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CIRCULAR

# 2024 Guidelines for the Development of SEEMPs

C25014 | 12 March 2025

Notice to: Ship Owners/ Managers/ Operators / Verifiers

This Circular is issued to advise that the IMO has adopted [Resolution MEPC.395\(82\)](#) – **2024 Guidelines for the development of a Ship Energy Efficiency Management Plan (SEEMP)** on 04 October 2024. The 2024 Guidelines are included in the Annex to [MEPC.395\(82\)](#). The 2022 Guidelines have been revoked.

The Guidelines cover:

- Part 1 – Ship Management Plan to Improve Energy Efficiency.
- Part 2 – Ship Fuel Oil Consumption Data-Collection Plan.
- Part 3 – Ship Operational Carbon Intensity Plan.

The Guidelines also include, as Appendix:

- Sample Form of Ship Management Plan to Improve Energy Efficiency.
- Sample Form of Ship Fuel Oil Consumption Data-Collection Plan.
- Sample Form of Ship Operational Carbon Intensity Plan.
- Standardized Data-Reporting Format for the Data-Collection System and Operational Carbon Intensity to the Administration.
- Standardized Data-Reporting Format for the Parameters to Calculate the Operational Carbon Intensity Indicators voluntarily.

## SEEMP Part 1

Guidance for Part I of the SEEMP is covered in sections 3, 4 and 5 of the Guidelines. This part provides an approach to monitor ship and fleet efficiency performance over time and describes ways to improve the ship's energy efficiency performance and carbon intensity. Part I of the SEEMP applies to any ship of 400 GT and above.

## SEEMP Part 2

Guidance for part II of the SEEMP is covered in sections 6, 7 and 8 of the Guidelines. This part describes the methodologies that should be used to collect the data required and the processes that the ship should use to report the

data to the ship's Administration or any duly authorized organization. Part II of the SEEMP applies to any ship of 5,000 GT and above.

### SEEMP Part 3

Guidance for part III of the SEEMP is covered in sections 9 - 15 of the Guidelines. The purpose of this part is to provide:

- attained annual operational CII calculation methodology;
- the reporting processes;
- the required annual operational CII for the next three years;
- an implementation plan documenting how the required annual operational CII should be achieved during the next three years;
- self-evaluation and improvement procedures; and
- Corrective Action Plan (for "D" or "E" rated ships).

Part III of the SEEMP applies to any ship of 5,000 GT and above which falls into one or more of the categories in regulations 2.2.5, 2.2.7, 2.2.9, 2.2.11, 2.2.14 to 2.2.16, 2.2.22, and 2.2.26 to 2.2.29 of MARPOL Annex VI.

### Part I - Ship Management Plan to Improve Energy Efficiency

Part I of the SEEMP should be developed as a ship-specific plan by the company and should reflect efforts to improve the energy efficiency and reduce the carbon intensity of a ship through four steps:

- planning,
- implementation,
- monitoring, and
- self-evaluation and improvement.

#### Planning:

##### **Ship-specific measures:**

Ship-specific measures to improve energy efficiency and reduce carbon intensity should be identified based on ship type, cargo, routes, and other factors (e.g., speed optimization, weather routing, hull maintenance, retrofits, alternative fuels).

- **Document existing measures:** The SEEMP Part I should detail past actions and their effectiveness.
- **Identify future measures:** Outline potential improvements, prioritizing initial, cost-effective actions to fund further upgrades.

##### **Company-specific measures:**

Energy efficiency and carbon intensity improvements require coordination among all stakeholders, including shipyards, owners, operators, charterers, suppliers, and ports.

##### **Human Resource Development:**

Personnel training and awareness are crucial for both planning and implementation of energy efficiency measures.

##### **Goal Setting:**

Goal setting should align with continuous CII improvement for ships under MARPOL Annex VI regulation 28. For other ships, establish clear energy efficiency and carbon intensity goals using indicators like fuel consumption, AER, cgDIST, EEOI, or other CIIs.

#### **Establishment of Implementation System:**

Essential steps for implementing energy efficiency and carbon intensity measures include:

- **Defining energy management procedures:** This involves outlining tasks and assigning responsibilities.
- **Establishing an implementation system:** This includes procedures for execution, clear authority levels, communication lines, and internal audits/management reviews.
- **Documenting implementation:** The SEEMP should detail each measure, responsible parties, and implementation timelines.

