LLOYD'S REGISTER GUIDANCE DOCUMENT

Guidance on the application of correction factors and voyage adjustments for calculation of attained CII

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Enerva Solutions

Introduction

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The Carbon Intensity Indicator (CII) requirements for ships have been introduced by IMO as a short-term GHG reduction measure. IMO has also allowed for voyage adjustment and correction factors for certain ship types, operational profiles and/or voyages with a view to enhancing, as appropriate, the CII Guidelines (G1). The corrections factors and voyage adjustments which may be applied to the calculation of the attained annual operational carbon intensity indicator are described in the CII Guidelines (G5).

A correction factor means a factor in the numerator or denominator of the CII formula which adjusts the calculation of the attained CII. Voyage adjustment deducts relevant fuel consumption, as well as the associated distance travelled from the calculation of attained CII for a defined period subject to certain threshold conditions being met.

IMO has prescribed a specific formula for CII calculation to be used when the corrections factors and voyage adjustments are applied. Proper data and supporting evidence need to be collected for submission to the verifier if the corrections factors and voyage adjustments are applied.

The purpose of this guidance is to provide practical tips on how and what data is to be collected and evidence obtained for the application of the corrections factors and voyage adjustments.

The information provided in this guidance is not intended to replace the relevant guidelines and regulatory documents published by IMO. It is instead complementary and has been prepared as a handy guide to assist persons involved with IMO DCS data collection and CII calculations.

Table: Voyage adjustments and correction factors applicability as per ship type

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Ship Type	FC_{voyage}	AF_{tanker}	$FC_{electrical\_tanker}$	$FC_{electrical\_container}$	$FC_{electrical\_gas/LNG}$	FC_{boiler}	FC_{others}	$f_{i,VSE}$	f_c
	Voyage Adjustments; EEDI & EEXI Correction factors	STS Voyage / Dynamic Positioning Shuttle Tanker	Electrical Consumption / Fuel for Discharge pumps [kWh]	Electrical Consumption / Fuel on Reefer Containers [kWh]	Electrical Consumption / Fuel for Reliquifaction / Cargo Cooling [kWh]	Boiler Consumption for Cargo Heating / Discharge	Engine Driven Cargo pump Consumption	Self - unloading Bulk Carrier voluntary structural enhancement	Cubic capacity Correction factor for Chemical Tankers
Bulk Carrier	✓							✓	
Combination Carrier	✓								
General Cargo	✓			✓					
Refrigerated Cargo Carrier	✓								
Ro-ro Cargo	✓								
Ro-ro Cargo (Vehicle Carrier)	✓								
Ro-ro Passenger	✓								
Cruise Passenger	✓								
Container	✓			✓					
Tanker	✓	✓	✓			✓	✓		✓
Gas Carrier	✓				✓				
LNG Carrier	✓				✓				

Voyage Adjustments

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Proper data and supporting evidence need to be collected **as per the approved SEEMP II or III** for submission to the verifier if the corrections factors and voyage adjustments are applied to the calculation of attained CII.

FC_{voyage}

Vessel to report total distance & fuel consumed during the following situations:

1. Voyages through ice (applicable to Ice Class vessels only)
2. Voyages for the purpose of securing the safety of a ship e.g. vessel at anchorage needs to go out to sea to avoid an impending storm or deviate during a voyage to take shelter
3. Voyages for saving life at sea e.g. rescue operation voyages or deviation to disembark seriously sick crew
4. Voyages undertaken due to damage to the ship or its equipment e.g. direct voyage to repair yard after damage to the propeller, steering gear, shafting etc.

The ship's logbook should include data entries for the voyage period with the date, time and position of the ship at the commencement and end of a voyage. For voyages through ice – the date, time and position of the ship when the ship encountered ice conditions and left ice conditions should be recorded.

Fuel consumption may be recorded by flowmeter reading or fuel tank monitoring at the start and end of a voyage, as per whichever method is approved in SEEMP II or III. Photo evidence of logbook entry for flowmeter readings or tank sounding at the start and end of a voyage (Logbook entry) is to be maintained for evidence.

For distance travelled record, deck logbook entries, ECDIS track or similar can be used as evidence.

