Ver. 1.1 (20 June 2022)

Remark

Please be noted that it is just a sample input and you need to revise the detail procedure in accordance with the company's procedure, and to arrange it as a company's document (i.e. provide cover page and/or document styles as necessary.)

SHIP FUEL OIL CONSUMPTION DATA COLLECTION PLAN

(PART II OF THE SEEMP)

1 Review and update log

Date/timeline	Updated parts	Developed by	Implemented by
yyyy/mm/dd	Newly developed	Technical Dept.	Technical Dept.
yyyy/mm/dd	Revised to update for IMO MEPC Res.395(82)	Technical Dept.	Technical Dept.

2 Ship Particulars

Name of the ship		
IMO number		
Company		
Flag		
Year of delivery		
Ship Type		defined by MARPOL Annex VI Reg.2
Gross Tonnage		same as IEE Certificate
NT		
DWT		
Attained EEDI (if applicable)		To enter in accordacnce with the item 3.1 of Supplement to IEE Certificate
Attained EEXI (if applicable)		
Ice class		

3 Record of revision of Fuel Oil Consumption Data Collection Plan

Date of revision	Revised Provision
yyyy/mm/dd	Newly developed
yyyy/mm/dd	Revised to update for IMO MEPC Res.395(82)

4 Ship engines and other fuel oil consumers and fuel oil types used

No.	Engines or other fuel oil consumers	Power	Fuel oil types
1	Main Engine (maker type)	9000 (kW)	HFO, LFO, MGO, Bio fuel
2	Aux. Engine No.1 (maker type)	800 (kW)	HFO, LFO, MGO, Bio fuel
3	Aux. Engine No.2 (maker type)	800 (kW)	HFO, LFO, MGO, Bio fuel
4	Aux. Engine No.3 (maker type)	800 (kW)	HFO, LFO, MGO, Bio fuel
5	Fired Boiler (maker type)	Evaporation of Fire side：1.0 ton/h	HFO, LFO, MGO, Bio fuel
6	Inret Gas Generator (maker type)	Capacity Nm3/h	MGO
7	Gas Conbustion Unit (maker type)	Capacity	LNG

5 Emission factors:

Fuel oil Type	C_F ($t\text{-}CO_2$ / t- Fuel)
Diesel/Gas Oil (Reference: ISO 8217 Grades DMX through DMB)	**3.206**
Light Fuel Oil (Reference: ISO 8217 Grades RMA through RMD)	**3.151**
Heavy Fuel Oil (Reference: ISO 8217 Grades RME through RMK)	**3.114**
Liquefied Petroleum Gas (Propane)	**3.000**
Liquefied Petroleum Gas (Butane)	**3.03**
Liquefied Natural Gas	**2.750**
Methanol	**1.375**
Ethanol	**1.913**
Bio fuel	***1**
Other fuel	***2**

CF is a non-dimensional conversion factor between fuel oil consumption and CO2 emission in the 2022 Guidelines on the method of calculation of the attained Energy Efficiency Design Index (EEDI) for new ships (resolution MEPC.364(79)), as amended. The annual total amount of CO2 is calculated by multiplying annual fuel oil consumption and CF for the type of fuel.

*1) Cf of bio fuel shall be determined in accordace with MEPC.1/Circ.905 INTERIM GUIDANCE ON THE USE OF BIOFUELS UNDER REGULATIONS 26, 27 AND 28 OF MARPOL ANNEX VI (DCS AND CII)

*2) A CF-factor for the respective product supported by documentary evidence should be provided.