The development of such an implementation system may be completed at the planning stage.

#### **Implementation and record-keeping:**

- **Document implementation:** Record details of each measure's execution.
- **Explain deviations:** Note reasons for any unimplemented measures.
- **Record external factors:** Document events beyond crew control that affect performance (e.g., delays, weather)

#### **Monitoring:**

Energy efficiency monitoring should be quantitative and standardized.

- **Use goal indicators:** Employ established metrics (e.g., AER, CII) to track progress.
- **Select appropriate tools:** If no specific goal exists, use recognized indicators.
- **CII for regulated ships:** Ships under regulation 28 should primarily use CII, calculated per IMO guidelines.
- **Supplementary tools:** Additional tools are permissible, with justification documented during planning.
- **Ensure data integrity:** Regularly verify data consistency and monitor fuel consumption through daily or more frequent reporting.

#### **Establishment of monitoring system:**

Develop a monitoring system during planning, including data collection procedures and assigned roles.

Use shore-based staff and automatic data transfer from existing records (e.g., logbooks) to minimize onboard workload.

#### **Search and rescue:**

For search and rescue diversions (emissions excluded under regulation 3), exclude data from energy efficiency monitoring and record it separately.

#### **Self-evaluation and improvement:**

Establish periodic self-evaluation procedures using monitoring data.

#### **Fuel-efficient operations**

##### **Improved voyage planning:**

Optimize voyages through careful planning, using available software tools. Follow IMO voyage planning guidelines (resolution A.893(21)).

##### **Weather routeing:**

Weather routeing has a high potential for efficiency savings on specific routes.

##### **Just in time:**

Maximize berth availability and optimize speed through timely communication with the next port.

##### **Speed optimization:**

Speed optimization aims to minimize fuel consumption per tonne-mile, considering engine/propeller curves and potential issues like vibration and soot.

- **LNG carriers:** Optimize speed for tank pressure and operational LNG use.
- **Coordinate arrivals:** Factor in berth availability.
- **Gradual acceleration:** Reduce fuel consumption by slowly increasing speed after departure.
- **Charter party influence:** Encourage optimal speed in charter agreements.

##### **Optimized shaft power:**

Constant shaft RPM operation can improve efficiency compared to frequent engine power adjustments.

- **Consider overall system efficiency:** Ensure optimization doesn't hinder energy recovery or shaft generator operation, potentially increasing emissions.

##### **Optimum trim:**

Optimize trim for fuel savings, as each draft has a minimum resistance trim condition.

- **Continuous assessment:** Some ships can continuously monitor optimal trim.

- **Design/safety limits:** Trim optimization may be restricted by design or safety factors.

#### **Optimum ballast:**

Optimize ballast for trim, steering, and cargo planning.

- **Balance factors:** Consider trim and steering needs alongside cargo distribution.
- **Avoid over-reduction:** Less ballast doesn't always equal higher energy efficiency.

#### **Optimum propeller and propeller inflow considerations:**

Propeller retrofits improve fuel economy when system-wide; fins/nozzles enhance efficiency.

#### **Optimum use of rudder and heading control systems (autopilots):**

Optimize rudder and autopilot use to minimize "off-track" sailing and rudder resistance, saving fuel.

- **Integrated systems:** Improve course control with navigation and command systems.
- **Efficient autopilots:** Consider retrofitting for better performance.
- **Improved rudder design:** Explore retrofitting enhanced rudder blades.

#### **Hull maintenance:**

Optimize hull maintenance through integrated docking intervals and performance assessments.

- **Coatings & cleaning:** Utilize advanced coatings and regular cleaning to minimize hull resistance.
- **In-water inspections:** Regularly inspect hull condition.
- **Propeller maintenance:** Clean, polish, or coat propellers to boost efficiency.
- **Full paint replacement:** Consider complete paint removal/replacement to prevent roughness from repeated spot repairs.

#### **Propulsion system:**

Marine diesel engines offer high thermal efficiency, surpassed only by fuel cells. Electronic controlled engines can improve efficiency, but require specialized staff training.