Correction factors

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AF_{tanker}

1. Total quantity of each type of fuel consumed during STS (Ship to Ship) voyages including cargo transfer at an offshore location, voyage, cargo discharge and waiting periods at anchor or drifting during which the ship reports being part of an STS operation and voyage & fuel consumed in port where the transferred cargo is discharged after the STS voyage.

Note:- STS Voyages which qualify for correction:

- *If a voyage between cargo loading and discharging is < 600 NM **and** < 72 hours, correction may be applied to the voyage and the discharging operation*
- *If a voyage between cargo discharging and loading is < 600 NM **and** < 72 hours, correction may be applied to the voyage and the discharging operation*

2. Total quantity of each type of fuel consumed for Shuttle tankers equipped with dynamic positioning.

*Fuel Consumption can be recorded by Flowmeter reading or fuel tank monitoring at start and end of an STS voyage, as per whichever method is approved in SEEMP II or III. Photo evidence of logbook entry for flowmeter readings **or** Tank sounding at the start and end of STS voyage (Logbook entry) to be maintained for evidence.*

Correction factors (cont.)

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$FC_{electrical\_tanker}$

Vessel to report total kWh consumption as per kWh meter reading in every discharge report for cargo discharge pumps.

Total kWh consumption during cargo discharge = kWh meter reading at the end of operation - kWh meter reading at the start of operation (Photo evidence or Logbook entries can be considered as evidence). Note that cargo discharging kWh consumption should not include consumption during voyage adjustment periods.

$FC_{electrical\_container}$

1st method – Vessel to report the total kWh consumption from Reefer kWh meter in every report during the time reefer cargo is carried.

Total kWh consumption for reefer container = kWh meter reading at the end of report period - kWh meter reading at the start of report period (Photo evidence or Logbook entries can be considered as evidence).

2nd method – Vessel to report the total number of Reefer Containers carried onboard in every report from BAPLIE file. *BAPLIE file will be considered as evidence.*

Note – The first method is more accurate, whilst the second method may give more conservative results. Ship reefer kWh consumption should not include consumption during voyage adjustment periods

$FC_{electrical\_gas/LNG}$

Vessel to report Total kWh consumption as per kWh meter readings in every report for cargo cooling / reliquefaction systems

Total kWh consumption during cargo cooling / reliquefication = kWh meter reading at the end of operation - kWh meter reading at the start of operation (Logbook entries can be considered as evidence).

Note - Alternatives such as derivation of fuel consumption or kWh from auto-logged data may be used subject to approval by the Administration. Note that cargo cooling kWh consumption should not include consumption during voyage adjustment periods.

Correction factors (cont.)

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FC_{boiler}

Vessel to report the total quantity of each type of fuel consumed for boiler during cargo heating and discharge.

Fuel Consumption can be recorded by flowmeter reading or boiler fuel tank sounding at start and end of heating / discharge operation. Photo evidence of log book entry for flowmeter readings **or** Tank sounding at start and end of cargo heating or discharge to be maintained for evidence.

Some amount of fuel consumed by the boiler during cargo heating or discharge operations may be attributed to other purposes, e.g. calorifiers. It is not necessary to split these out from reporting.*

**Note that boiler consumption should not include consumption during voyage adjustment periods.*

FC_{others}

Vessel to report the total quantity of each type of fuel consumed by standalone engine driven cargo pumps for operating the cargo pump during discharge operations.

*Fuel Consumption can be recorded by flowmeter reading or fuel tank sounding at start and end of discharge operation. Photo evidence of log book entry for flowmeter readings **or** Tank sounding at start and end of cargo discharge to be maintained for evidence.*

EEDI and EEXI correction factors

Correction factors for CII Calculation – As available in EEDI / EEXI technical file

f_i – For all Ice Classed ships.

f_m – For Ice Classed ships having IA Super and IA.

f_c – Cubic capacity correction factor for Chemical tankers.

$f_{i,VSE}$ – Voluntary structural enhancement correction factor for Self Unloading Bulk Carriers.

Conclusion

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It is imperative to accurately capture and record the data needed for applying the corrections factors and voyage adjustment throughout the CII reporting period. Proper evidence also needs to be maintained. It will be tedious to obtain the data and evidence if left for the end of the reporting period.

Lloyd's Register can offer assistance to provide a hassle-free solution to manage the CII and performance of your vessels.

Any questions?

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