Shanghai Highwoods Ship Co., Ltd.

Guidance on Energy Consumption Collection from ship

1. Policy Requirements for Energy Consumption Collection

（1）How to understand the "last voyage" in the Measures. The voyage referred to in the Measures is different from the operational voyage, which refers to the voyage, berthing and operation between two adjacent berths. The specific operation can be carried out by piling the first berthing cable to the first berthing cable of the last voyage. For Non-berthing wharfs, barge crossing operations are carried out only in anchorage, buoy and other waters, whichever is the first anchor thrown or the first cable tied.

（2）Report on Energy Consumption Data of Ships in Foreign Ports. According to Chapter II of the Measures, international navigation ships do not need to report energy consumption data between foreign ports, nor do they need to report energy consumption data from domestic ports to foreign ports. According to Chapter 3 of the Measures, all energy consumption data (including between foreign ports) of Chinese international navigation vessels with a total tonnage of more than 5000 tons are submitted to and verified by authorized ship inspection agencies (now China Classification Society).

（3）Report on non-operational and no-load vessels. According to the Measures, energy consumption data need to be reported only during the operation period of a ship, and it is not necessary to report energy consumption data during the non-operation period, i.e. during the period of "not engaged in transportation work", but the scope of "non-operation period" should not be expanded. The navigation time, berthing time and other working hours of a ship in good technical condition during the period of being engaged in transportation work do not belong to the "non-operation period". The cases of carrying goods, repairing, etc. which are still engaged in transportation and production shall be included in the operating time.

The energy consumption data should be reported under normal no-load condition, and the turnover of cargo should be zero, but the data of distance, time and fuel consumption should be filled in normally.

Chapter I General Provisions

Article 1 These Measures are formulated in accordance with the Regulations of the People's Republic of China on the Prevention and Control of Marine Environmental Pollution by Ships and Their Related Operational Activities and the relevant international conventions to which China has acceded in order to do a good job in data collection and management of ship energy consumption, promote energy conservation and emission reduction of ships and protect the atmospheric environment.

Article 2 These Measures shall be applicable to ships with a total tonnage of 400 tons or more entering or leaving China's ports or with a main propulsion power plant of 750 kW or more. These Measures shall not apply to military vessels or fishing vessels.

Article 3 The Maritime Administration of the People's Republic of China (hereinafter referred to as the China Maritime Administration) is responsible for the data collection and information management of ship energy consumption nationwide. Maritime administrations at all levels are specifically responsible for data collection, report management and on-site supervision and inspection of ship energy consumption in their respective jurisdictions in accordance with their responsibilities. The Ship Inspection Institution (hereinafter referred to as the Ship Inspection Institution) authorized by the China Maritime Administration is specifically responsible for the verification and data verification of the Energy Efficiency Management Plan for International Navigation Ships of Chinese nationality (Part II).

Article 4 Ships shall fill in the Report Form of Ship Energy Consumption Data (Annex) in accordance with the requirements for data collection and reporting of ship energy consumption stipulated in these Measures.

Chapter II Data Collection and Reporting

Article 5 A maritime vessel shall report to the maritime administration the energy consumption data of the last voyage when it completes the departure report or the port of export formalities.

Article 6 A ship that meets one of the following circumstances may use a monthly report instead of a voyage report:

(1) Ships sailing in fixed waters with a single voyage lasting no more than 4 hours;

(2) Vessels sailing on fixed routes with a single voyage lasting no more than 24 hours.

Article 7 A ship intending to adopt monthly report shall record daily or per voyage energy consumption data in the ship log or special record book, and report the aggregated data of the previous natural month to one of the branches of maritime administration where the port is located 10 days before each month.
Where the branch maritime administrative agency receiving the monthly report considers that the ship meets the requirements of Article 6 of these Measures, it shall receive the report and notify the branch maritime administrative agency where the ship's other port of call is located.

Article 8 Inland river vessels shall record daily or per voyage energy consumption data in the ship log or special record book, and report the aggregated data of the previous calendar year to the maritime administration of the registered port before April 1 of each year.

Article 9 If a ship uses a special record book to record relevant data, the record book shall be kept on board for at least one year after completion of use for verification and inspection by the maritime administration.

Article 10 Ships shall report relevant data required by this chapter through the Maritime Information Platform.

Chapter III Additional Requirements for International Navigating Vessels

Article 11 This Chapter shall be applicable to international navigation ships of Chinese nationality (hereinafter referred to as international navigation ships) with a gross tonnage of 5000 tons or more.
Except in the case of conversion of flag, owner or operator, the reporting period referred to in this chapter is a calendar year, from January 1 to December 31 of each year.