#### **Propulsion system maintenance:**

Maintain propulsion system efficiency through manufacturer-recommended maintenance and condition monitoring.

- **Enhancements:** Consider fuel additives, lubrication adjustments, valve improvements, torque analysis, and automated monitoring.

#### **Improved cargo handling:**

Optimize energy use during cargo handling by efficiently using generators powering onboard equipment.

#### **Energy management:**

Optimize onboard energy management by reviewing electrical services and improving thermal insulation.

- **Reefer containers:** Optimize stowage to reduce heat transfer and consider water-cooled units for lower energy consumption.

#### **Fuel type:**

Consider alternative fuels for CO<sub>2</sub> reduction, but availability will often determine the applicability.

#### **Other measures:**

Explore various measures to improve efficiency:

- **Software tools:** Develop software for fuel consumption tracking, emissions footprinting, and performance optimization.
- **Renewable energy:** Consider onboard solar power.
- **Shore power:** Utilize shore power when carbon-efficient and available.
- **Wind propulsion:** Evaluate wind-assisted systems like rotors, sails, or kites.
- **Fuel quality:** Source higher-quality fuel to maximize power output.

**Age and operational service life of a ship:**

Measuring cost-effectiveness depends on oil prices and ship lifespan.

**Trade and sailing area:**

The trade a ship is engaged in may determine the feasibility of the efficiency measures under consideration. The length of voyage may also be an important parameter, as may trade-specific safety considerations.

**Part II - Ship Fuel Oil Consumption Data-Collection Plan**

MARPOL Annex VI Regulation 26.2 mandates a SEEMP Part II (Ship Fuel Oil Consumption Data-Collection Plan) for ships 5,000 GT and above. Part II describes data collection and reporting methodologies for annual fuel consumption, distance, hours underway, and other data required by Regulation 27.

**Guidance on Methodology for Collecting Data on Fuel Oil Consumption, Distance Travelled and Hours Under Way and Other Items****Total annual fuel oil consumption:**

Total annual fuel oil consumption includes all onboard fuel use (main/auxiliary engines, turbines, boilers, generators), regardless of operational status. Data collection methods (metric tonnes):

- Bunker Delivery Notes (BDNs)
- Flow meters
- Onboard fuel tank monitoring
- Onboard LNG cargo tank monitoring
- Onboard cargo tank monitoring (non-LNG fuel)

**Fuel oil consumption per consumer type:**

Fuel consumption per consumer (main engines, auxiliaries, boilers and others) collection methods can include :

- Flow meters
- Onboard fuel tank monitoring

If there is a consumer type whose fuel oil consumption cannot be determined directly according to one of these methods, the annual fuel oil consumption of that consumer type should be determined according to one of the following methods.

- subtraction: If only one consumer's consumption is unknown, subtract known consumption from the total.
- estimated fuel oil consumption: where none of the above methods can be applied, use an alternative method (manufacturer data, historical data) approved by the Administration.

**Conversion factor, CF:**

Where fuel oils, such as certain "hybrid fuel oils," are used that aren't listed in the 2022 EEDI calculation guidelines (MEPC.364(79)) and have no assigned CF-factor, the fuel oil supplier should provide a CF-factor supported by documentary evidence.

**Distance travelled:**

MARPOL Annex VI Appendix IX mandates reporting distance travelled:

- Logbook: Record distance over ground (nautical miles) per SOLAS V/28.1.6.
- Annual Aggregated Data: Include distance travelled under the ship's own propulsion.
- Alternative Methods: Administration-approved methods are acceptable, detailed in the Data-Collection Plan.
- Laden Distance: the distance travelled when carrying cargo.

**Hours underway:**

MARPOL Annex VI Appendix IX specifies that hours under way should be submitted to the Administration. Hours under way should be an aggregated duration while the ship is under way under its own propulsion.

**Data quality:**

The Data-Collection Plan should include data quality control within the safety management system. Additional measures could include:

- **Data gaps:** Procedures for identifying and correcting missing data.
- **Monitoring failures:** Procedures for handling data gaps due to equipment malfunctions (e.g., flow meters).

**Total amount of onshore power supplied:**

Calculate total onshore power supplied (kWh) from supplier documentation.

