TASNEEF
هيئة الإمـــــارات للتصـــنـيـف
EMIRATES CLASSIFICATION SOCIETY

Amendments to the “Guide for the Evaluation of Energy Efficiency Existing Ship Index (EEXI)”

Effective from 1/1/2026

The Guide has been updated in line with IACS Rec.172 (Rev.2 June 2025) “EEXI Implementation Guidelines”.

1 SCOPE

The scope of this Guide is to provide both TASNEEF technicians and shipowners with a common approach for the implementation of the upcoming energy efficiency MARPOL requirements, applicable to new and existing ships.

The approach in this Guide is applicable, unless instructed otherwise by the ship's Flag Administration.

The differences between the August 2022 version of the Guide and the one issued in October 2021 are:

- Various paragraphs throughout the whole document have been updated based on the IMO Resolutions adopted by Resolution MEPC 78 (June 2022) and aligned to IACS Rec. No.172 (June 2022) "EEXI Implementation Guidelines".
- Paragraph 2.1: a clarification on ship types for which Required and Attained EEXI is not applicable has been added.
- Paragraph 2.2: the list of references has been updated.
- Paragraph 4.8: references to in-service performance measurements as per MEPC.1/Circ.901 have been added.

The differences between this version of the Guide and the one issued in August 2022 are:

- Various paragraphs throughout the whole document have been updated based on the publication of IACS Rec. No.172 Rev.1 (April 2024) "EEXI Implementation Guidelines" and the adoption of Resolution MEPC.375(80) and Resolution MEPC.390(81) amending MEPC.335(76) "2021 Guidelines on the shaft/engine power limitation system to comply with the EEXI requirements and use of a power reserve".

2 GENERAL

2.1 MARPOL Annex VI amendments

The amendments to MARPOL Annex VI, adopted by Resolution MEPC.328(76) and entering into force on 1 November 2022, require the following new and existing ships of 400 GT and above having conventional propulsion (except when indicated otherwise):

- bulk carriers;
- gas carriers;
- tankers;
- container ships;
- general cargo ships;
- refrigerated cargo carriers;
- combination carriers;
- LNG carriers having conventional and non-conventional propulsion;
- ro-ro cargo ships (vehicle carrier);
- ro-ro cargo ships;
- ro-ro passenger ships;
- cruise passenger ships only having non-conventional propulsion

to calculate the Attained EEXI which shall result equal or less than the Required EEXI (see [3] and [4] for details).

In case of ships having non-conventional propulsion (diesel/electric, turbine or hybrid), the requirements to calculate an Attained EEXI and to comply with a Required EEXI are normally not applicable, but apply to cruise passenger ships having non-conventional propulsion and LNG carriers having conventional or non-conventional propulsion. Also, the requirements do not apply to category A ships as defined in the Polar Code as well as livestock carriers, barge carriers, heavy load carriers, yacht carriers and nuclear fuel carriers as provided for in MARPOL Annex VI Regulation 2.2.15.

For the definition of "heavy load carriers" please refer to IACS Rec. No. 170 (May 2022) "The term of "heavy load carrier" for the application of EEDI/EEXI and CII".

The verification of the ship's Attained EEXI, based on an EEXI Technical File, is to take place at the first annual, intermediate or renewal survey of the IAPP Certificate or the initial survey of the IEEC Certificate, whichever is the first, on or after **1 January 2023.**

A sample of the EEXI Technical File is provided in Appendix 1 of this Guide.

2.2 References

This Guide refers to the following IMO and IACS requirements and guidelines:

- IMO Resolution MEPC.254(67) - 2014 Guidelines on survey and certification of the energy efficiency design index (EEDI), as amended by Resolutions MEPC.261(68) and MEPC.309(73)

Note: where in column “Equivalent to Required EEDI Phase …” is indicated a number with “+” or “++” it means that it is more stringent than the corresponding EEDI phase but lower than the next Phase (e.g. “2+” means that it is more stringent than Phase 2 but less than Phase 3).