Article 12 An international voyage ship shall submit the Energy Efficiency Management Plan for Ships to the Ship Inspection Authority, which shall examine whether the second part of the Energy Efficiency Management Plan for Ships meets the requirements of the Convention; if it passes the examination, the Ship Inspection Authority shall issue a conformity confirmation.

Article 13 International navigation ships shall collect and record data on energy consumption of ships, and report the data of the previous reporting period to the ship inspection authorities before April 1 of each year.

Article 14 Where an international voyage ship is converted from Chinese nationality to foreign nationality during the reporting period, the energy consumption data of the ship before the date of nationality conversion shall be reported within three months from the date of nationality conversion. Where an international voyage ship transfers from a foreign nationality to a Chinese nationality during the reporting period, the energy consumption data collected from the date of nationality conversion shall be reported by 1 April of the following year.

Article 15 If an international voyage ship converts its owner or operator during the reporting period, it shall report the energy consumption data of the ship before conversion within three months from the date of conversion, and report the energy consumption data of the converted ship before April 1 of the next year.

Article 16 A ship inspection institution shall verify the data of ship energy consumption. If the data conform to the actual situation, it shall issue a compliance statement to the ship.

Article 17 Ship inspection institutions shall submit to the China Maritime Administration data on energy consumption of ships in international navigation before May 1 of each year.

Chapter IV Supervision and Management

Article 18 Maritime administrative agencies shall supervise and inspect the collection and reporting of data on ship energy consumption within their jurisdiction.

Article 19 The China Maritime Administration shall regularly carry out assessment and inspection on the examination and verification of relevant documents, data verification and certification issuance of ship inspection institutions.

Article 20 Where a maritime administrative agency finds that a ship using monthly reports does not comply with the provisions of Article 6 in its supervision and inspection, it shall urge it to process the shipping reports in accordance with these Measures and notify other relevant maritime administrative agencies of the relevant information.

Chapter V Supplementary Provisions

Article 21 A voyage refers to the voyage, berthing and operation of a ship during two adjacent berths, starting from the last berthing time and ending from the current berthing time. Ship energy consumption data refers to ship basic information, transportation activity data and fuel consumption data related to ship energy consumption. Article 22 These Measures shall come into force as of January 1, 2019.

Appendix

Ship Energy Consumption Data Reporting Form

Reporting unit： Inspection institution：

Reporting cycle：

□Voyage Report

Last port of call□： yy/mm/dd/ time

This port of call： yy/mm/dd/ time

□Annual/Monthly Report

yy/mm/dd/～ yy/mm/dd/

Whether or not a ship has changed its flag/company during the reporting period

□Ship flag conversion □Switching Company □not applicable

No.	Items	Content/ Description	Remark
一、Ship particular			
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			When applicable
11			When applicable
12			EEDI/When applicable
13			When applicable

14	speed（knots）			When applicable
15	Rated power （kW）	main engine		
		auxiliary engine		
		Boiler		
2. Data on transport activities				
16	Turnover volume	Cargo (1000 tons per mile)		
17		Container (TEU per mile)		
18		Passenger Transport (P /Mile)		
19	Navigation distance (nautical miles)			
20	Navigation time (hours)			
21	Operating time (hours)			
3.Fuel Consumption Data of Ships				
22	Marine fuel consumption	Fuel 1	Fuel types	
			Quantity (tons)	
			Collection method	
		Fuel 2	Fuel types	
			Quantity (tons)	
			Collection method	
		… …	Fuel types	
			Quantity (tons)	
			Collection method	
23	Shore power consumption (kWh)			
24	Other energy consumption	Other Energy 1	Energy types	
			Consumption	
		… …	Energy types	
			Consumption	
25	Whether to use tail gas treatment device or not			

Head of Unit：　　statistical control officer：

Filling person：　　Contact number：

Relevant Requirements and Instructions for Filling in Forms

I. Overall description

1. The reporting cycle is optional. The voyage report should be filled in the first column and the annual/monthly report should be filled in the second column.

2. Mark items that are not applicable with N/A

3. For ships reporting on monthly or annual reports, if a voyage spans two reporting periods, the data of that voyage shall be included in the reporting period at the end of the voyage.。

II. Basic Information of Ships

4. The name of a ship includes the Chinese and English names of the ship. When there is an English name, the English name should be filled in at the same time.

5. The name of the company shall be the full name of the owner or operator of the ship responsible for data collection and reporting.