- Record source: Document the amount using supplier records.
- Storage: Store supplier documentation.
- Electronic records: Include billing information in electronic logs.

**Total transport work:**

Total transport work is the annual sum of each voyage's transport work, calculated as distance sailed multiplied by cargo carried.

**A standardized data-reporting format:**

Report collected data to the Administration using the standardized format in appendix 4 of the guidelines.

**Direct CO<sub>2</sub> Emissions Measurement (optional):**

- Exhaust gas analysis: Measure CO<sub>2</sub> concentration and flow in exhaust stacks. In the absence of and/or breakdown of direct CO<sub>2</sub> emissions measurement equipment, manual tank readings will be conducted instead.
- Position equipment to capture all ship CO<sub>2</sub> emissions, document in the monitoring plan.
- Equipment calibration: Specify and maintain calibration records onboard.

**Part III - Ship Operational Carbon Intensity Plan**

For certain categories of ships of 5,000 GT and above, the SEEMP shall include:

- A detailed methodology for calculating the attained annual operational CII and reporting it to the Administration;
- the required annual operational CII, as per regulation 28 of MARPOL Annex VI, for the next three years;
- an implementation plan outlining how the ship will achieve the required CII targets over the next three years;
- a procedure for self-evaluation and improvement.

Sections 9 to 15 of the Guidelines provide guidance (for ships under MARPOL Annex VI Regulation 26.3) for the following purposes:

- to assist them in developing part III of the ship's SEEMP, including guidance on developing a ship-specific method to collect necessary data;
- to describe the methodology that will be used to calculate the ship's attained annual operational CII value and report this to the ship's Administration;
- to determine the ship's required annual operational CII for the next three years;
- to develop and apply an implementation plan documenting how the required annual operational CII will be achieved during the next three years;
- to define a procedure for self-evaluation and improvement; and
- to develop corrective actions, as applicable.

Part III of the SEEMP is to include calculation methodologies and a plan of corrective actions for ships that are rated D for three consecutive years or rated as E.

Ships subject to regulation 28 of MARPOL Annex VI may consider voluntarily using one or more of the trial CII (EEPI, cbDIST, cDIST or EEOI), where applicable, to provide supporting data for decision-making to support the review clause set out in regulation 28.11 of MARPOL Annex VI. A standardized data-reporting format for the parameters to calculate the trial carbon intensity indicators on a voluntary basis is given in appendix 5 of the Guidelines. A description of the methodology that should be used to calculate the trial CII should be included in the SEEMP.

Part III of the ship's SEEMP should be updated in case of voluntary modifications or necessary corrective actions are involved (every three years).

## **ATTAINED ANNUAL OPERATIONAL CII CALCULATION METHODOLOGY, DATA-COLLECTION PLAN AND DATA QUALITY**

SEEMP Part III provides detailed information on how the ship's attained annual operational CII is calculated. It should include a detailed description of the data required for the calculation of the attained annual operational CII. The data collection should follow the relevant methodology and requirements on the Fuel Oil Data-Collection System according to regulation 27 of MARPOL Annex VI.

Transfer of the ship from one company to another:

- All relevant data necessary for the calculation of the attained annual operational CII should be submitted by the former company to the receiving company within one month after the date of transfer.
- The data should have been verified by the Administration or any organization duly authorized by it before they are transferred to the receiving company.
- The format of the transfer should be as per appendix 4 of the Guidelines and such that the receiving company can use it in the calculations of the attained annual operational CII for the whole year in which the transfer takes place.

In case of a transfer of both company and Administration concurrently, the incoming Administration may make a request to the Organization for access to the data according to regulation 27.11. If no such data is available, the attained annual operational CII can be calculated and verified using the available data covering a period of the preceding calendar year as long as practically possible.

- **Data Requirements:** Part III must specify required data for CII calculation, adhering to Regulation 27 methodologies.
- **Company Transfers:**
  - Transferring company must provide verified CII data to the receiving company within one month, in Appendix 4 format.
  - If the transferring company fails to provide data, the Administration may provide data from the IMO Fuel Oil Consumption Database.
  - In the case of Administration transfer, the new administration may request data from the IMO.
  - If no data is available, CII can be calculated/verified using available data from as much of the prior calendar year as possible.