For those ships below the threshold identified by Table 2, the Required EEXI has not to be calculated and compared with the Attained EEXI. In this case, the Attained EEXI value only will be included in the EEXI technical file.

4 ATTAINED EEXI EVALUATION

Ships falling into the scope of EEDI requirement can use their certified Attained EEDI (as documented in the IEE Certificate) as an alternative to the Attained EEXI, providing it satisfies the Required EEXI. If verification is based on EEDI TF which has been approved by another Classification Society different from the one re-issuing the new IEE Certificate, the supporting documentation should include:

- the approved EEDI Technical File,
- a copy of the IEEC Supplement and/or approval letter
- a statement that the ship has not undergone major modification as defined in MARPOL Annex VI, Reg.2.2.17.

In all other cases, the EEXI is to be calculated as described in this chapter.

4.1 EEXI formula

$$\mathbf{EEXI} = \frac{\left(\prod_{j=1}^{n} j\right) * \left(\sum_{i=1}^{nME} P_{ME(i)} * FME(i) * SFC_{ME(i)}\right) + \left(P_{AE} * FAE * SFC_{AE}^{(1)}\right) + \left(\left(\prod_{j=1}^{n} j\right) * \sum_{i=1}^{nPTI} P_{PTI(i)} - \sum_{i=1}^{n} (i) * P_{AE}(i) * FAE * SFC_{AE}^{(1)}\right) - \left(\sum_{i=1}^{n} i(\,) * P_{i}(\,) * FME * SFC_{ME}\right)}{* i * * * * *}$$

(1) If part of the Normal Maximum Sea Load is provided by shaft generators, SFC_{ME} and CF_{ME} may – for that part of the power – be used instead of SFC_{AE} and C_{FAE}

In case (an) error(s) is/are found in the original EEDI Technical File which was approved at the time of delivery of the ship, then – for cases where a power limitation is implemented to satisfy the Required EEXI – the Attained EEXI will need to be calculated based on the correct data and an EEXI Technical File to be reviewed/approved.

For calculation of the Attained EEXI by the above formula, the parameters in Resolution MEPC.364(79), as amended apply, unless expressly provided otherwise.
The main parameters are explained in [4.2] to [4.10].

4.2 P_{ME} and Power Limitation

$P_{ME(i)}$ is normally 75% of the rated installed power (MCR) for each main engine (i).

The value of *MCR* specified on the EIAPP certificate (normally the rated power as indicated on the engine nameplate) is to be used for calculation.
If the main engines are not required to have an EIAPP certificate, the *MCR* on the nameplate is to be used; in case the nameplate is unavailable or illegible, the value as indicated on a valid Statutory certificate (e.g. International Tonnage certificate), or on a test report or certificate endorsed/issued by a Classification Society for the specific engine is to be used.

Whilst Resolution MEPC.335(76) as amended by MEPC.375(80) and MEPC.390(81) only defines overridable power limitations, IACS Rec. No. 172 also defines a number of power limitation cases that are considered non-overridable or “permanent during ship operation”, as follows:

A) Overridable Power Limitation

- EPL (All power limitation measures that are equivalent to power limitation as described in Resolution MEPC.335(76) as amended by MEPC.375(80) and MEPC.390(81) regarding limitation method, are to be regarded as overridable. This means in detail that all limitation of the fuel rack is considered in this way, independent from whether the crew can easily remove the blockage by breaking a seal or a tool is needed to remove the mechanical blockage)
- ShaPoLi
- Turbo Charger cut out by means of butterfly valve

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In case overridable Shaft or Engine Power Limitation is installed in accordance with Resolution MEPC.335(76) as amended by MEPC.375(80) and MEPC.390(81), $P_{ME(i)}$ is equal to 83% of the limited installed power (MCR_{lim}) or 75% of the original installed power (MCR), whichever is lower, for each main engine (i), except for the case of overridable power limitation and shaft generators as detailed in IACS Rec.172 para 6.1 and below.

