GUIDANCE NOTES
GD 22-2022

GUIDELINES FOR SURVEY OF REDUCING SHIP POWER

2022

Effective from 1 October 2022

Beijing

CONTENTS

CHAPTER 1 GENERAL

1.1 General provisions

1.1.1 The Guidelines are applicable to ships engaged on international voyages which require reducing ship power to meet EEXI requirements. If the ships engaged on domestic voyages apply voluntarily, it can be used for reference. In general, power limitation and power reduction modification can be used to achieve the target of reducing ship power.

1.1.2 The Guidelines specify technical requirements for ship power limitation or power reduction modification as well as requirements for survey and certification.

1.1.3 Ships subject to power limitation or power reduction modification are, in addition to satisfying the requirements of the Guidelines, to satisfy relevant provisions of ISC Rules for Classification of Sea-going Steel Ships, Rules for Materials and Welding and/or other applicable rules. Such ships are also to pay attention to relevant provisions of the flag State Administration (if any).

1.1.4 Ship power limitation and power reduction modification are not to adversely affect ship safety and normal operation.

1.1.5 Considering that technology of reducing ship power is still at development stage, if the systems other than those specified in the Guidelines are applied, corresponding test reports, theoretical basis, application experience or valid recognized standards are to be provided, and they may be accepted subject to the consent of ISC.

1.2 Definitions

1.2.1 For the purpose of the Guidelines, the following definitions apply:

(1) Shaft power means the mechanical power transmitted by the propeller shaft to the propeller hub. It is the product of the shaft torque and the shaft rotational speed. In case of multiple propeller shafts, the shaft power means the sum of the power transmitted to all propeller shafts.

(2) Engine power means the mechanical power transmitted from the engine to the propeller shaft. In case of multiple engines, the engine power means the sum of the power transmitted from the engines to the propeller shafts.

(3) Overridable Shaft Power Limitation (SHaPoLi) system means a verified and approved system for the limitation of the maximum shaft power by technical means that can only be overridden by

the ship master or the officer in charge of navigational watch (OICNW) for the purpose of securing the safety of a ship or saving life at sea.

(4) Overridable Engine Power Limitation (EPL) system means a verified and approved system for the limitation of the maximum engine power by technical means that can only be overridden by the ship master or the officer in charge of navigational watch (OICNW) for the purpose of securing the safety of a ship or saving life at sea.

(5) Power reserve means shaft/engine power above the limited power which cannot be used in normal operation unless in the case when SHaPoLi/EPL is unlimited for the purpose of securing the ship safety or saving life at sea, consistent with regulation 3.1 of MARPOL Annex VI (e.g. operating in adverse weather and ice-infested waters, participation in search and rescue operations, avoidance of pirates and engine maintenance).

(6) Power reduction modification means the modification that optimizes and adjusts the main propulsion units (including main engine, transmission device, propeller, etc.) in order to reduce maximum output power of engine.

1.3 Abbreviations and symbol description

1.3.1 For the purpose of the Guidelines, abbreviations and symbol description are as follows:

(1) SHaPoLi: Overridable Shaft Power Limitation;

(2) EPL: Overridable Engine Power Limitation;

(3) EEXI: Energy Efficiency Existing Ship Index;

(4) NOx: nitrogen oxide;

(5) EIAPP Certificate: Engine International Air Pollution Prevention Certificate;

(6) IAPP Certificate: International Air Pollution Prevention Certificate;

(7) OMM: Onboard Management Manual.

1.4 Plans and documents

1.4.1 For ships subject to power limitation, the plans and documents submitted for approval include but are not limited to:

(1) Power limitation system plan (including control, monitoring, alarm, etc.);

(2) Minimum power assessment (if applicable);

(3) SHaPoLi/EPL Onboard Management Manual (OMM);

(4) Test program (if applicable);

(5) Other documents which are deemed necessary by ISC.

1.4.2 For ships subject to power reduction modification, following plans and documents are to be submitted according to modification contents for approval (if applicable), which include but are not limited to:

(1) General arrangement;

(2) Arrangement of Shafting;

(3) Strength calculations for shafting;

(4) Shafting vibration and alignment calculation;

(5) Propeller plan and strength calculation for propeller;

(6) Propeller hydraulic installation and calculation;

(7) Cooling water system;

(8) Lubricating oil system;

(9) Exhaust system;

(10) Relevant electrical system (including control, monitoring, alarm, etc.);

(11) List of automation item;

(12) Minimum power assessment;

(13) Test program;

(14) Onboard Management Manual (OMM);

(15) Other documents which are deemed necessary by ISC.

1.4.3 Plans and documents submitted for information include but are not limited to:

(1) Power limitation/power reduction modification specification/scheme;

(2) List of modified components (if applicable);

(3) Arrangement of power limitation system (if applicable).

CHAPTER 2 SHIP POWER LIMITATION

2.1 General requirements

2.1.1 If the ship adopts power limitation method to reduce greenhouse gas emission from onboard engines, relevant technical and operational conditions for power limitation are to comply with the requirements of this Chapter.