6. For international navigation ships, the ship identification information shall be submitted to the IMO number, i.e. the special identification code assigned by the ship according to the IMO Ship Identification Number Plan adopted by the IMO in accordance with resolution A.1078(28);

For other ships, the ship identification information shall be filled in with the ship identification number, that is, the only code for permanent identification of ships registered in China in accordance with the Regulations of the People's Republic of China on Ship Registration and the Regulations of the People's Republic of China on Ship Identification Number Management.

7. The flag State shall fill in the registry of the ship held during the reporting period.

8. The types of ships include international ships, domestic ships and inland ships. Where a ship sails within a fixed range of waters and the voyage time of a single voyage does not exceed 4 hours, and the voyage time of a single voyage does not exceed 24 hours on a fixed route, it shall be indicated in an appropriate form.

9. The types of ships include bulk cargo ships, gas carriers, liquid cargo ships, container ships, general cargo ships, refrigeration ships, part-time ships, Ro-Ro cargo ships (vehicle carriers), Ro-Ro cargo ships, passenger ships, ro-ro passenger ships, etc.

10. Construction time refers to the time when a construction contract is signed. In the absence of a construction contract, it means the time when the keel has been placed or is in a similar construction stage. Six valid figures were filled in in the construction time, the first four were years, and the last two were months, such as February 2006 in 2006.

11. The total tonnage shall be determined on the basis of the ship's certificate.

12. Net tonnage shall be determined on the basis of the ship's certificate.

13. Load tonnage refers to the difference of tonnage between draft water loaded in summer and draft water empty in water with a relative density of 1025 kg/m3. Summer loading draft shall be in accordance with the maximum summer draft specified in the stability manual certified by the competent authority or its authorized organization. Load tonnage shall be determined according to the ship certificate in tons (t).

14. The volume of container space shall be filled in by the container ship and determined according to the ship's certificate.
15. The ship energy efficiency design index (EEDI) is determined according to the "achieved energy efficiency design index" in the annex to the International Energy Efficiency Certificate (IEE Certificate).
16. Ice levels are defined in accordance with the International Rules for Ships Operating in Polar Waters.
17. The design speed is the maximum sustained speed in kn when the full-load drainage is used.
18. The rated power of the main engine, auxiliary engine and boiler refers to the maximum continuous output power marked on the nameplate of the main engine, auxiliary engine and boiler of reciprocating internal combustion engine in kilowatt (kW). If the ship has more than one auxiliary engine or boiler, then fill in the total rated power of the corresponding equipment.

III. Input of active data
19. Navigation distance, sailing time, operating time, passenger and cargo turnover are mainly collected according to ship navigation log, engine log, oil record book and navigation report.

20. Passenger and cargo turnover refers to the product of the volume of passenger and cargo (or converted volume) carried by ships and the corresponding transport distance.
21. Passenger and freight traffic volume or converted traffic volume shall be counted according to the following methods:
(1) For bulk carriers, gas carriers, liquid carriers, grocery carriers, refrigeration vessels, concurrent vessels, Ro-Ro carriers (vehicle carriers) and ro-ro carriers, the total quality of the goods carried is in tons.
(2) For container ships, the standard number of containers to be transported (TEU)
(3) For ships with mixed containers and other cargo, the unit is tonnage, which is a combination of the quality of containers and other cargo.
(4) For passenger ships (including Ro-Ro passenger ships), when the actual number of passengers (people) is difficult to count, the rated number of passengers will be used instead.
(5) In the case that the actual quality of the containers cannot be obtained, a heavy-duty standard box (TEU) can be converted to 10 tons, and an empty TEU can be converted to 2T.
22. Navigation distance refers to the actual navigational distance of a ship with its own power relative to the ground in the state of navigation, which is in the form of nmile.
23. Navigation time refers to the time when a ship leaves the berth, anchorage or buoy of the wharf from the port of departure, and when

the last cable or anchor is removed, it reaches the port to berth, anchorage or buoy, to tie the first cable or drop the first anchor, which is the time for the ship to navigate under its own power, in units of hours.

24. Operating time refers to the time when a ship is in good technical condition and can engage in shipping work, including sailing time, berthing time and other working hours. The cases where the ship is still engaged in transportation and production, such as repairing with cargo, shall be counted into the operation time in units of hours.

