opportunities. These reviews are carried out by the organisation's top managers and are conducted on a regular basis, such as quarterly. Topics typically on the set agenda include:

- Review of internal and external audits
- analyses of accidents, hazardous occurrences and nonconformities
- review of audit findings including status of close out
- recommendations following class and statutory surveys
- consideration for updating the system as a result of fleet changes, trade and market strategies, new regulations or changes in social and environmental attitudes.

Management System

A defined method to ensure that stated objectives are achieved. The system is documented and includes these key elements:

- Scope and objectives
- procedures
- resources responsible and accountable for implementation and execution
- a verification and measurement process to determine whether the desired results are being achieved
- a feedback mechanism to provide a basis for further improvement.

Management Tools

Systems and mechanisms for directing and controlling a group of one or more people or entities for the purpose of coordinating and harmonising that group towards accomplishing a goal.

Technology Partnership

A partnership with a supplier or manufacture to assist in the development of a new technology or equipment.

Weather Routeing

Weather Routeing is the use of meteorological data to assist in voyage planning to minimise fuel consumption, possibility of cargo damage, hull stress and to maximise crew safety. The information is supplied by a third party meteorologist either as an advised route or as raw data for display by software package for analysis onboard. Commonly a combination of the two methods is utilised.



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