B) Non-overridable Power Limitation or "permanent during ship operation"

- Propeller retrofit with shaft power limitation to prevent damage on the propeller or shaft (see Note 1 below)
- Turbocharger dismantling (see Note 1 below)
- Turbocharger cut-out by removable (bolted) blinding plate, or permanent (welded) blinding plate (see Notes 1 and 2 below)
- Permanent adjustment of fuel index (see Notes 1 and 2 below)
- Permanent Engine derating, i.e. cylinder cut-off, reduction of combustion volume (see Note 1 below).

Note 1: The 75% approach is applicable.

Note 2: All the following provisions to be satisfied:

a. Permanent physical sealing subject to annual survey.
b. Description of the power limitation to be included in the EEXI Technical File.
c. The limited power value is to be stated in the EEXI Technical File and if applicable, in the reissued EIAPP.

For both EEDI and pre-EEDI bulk carriers, tankers, and combination carriers of 20,000 DWT and above, undergoing Non-overridable Power Limitation, the Minimum Propulsion Power Assessment is to be verified according to MEPC.1/Circ.850/Rev.3.
~~Also, the existing manoeuvring booklet, if available, and the manoeuvring information displayed on the navigating bridge (pilot card and wheelhouse poster) should be updated.~~

In case of non-overridable Shaft or Engine Power Limitation, $P_{ME(i)}$ is calculated according to Option 2 in paragraph 2.2.5.2 of Resolution MEPC.364(79), meaning that $P_{ME(i)}$ is equal to 75% of the limited installed power (MCR_{lim}).

Ships that had a manoeuvering booklet, pilot card and wheelhouse poster before installing a power limitation should update the information in accordance with "Provision and display of manoeuvring information onboard ships "adopted by Resolution A.601(15) to state the limiting power and to provide the Master with the necessary information in the updated characteristics when the ship has all shaft and engine power available, and when shaft or engine power has been limited.

Depending on the power limitation method, different MCR values are to be considered in the EEXI formula according to Table 3.

Table 3

Parameter	**Source**		**Variable**	**Overridable** [1]	**Non-overridable other than propeller retrofit** [2]	**Non-overridable propeller retrofit** [3]
	Reference	**Paragraph**		**function of**	**function of**	**function of**
P_{ME}	MEPC.350(78) MEPC.364(79) MEPC. 364(79)	2.2.1 2.2.5.1 2.2.5.2	MCR_{lim}	*83% MCR_{lim}*	*75% MCR_{lim}*	*75% MCR_{lim}*
P_{AE}	MEPC. 364(79)	2.2.5.6	MCR	MCR	MCR_{lim}	MCR
$f_{j,ICE}$	MEPC. 364(79)	2.2.8.1	MCR	MCR	MCR_{lim}	MCR
$f_{j,RoRo}$	MEPC.350(78) MEPC. 364(79)	2.2.6 2.2.8.3	$V_{ref,F}$ V_{ref}	*75% MCR*	P_{ME}= *f(MCR_{lim})*	P_{ME}= *f(MCR_{lim})*

5 EEXI REVIEW AFTER ADOPTION OF PERFORMANCE ENHANCING MEASURES

In case of non-compliance with the requirement: **Attained EEXI ≤ Required EEXI,** consideration is to be given to carrying out modifications to the ships, such that:

- the numerator of the EEXI formula will decrease (normally action may be taken on P_{ME}, P_{AE} *or* P_{eff}) and/or
- the denominator of the EEXI formula will increase (normally action may be taken on *Capacity,* V_{ref}).