6 Methods to measure fuel oil consumption

6.1 Measurement procedure, aggregation and calculation method of annual value in calender year

No.	Engines or other fuel oil consumers	Method	Description
	Total fuel consumption	Method 2: method using flow meters	Annual fuel oil consumption to be the sum of daily fuel oil consumption data of all relevant fuel oil consuming processes on board measured by flow meters. Amount for each type of fuel consumed from previous daily report for each navigation condition (at sea, at berth, at anchoring) to be recorded. The amount to be calculated based on fuel flow meter as per; The following formula to be used: (FOC measured by flow meter) [KL] × (density) [g/cm3] × (volume conversion factor) = FOC (MT) - The density [unit : g/cm3] to be confirmed by the fuel supplier (described in BDN). - FOC to be measured at 15℃. For the correction for temperature at 15℃, the volume conversion factor described in “attached conversion table II 2B, volume conversion factors per temperature” of “JIS K2249-4:2011 Crude petroleum and petroleum products - Determination of density - Part4:Ptroleum measurement tables” to be used.
1	Main Engine (maker type)	Method 2: method using flow meters	Annual fuel oil consumption to be the sum of daily fuel oil consumption data of all relevant fuel oil consuming processes on board measured by flow meters. Amount for each type of fuel consumed from previous daily report for each navigation condition (at sea, at berth, at anchoring) to be recorded. The amount to be calculated based on fuel flow meter as per; The following formula to be used: (FOC measured by flow meter) [KL] × (density) [g/cm3] × (volume conversion factor) = FOC (MT) - The density [unit : g/cm3] to be confirmed by the fuel supplier (described in BDN). - FOC to be measured at 15℃. For the correction for temperature at 15℃, the volume conversion factor described in “attached conversion table II 2B, volume conversion factors per temperature” of “JIS K2249-4:2011 Crude petroleum and petroleum products - Determination of density - Part4:Ptroleum measurement tables” to be used.
2	Aux. Engine No.1 (maker type)	Method 2: method using flow meters	Annual fuel oil consumption to be the sum of daily fuel oil consumption data of all relevant fuel oil consuming processes on board measured by flow meters. Amount for each type of fuel consumed from previous daily report for each navigation condition (at sea, at berth, at anchoring) to be recorded. The amount to be calculated based on fuel flow meter as per; The following formula to be used: (FOC measured by flow meter) [KL] × (density) [g/cm3] × (volume conversion factor) = FOC (MT) - The density [unit : g/cm3] to be confirmed by the fuel supplier (described in BDN). - FOC to be measured at 15℃. For the correction for temperature at 15℃, the volume conversion factor described in “attached conversion table II 2B, volume conversion factors per temperature” of “JIS K2249-4:2011 Crude petroleum and petroleum products - Determination of density - Part4:Ptroleum measurement tables” to be used.
3	Aux. Engine No.2 (maker type)	Method 2: method using flow meters	Annual fuel oil consumption to be the sum of daily fuel oil consumption data of all relevant fuel oil consuming processes on board measured by flow meters. Amount for each type of fuel consumed from previous daily report for each navigation condition (at sea, at berth, at anchoring) to be recorded. The amount to be calculated based on fuel flow meter as per; The following formula to be used: (FOC measured by flow meter) [KL] × (density) [g/cm3] × (volume conversion factor) = FOC (MT) - The density [unit : g/cm3] to be confirmed by the fuel supplier (described in BDN). - FOC to be measured at 15℃. For the correction for temperature at 15℃, the volume conversion factor described in “attached conversion table II 2B, volume conversion factors per temperature” of “JIS K2249-4:2011 Crude petroleum and petroleum products - Determination of density - Part4:Ptroleum measurement tables” to be used.
4	Aux. Engine No.3 (maker type)	Method 2: method using flow meters	Annual fuel oil consumption to be the sum of daily fuel oil consumption data of all relevant fuel oil consuming processes on board measured by flow meters. Amount for each type of fuel consumed from previous daily report for each navigation condition (at sea, at berth, at anchoring) to be recorded. The amount to be calculated based on fuel flow meter as per; The following formula to be used: (FOC measured by flow meter) [KL] × (density) [g/cm3] × (volume conversion factor) = FOC (MT) - The density [unit : g/cm3] to be confirmed by the fuel supplier (described in BDN). - FOC to be measured at 15℃. For the correction for temperature at 15℃, the volume conversion factor described in “attached conversion table II 2B, volume conversion factors per temperature” of “JIS K2249-4:2011 Crude petroleum and petroleum products - Determination of density - Part4:Ptroleum measurement tables” to be used.

Example: Flow meter and tank monitoring

Please modify in accordance with the company's procedure.

5	Fired Boiler (maker type)	Method 2: method using flow meters	Annual fuel oil consumption to be the sum of daily fuel oil consumption data of all relevant fuel oil consuming processes on board measured by flow meters. Amount for each type of fuel consumed from previous daily report for each navigation condition (at sea, at berth, at anchoring) to be recorded. The amount to be calculated based on fuel flow meter as per; The following formula to be used: (FOC measured by flow meter) [KL] × (density) [g/cm3] × (volume conversion factor) = FOC (MT) - The density [unit : g/cm3] to be confirmed by the fuel supplier (described in BDN). - FOC to be measured at 15°C. For the correction for temperature at 15°C, the volume conversion factor described in “attached conversion table II 2B, volume conversion factors per temperature” of “JIS K2249-4:2011 Crude petroleum and petroleum products - Determination of density - Part4:Ptroleum measurement tables” to be used.
6	Inret Gas Generator (maker type)	Method 5: method using tank monitoring on board for ships using cargo other than LNG as a fuel	To determine the annual fuel oil consumption, the amount of daily fuel oil consumption data measured by tank readings which are carried out by appropriate methods to the cargo used as a fuel. The method for tank readings should be specified in the SEEMP Data Collection Plan The tank readings will normally occur daily when the ship is at sea and each time the ship is loading or discharging cargo. The summary of monitoring data containing records of measured fuel oil consumption should be available on board.
7	Gas Conbustion Unit (maker type)	Method 2: method using flow meters	Annual fuel oil consumption to be the sum of daily fuel oil consumption data of all relevant fuel oil consuming processes on board measured by flow meters. Amount for each type of fuel consumed from previous daily report for each navigation condition (at sea, at berth, at anchoring) to be recorded. The amount to be calculated based on fuel flow meter as per; The following formula to be used: (FOC measured by flow meter) [KL] × (density) [g/cm3] × (volume conversion factor) = FOC (MT) - The density [unit : g/cm3] to be confirmed by the fuel supplier (described in BDN).