IV. Fuel Consumption Data of Ships

25. Fill in classification marks for marine fuel types. The specific classification marks are shown in the table below：

Classification identification	Name of fuel	statement
1	HFO	Equivalent to ISO 8217 RME to RMK
1.1	Sulphur content is higher than 0.5% m/m	
1.2	Sulphur content is higher than 0.1% m/m， but less than 0.5% m/m	
1.3	Sulphur content is less than 0.1% m/m	
2	LFO	Equivalent to ISO 8217 RMA to RMD
2.1	Sulphur content is higher than 0.5% m/m	
2.2	Sulphur content is higher than 0.1% m/m，but less than 0.5% m/m	
2.3	Sulphur content is less than 0.1% m/m	
3	Diesel/gasoline （MDO/MGO）	Equivalent to ISO 8217 DMX to DMB
4	Liquefied petroleum gas （LPG）（propane）	
5	Liquefied petroleum gas （LPG）（butane）	
6	LNG	
7	methanol	
8	ethanol	
9	OTHERS	

26. The quantity of marine fuel consumption includes, but is not limited to, the fuel consumption weight of all energy-using equipment, such as main engine, auxiliary engine, gas turbine, boiler and inert gas generator, in tons (t).
27. There are three main ways to collect marine fuel consumption (see appendix for details):
(1) Fuel tank measurement method, code A;
(2) The sum method of BDNs, code B;
(3) Fuel consumption flowmeter method, code C.
Marine fuel collection methods only fill in the code. If more than two methods are used, they can be filled in at the same time, but the collection method as a temporary alternative does not need to be filled in. If it is really necessary to change the method of data collection, necessary records and explanations should be made.

28. Shore power consumption refers to the shore power consumption when berthing in the harbor. According to the actual power consumption of the electric energy measuring instruments on board the ship, the unit is kilowatt-hour (kw.h).

Collection method of marine fuel consumption
Method A. Fuel tank measurement method
Fuel consumption is obtained by measuring fuel gauge, sonar, automation system and so on. The total amount of marine fuel during the reporting period is determined and calculated according to formula (1). Q=Q1+Q2+Q3+…Qn
In style：
Q1、Q2、Q3--- For the first, second and third time in the reporting period, fuel consumption was measured by fuel tank in tons.
Qn--- For the nth time in the reporting period, fuel consumption was measured through fuel tank in tons.
n—Total number of fuel tank measurements during the reporting period
In principle, fuel tank measurements should be made every day and every time fuel is added or refunded, and fuel tank measurements should be corrected when ships arrive at port or other feasible circumstances. If corrections such as density and temperature are adopted, the supporting documents should be retained. Survey data summaries and fuel consumption records should be kept on board.
Note: This method is not applicable to ships using gas fuels.

Method B. Add-up method of refueling receipts and receipts (BDNs)

This method is based on the refueling receipt form (BDNs), which adds up the refueling quantity in the reporting period, and the

inventory fuel quantity in the previous reporting period, then subtracts the refueling quantity and the fuel consumption carried over to the next reporting period to determine the total fuel consumption, and calculates the total fuel consumption according to formula (2)。

$Q = Qb + Qd + Qc + Qe$

In style：

Qb——Fuel tank stock at the beginning of the reporting period, in tons（t）；

Qd——The amount of fuel recorded in BDNs is in tons.（t）；

Qc——The quantity of fuel barge recorded in the oil record book in tons（t）；

Qe——Fuel tank stock at the end of the reporting period, in tons（t）。

The refueling receipt (BDNs) must be kept on board for at least three years.

In order to determine the difference of tank internal combustion oil margin before and after the reporting period, the fuel tank measurement method should be used at the beginning and end of the reporting period, respectively. Any supplementary data used to ultimately differentiate fuel storage in the fuel tank shall be retained in written proof.

Fuel refurbishment shall be in accordance with the records in the oil record book.

If the ship collects data by voyage and the voyage spans different reporting periods, the collected data shall be included in the reporting period at the end of the voyage.

This method is not applicable if there is no refueling receipt (BDNs) on board; for example, when ship-borne cargo (such as liquefied natural gas) is used as fuel, this method cannot be used alone.

Method C. Fuel consumption flowmeter method

This method is based on the reading of ship fuel flowmeter. The total amount of marine fuel consumption in the reporting period can be obtained by continuously reading the total amount of marine fuel consumption of all ship energy-using equipment. The total amount of marine fuel consumption in the reporting period can be calculated according to the formula. $Q = Qd1 + Qd2 + Qd3 + \ldots\ldots + Qdn$

In style：

Qd1、*Qd2*、*Qd3*——Vessel fuel consumption measured by marine fuel flowmeters for the first, second and third times in the reporting period in tons（t）；

Qdn——Marine fuel consumption measured by ship fuel flowmeter for the nth time in the reporting period (t)。

If the ship is not equipped with flowmeter or the flowmeter is

malfunctioning, other alternative methods should be used for data collection. Any alternative methods used, as well as corrections and maintenance of flowmeters, shall be recorded and retained on board.

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