The actions to be evaluated are:

- the introduction of an Engine Power Limitation (EPL) or Shaft power limitation (ShaPoLi);
- for ships where the Electrical power table have been used to calculate P_{AE}, the introduction of energy efficient consumers and reconsideration of Electrical power table;
- the increase of V_{ref} by means of hydrodynamic improving devices (e.g. high efficiency propellers, propeller boss cap fins, Mewis duct, low friction paints, air lubrication); and
- the introduction of Innovative energy efficiency technology (e.g. waste heat recovery, wind assisted propulsion, photovoltaic cells).

The EEXI may be recalculated taking into account the effect of the modifications, but:

- an Engine Power Limitation or Shaft Power Limitation may require the advice or intervention of the Original Equipment Manufacturer (OEM), and is to be officially certified by means of a survey on board to also ascertain the actual power limitation arrangement;
- a revised power table is to be validated by either a survey on board (remote survey could be considered) or by reviewing the data recorded in data loggers, when fitted, and submitted for acceptance.

6 APPROVAL, SURVEY AND ONBOARD MANAGEMENT MANUAL

6.1 Approval of EEXI Technical File prior EPL/SHaPoLi on board

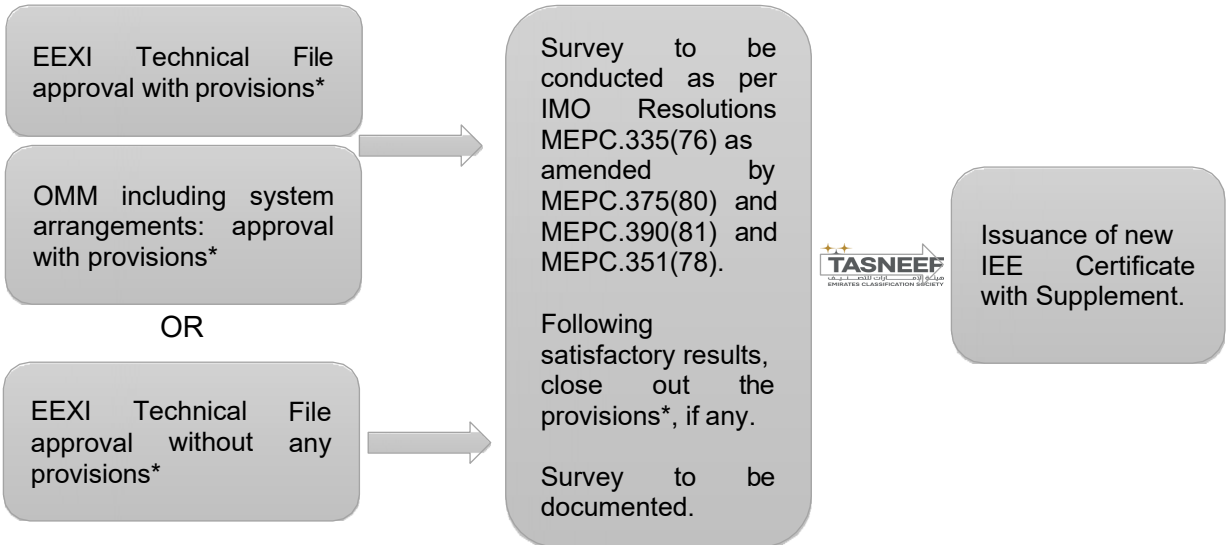
In case of EPL/SHaPoLi is intended to be implemented to satisfy the Required EEXI, the EEXI Technical File can be approved provided the following supporting documentation is included:

- *SFC* at new P_{ME} to be included. See [4.4] of this Guide.

For ships subject to the NO_x Technical Code: in case of change of engine critical settings or components, affecting NO_x Technical File, then NO_x Technical File to be amended and EIAPP reissued.

6.2 EEXI Technical File and OMM Approval Process

The following flowchart explains the route to the issuance of the new IEE Certificate with supplement:



* Provisions refer to the requirement that the power limitation will be installed as described in the EEXI Technical File.

EPL and OMM are subject to a survey onboard. The surveyor may issue the IEE Certificate only after having verified that the arrangements and procedures described in the OMM are in place.