2.1.2 Ship power limitation may be achieved by either engine power limitation or shaft power limitation, and power limitation includes two modes, i.e. overridable power limitation and non-overridable power limitation.

2.1.3 In addition to the provisions in this Chapter, electrical equipment in power limitation system is to meet applicable requirements of PART FOUR of ISC Rules for Classification of Sea-going Steel Ships.

2.1.4 In addition to the provisions in this Chapter, automation part involved in power limitation system is to meet applicable requirements of PART SEVEN of ISC Rules for Classification of Sea-going Steel Ships.

2.1.5 For propulsion shafting with restricted speed range, the RPM corresponding to New MCR Power after the power limitation is to be outside the restricted speed range with an operational margin of ±20% speed of the power limitation point.

2.1.6 In addition to the provisions in this Chapter, installation of components of engine/shaft power limitation system is to satisfy the requirements of installation position on engine/shaft, interface dimension, joints, shield, heat resistance and anti-vibration, etc. The components are to be easily installed and fixed on the engine/shaft, and all electronic circuit is to be secure and reliable to prevent loosing during operation.

2.1.7 When the ship adopts power limitation, if the changes of engine setting parameters and key engine components that affect the engine NOx emissions beyond applicable emission limit are not involved, the re-certification of the engine emissions may not be required. If such changes are involved, the requirements of paragraph 3.3, Chapter 3 of the Guidelines are to be met.

2.2 Overridable power limitation

2.2.1 System composition

Overridable power limitation system consists of overridable shaft power limitation system and

overridable engine power limitation system according to limitation approach.

2.2.1.1 Overridable shaft power limitation system is to consist of the following main arrangements:

(1) Sensors for measuring the torque and rotational speed delivered from the propeller shaft to the propeller(s) of the ship. The system is also to include the amplifier and the analogue to the digital converter;

(2) A data recording and processing device for tracking and calculation of the data as given in paragraph 2.2.2.7 of this Chapter; and

(3) A control unit for calculation and limitation of the power transmitted by the shaft to the propeller(s).

2.2.1.2 Overridable engine power limitation system is to consist of the following main arrangements:

(1) For the mechanically controlled engine, a sealing device which can physically lock the fuel index by using a mechanical stop screw sealed by wire or an equivalent device with governor limit setting so that the ship's screw cannot release the EPL without permission from the ship master or OICNW, as shown in Figure 2.2.1.2; or

(2) For the electronically controlled engine, fuel index limiter which can electronically lock the fuel index or direct limitation of the power in the engine's control system so that the ship's crew cannot release the EPL without permission from the ship master or OICNW.

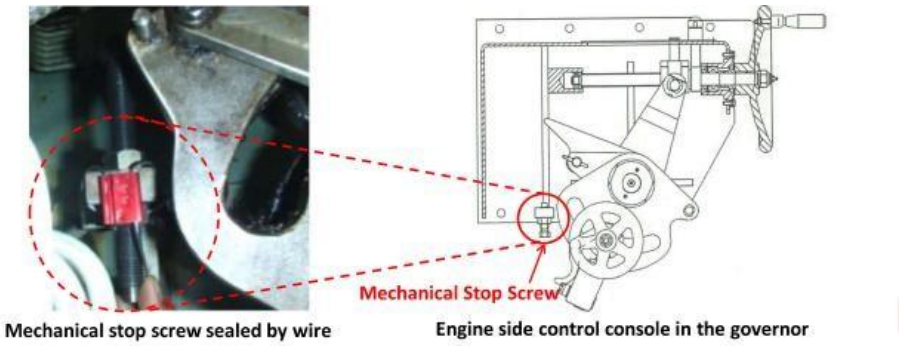

Figure 2.2.1.2 Sealing of mechanical stop screw

2.2.2 Technical requirements

2.2.2.1 When technically possible and feasible, SHaPoLi/EPL system is to be controlled from the ship's bridge and not require attendance in the machinery space by the ship's personnel.

2.2.2.2 The SHaPoLi/EPL system is to be non-permanent, but requires the deliberate action of

the ship's master or OICNW to enable the use of unlimited shaft/engine power (power reserve) of the ship.

2.2.2.3 For SHaPoLi/EPL system that uses a Password/PIN to control access to the power reserve override, attention is to be paid to ensure that the necessary Password/PIN is always available when override is required.

2.2.2.4 The SHaPoLi/EPL system or each subsystem is to be taper-proof.

2.2.2.5 For EPL for the mechanically controlled engine, the sealing device is to be either visibly indicate removal of the sealing when the ship's engine power exceeds the limited engine power as stated in the OMM for EPL or in any case of system malfunction, or be equipped with other systems such as an alert-monitoring system which can indicate when the ship's engine power exceeds the limited engine power as stated in the OMM for EPL or in any case of system malfunction and recording the use of unlimited mode, verified by ISC.

2.2.2.6 For SHaPoLi/EPL system for the electronically controlled engine, the control unit is to inform the ship master or OICNW clearly and conspicuously when the ship's shaft/engine power exceeds the limited shaft/engine power as stated in the OMM for SHaPoLi/EPL or in any case of system malfunction.