6.2 Flow meters identification/specification and their link to fuel oil consumers

Elements applied to fuel consumers	Flow meter's Specification
Main Engine	Maker: Type:
Aux. Engines (FO line inlet)	Maker: Type:
Aux. Engines (FO line outlet)	Maker: Type:
Aux. Engines (MGO line)	Maker: Type:
Fired Boiler	Maker: Type:
Inert gas Generator	Maker: Type:
Gas Conbustion Unit	Maker: Type:

Please input the identification / specification of the applicable flow meters.

6.3 Calibration of the flow meter

Chief engineer checks the soundness of measurement device regularly according to the following method.
- Compare the data of Fuel Oil Consumption and Remaining On Board for each voyage.
- In addition to the above procedure, measure the fuel oil tank level (tank sounding) and fuel temperature and calculate the actual volume and record it in the engine logbook or tank sounding report. Compare this actual volume with the remaining volume in the engine logbook or tank sounding report as calculated from the flow meter value and check if for any major discrepancy.

Please modify in accordance with the company's procedure.

7 Method to measure distance travelled including laden distance

Description
Data source is record in deck log book obtained from GPS or ECDIS or Paper chart. Annual value of distance travelled, over ground, to be integrated from daily records in Noon report, Departure Report and Arrival Report. Laden distance should be calculated as the distance sailed when the ship is loaded. Each noon/Departure/Arrival reports shall include cargo carried mass (MT) and/or No of TEU and/or No of Passengers then total laden distance and total transport work can be aggregated.

Please modify in accordance with the company's procedure.

8 Method to measure hours under way

Description
Data source is record in deck log book. Annual value of hours underway to be integrated from daily records in noon report.

Please modify in accordance with the company's procedure.

9 Method to measure total amount of onshore power supplied

Description
Total amount of onshore power supplied should be calculated as the sum of amount of onshore power supplied in kWh. The amount of onshore power supplied should be recorded based on relevant document by power supplier. The document should be stored. This information as shown on the bill from the port or electricity provider could be included in the electronic record.

Please modify in accordance with the company's procedure.

10 Method to measure transport work

Description
Each noon/Departure/Arrival reports shall include cargo carried mass (MT) and/or No of TEU and/or No of Passengers then total laden distance and total transport work can be aggregated. Definition of transport work per voyage is; containerships: cargo mass (MT) x distance (nm) and No of Containers x distance (nm) Cruise Passenger: No of Passengers x distance (nm) Ro-Ro Passenger: cargo mass (MT) x distance (nm) and No of Passengers x distance (nm) Any other: cargo mass (MT) x distance (nm)

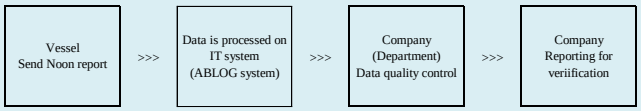
Please modify in accordance with the company's procedure.

11 Data quality

Description	
Data quality control measures: Internal reviews and validation of relevant data	Companies should assess the quality of the information in the aggregated report before submitting the report for verification. .1. Responsibility of Internal reviews and validation Company shall assign a person who has enough knowledge and experience on the ship data management as responsible person for internal review and validation (hereafter Internal Reviewer). .2. Contents of internal review and validation Internal Reviewer shall review whether the reported data is complying with Regulation and show a brief description identifying that the review and validation process includes a check on whether; - data is complete - comparison with data over previous years - comparison of fuel consumption reported with purchase records - comparison of factors obtained for fuel suppliers with international reference factors - and, criteria for rejecting data, if applicable
Additional measures to be considered: Data gap	(1) Data gap on FOC In case where the fuel consumption cannot be confirmed due to missing of the engine logbook, flow meter malfunction etc., Internal Reviewer shall take countermeasures for deciding the value of fuel consumption by means of checking BDN and measurement record of fuel consumption which has been done before and after bunkering and at the time of departure and arrival. (2) Data gap on distance travelled and/or hours underway In case where the distance travelled/hours underway cannot be confirmed due to missing of the deck logbook etc., Internal Reviewer shall take countermeasures for deciding distance travelled by ECDIS or Paper Chart and etc. In certain circumstances, Internal Reviewer may calculate based on port departure time and port arrival time.

Please modify in accordance with the company's procedure.

12 Processes that will be used to report the data to the Administration

Description
The vessel prepares electronic “Abstract Log” based respectively on the Deck log book and Engine log book every day at noon. Fuel consumption and other relevant data is recorded manually on board. The vessel is reporting the data in electronic form daily to the office in the standardized reporting format; the data is then stored, processed, and analyzed ashore. After the end of calender year, Company aggregates the data into annual value and reports the data to the Administration or RO for verification. In addition, the relevant underlying data will be exported to IT System established by Administration / RO for verification according to requirements. (Overview)   

Please modify in accordance with the company's procedure.