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Unless advised otherwise by the Flag Administration, the approval of EEXI Technical File and Onboard Management Manual (OMM) will be carried out based on the applicable IMO resolutions, complemented by the guidelines in this Guide.

6.3 On-Board Management Manual (OMM)

Paragraph 2.1.1.3 of Resolution MEPC.335(76) as amended by MEPC.375(80) and MEPC.390(81) reads: "*a control unit for calculation and limitation of the power transmitted by the shaft to the propeller(s)* …omissis…". If this control is independent from the engine automation the following shall be satisfied:

- Override or exceeding of the limitation is indicated by giving an alarm on the bridge, clearly informing the ship's master or officer in charge of navigational watch OICNW:
  - In case of exceedance, the ship's master or OICNW to manually reduce the power within the limit;
  - In case of deliberate use of power reserve, data recording to commence automatically at the initiation of the alarm;
- Data recording device is to be installed and comply with paragraph 2.1.1.2 of Resolution MEPC.335(76) as amended by MEPC.375(80) and MEPC.390(81).
- In case of short-term unintentional exceedance of the power limit the system may inhibit the initiation of the exceedance alarm for up to a maximum of 5 minutes.

The OMM should clearly define this confirmation of the alarm as the deliberate action in agreement with requirement in paragraph 2.2.1 of Resolution MEPC.335(76) as amended by MEPC.375(80) and MEPC.390(81).

Paragraph 2.1.3 of Resolution MEPC.335(76) as amended by MEPC.375(80) and MEPC.390(81) reads: *"where technically possible and feasible, the SHaPoLi/EPL system should be controlled from the ships' bridge and not require attendance in the machinery space by ship's personnel".* It is clarified that there is no mandatory requirement to retrofit a new control system from bridge provided in any critical operating condition (such as adverse weather, piracy, traffic separated zone, maneuvering)", other than normal seagoing, the engine control room will be manned as per ship's safety management system procedures. If applicable, this needs to be covered in the OMM.

Paragraph 2.2.4 of Resolution MEPC.335(76) as amended by MEPC.375(80) and MEPC.390(81) reads: "*The SHaPoLi/EPL system (or each subsystem) should be tamper-proof*". It is clarified that the SHaPoLi/EPL system (or each sub system) is considered tamper-proof if it prevents the following actions:

- Overriding the limitation without authorization, from any operating or control position;
- If applicable, intentionally disabling the alerting-monitoring system;
- In case of SHaPoLi, intentionally disabling sensors, control unit, data recording and processing devices.

Paragraph 2.2.5.2 of Resolution MEPC.335(76) as amended by MEPC.375(80) and MEPC.390(81) reads: *"for EPL, a fuel index sealing system or power limitation system which can indicate and record the use of unlimited mode"*. It is clarified that the indication and recording can be addressed via fuel index alarm set up and recording as per ship's existing systems, if suitable, provided these are stated in the OMM.

Paragraph 3.5 of Resolution MEPC.335(76) as amended by MEPC.375(80) and MEPC.390(81) reads: *"The reactivation or replacement of the SHaPoLi/EPL system should be confirmed (e.g. validation of mechanical sealing) with supporting evidence (e.g. engine power log, photo taken at the occasion of resetting the mechanical sealing) by the Administration or the RO at the earliest opportunity"*. In respect of the above requirement, confirmation may be based on supporting evidence submitted by the owner, if accepted by the Administration or the RO acting on its behalf.

6.4 NOx

In case overridable or non-overridable power limitation is proposed in the context of EEXI calculation, its possible effect on NOx is to be considered according to Table 11.

Table 11

	Amendment to NOx TF	Change engine name plate	EIAPP certificate to be reissued	OMM	MPP (see note 2)
Overridable					
EPL or SHaPoLi	No (see note 1)	No	No	Yes	No
Turbocharger cut-out by butterfly valve	Yes	No	No	Yes	No