### **Three-Year Implementation Plan :**

The three-year implementation plan outlines ship-specific measures to achieve required annual CII targets over the next three years:

- The plan should be SMART (Specific, Measurable, Achievable, Realistic, Time-bound).
- **Key Elements:**
  - List of energy efficiency and carbon intensity reduction measures, including implementation timelines and methods.
  - Explanation of how these measures will collectively achieve the required CII.
  - Identification of responsible personnel for implementation and monitoring.
  - Identification of potential impediments and contingency measures.
- **Monitoring and Adjustment:** The plan should be regularly monitored, adjusted as needed, and the monitored data should be identified.

### **Process For Self-Evaluation and Improvement:**

Procedures for self-evaluation of the ship's energy usage and carbon intensity should be developed and included in this section of the SEEMP. Self-evaluation should be carried out periodically based on data collected through monitoring.

The self-evaluation and improvement process could include:

- **Regular Audits:** Internal shipboard and company audits to verify implementation and effectiveness.
- **Improvement Actions:** Implementation of preventive or corrective measures based on audit reports.
- **Periodic SEEMP Review:** Regular reviews of the SEEMP and associated documents to ensure updates and minimize administrative burden.

Contents of self-evaluation and improvement could include:

- **Evaluation Criteria:** Monitoring quality, record-keeping, measure effectiveness (cause/effect), and goal achievement.
- **Measure Effectiveness Analysis:**
  - Evaluation of the effectiveness of the measures taken regarding energy efficiency and carbon intensity.
  - Identification of high-impact and ineffective measures.
  - Analysis of ship/company factors affecting CII and potential improvements.
- **Timeline:**
  - Schedule for review process before compliance period ends.
  - Timeline for implementing new measures.
- **Corrective Actions:**
  - Addressing deficiencies, data gaps, system weaknesses.
  - Implementing new measures (e.g., training, carbon intensity improvements).
- **CII Rating Improvement:**
  - Actions to improve CII ratings, including estimated carbon intensity reductions.
- **Corrective Action Plan (if required):**
  - Implementation of items to improve inferior performance.
- **Critical Factor Identification:**
  - Identification of factors that led to missing the CII target.

#### **Review and Update of Part III of the SEEMP:**

For ships rated as D for three consecutive years or rated as E, the SEEMP is to be reviewed to include a plan of corrective actions to achieve the required annual operational CII.

The SEEMP should include a log for when it has been reviewed and updated and identify which parts have been changed.

#### **Plan of Corrective Actions:**

A corrective action plan is only required if a ship receives a "D" rating for three consecutive years or an "E" rating for one year.

#### **Plan Submission:**

- **Revised SEEMP:** A revised SEEMP, including the corrective action plan for CII reduction, must be submitted for verification within one month of reporting the attained annual operational CII.

Ships with "D" (3 years) or "E" ratings must implement the planned corrective actions as per the revised SEEMP.

#### **Developing the plan of corrective actions:**

The plan is for ships rated "D" (3 years) or "E" (1 year) to achieve at least a "C" rating and ultimately meet the required annual operational CII.

#### **Key Features:**

- Ship-Specific.
- Use measures from Section 5 of the guidelines or other suitable options to improve fuel efficiency and CII.
- Plan Content:
  - Description of planned actions.
  - Implementation timeline.
  - Expected impact on CII rating.
  - Demonstration of how actions will contribute to achieving the required CII.
  - Incorporation of lessons learned from previous corrective actions.

#### **Corrective Action Plan (SMART - Specific, Measurable, Achievable, Realistic and Time-bound):**

- **Analysis:**
  - Cause of inferior CII rating.
  - Performance of existing measures.

- **Action Plan:**
  - List of new/revised measures, including implementation timelines and methods.
  - Designated responsible personnel for implementation, monitoring, and review.
  - Identification of potential impediments and contingency measures.
- **Implementation & Monitoring:**
  - Monitor and adjust the plan as needed.
  - Strengthen actions if intermediate results are insufficient.
- **Company Assurance:**
  - The company must confirm its ability to implement the plan when submitting the updated SEEMP.

### Act now

Ship Owners/ Managers/ Operators/ Verifiers are to take note of the contents of the Guidelines and be guided accordingly.