2.2.2.7 The SHaPoLi system for the electronically controlled engine is to indicate the following data during operation, and continuously record under unlimited power mode:

(1) Shaft rotational speed;

(2) Shaft torque;

(3) Shaft power;

(4) Total shaft power in case of multiple shaft arrangements.

2.2.2.8 For electronically controlled engine, EPL system is to be able to indicate and record the use of unlimited mode.

2.2.2.9 The procedure for SHaPoLi/EPL depends on the propulsion system and is to be described in the OMM for SHaPoLi/EPL in accordance with paragraph 2.2.4 of this Chapter.

2.2.3 Use of a power reserve

2.2.3.1 The use of a power reserve is only allowed for the purpose of securing the safety of a ship or saving life at sea, consistent with regulation 3.1 of MARPOL Annex VI (e.g. operating in adverse weather and ice-infested waters, participation in search and rescue operations, avoidance

of pirates and engine maintenance).

2.2.3.2 Use of a power reserve is not to have adverse effect on the propeller, shaft and related systems.

2.2.3.3 The ship master and OICNW are not restricted from exercising judgment to override the SHaPoLi/EPL when required for safety purpose. The authority for this is to be clearly set out in the OMM and/or Safety Management System Manual, as appropriate.

2.2.3.4 Any use of a power reserve is to be recorded in the record page of the OMM for SHaPoLi/EPL, signed by the master and kept on board. The record is to include:

(1) Ship type;

(2) IMO number;

(3) Ship size in DWT and/or GT, as applicable;

(4) Ship's limited shaft/engine power and ship's maximum unlimited shaft/engine power ;

(5) Position of the ship and timestamp when the power reserve was used;

(6) Reason for using the power reserve;

(7) Beaufort number and wave height or ice condition in case of using the power reserve under adverse weather condition;

(8) Supporting evidence (e.g. expected weather condition) in case of using the power reserve for avoidance action;

(9) Records from the SHaPoLi/EPL system and/or ship's original system for the electronically controlled engine during the power reserve was used; and

(10) Position of the ship and timestamp when the power limit was reactivated or replaced.

2.2.3.5 Where a SHaPoLi/EPL override is activated but the power reserve is not subsequently used, this event is to be recorded in the bridge and engine-room logbooks. The engine-room logbook is also to record power used during the period when the override was activated. The SHaPoLi/EPL is to be reset as soon as possible, and details of the reset is to be recorded in the bridge and engine-room logbooks.

2.2.3.6 In case of having used a power reserve, the ship is to without delay notify its Administration or ISC and the competent authority of the relevant port of destination with the information recorded in accordance with paragraph 2.2.3.4 of this Chapter.

2.2.3.7 Once the risks have been mitigated, the ship is to be operated below the certified level of

engine power under the SHaPoLi/EPL. The SHaPoLi/EPL system is to be reactivated or replaced by the crew immediately after the risks have been prevented and the ship can be safely operated with the limited shaft/engine power. The reactivation or replacement of the SHaPoLi/EPL system is to 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 ISC at the earliest opportunity.

2.2.3.8 Any defect of the SHaPoLi/EPL system is to be reported to the Administration or ISC in accordance with regulation 5.6 of MARPOL Annex VI.

2.2.3.9 During port State control, if overriding operation without proper notification and record in accordance with the requirements of this Section has been detected, the reactivation or replacement of the SHaPoLi/EPL system is to be immediately conducted in the presence of the Administration or ISC surveyor at the port.

2.2.4 SHaPoLi/EPL Onboard Management Manual (OMM)

2.2.4.1 SHaPoLi/EPL Onboard Management Manual can be approved in conjunction with ship EEXI verification, and it is to be permanently on board the ship for inspection.

2.2.4.2 SHaPoLi Onboard Management Manual is to, as a minimum, include:

(1) A technical description of the main system as well as relevant auxiliary systems;

(2) Identification of key components of the system by manufacturer, model/type, serial number and other details as necessary;

(3) Description of a verification procedure demonstrating that the system is in compliance with the technical description and information in accordance with (1) and (2) mentioned above;

(4) The maximum shaft power for which the unit is designed;

(5) Service, maintenance and calibration requirements of sensors according to sensor manufacturer, and a description how to monitor the appropriateness of the calibration intervals, if applicable;

(6) SHaPoLi record book for the recording of service, maintenance and calibration of the system;

(7) The description how the shaft power can be limited and unlimited and how this is displayed by the control unit as required by paragraph 2.2.2.7 of this Chapter;

(8) The description of how the controller limits the power delivered to the propeller shaft;

(9) The identification of responsibilities;

(10) Procedure for notification of the use of power reserve and the detection of malfunctions of the

system in accordance with paragraphs 2.2.3.6 to 2.2.3.8 of this Chapter;

(11) Time required for unlimiting the SHaPoLi;

(12) Procedures for survey of the SHaPoLi system;

(13) Record page of using the power reserved according to paragraph 2.2.3.4 of this Chapter.

2.2.4.3 EPL Onboard Management Manual is to, as a minimum, include:

(1) Rated installed power (MCR) or motor output (MPP) and engine speed (N_{MCR});

(2) Limited installed power (MCR_{lim}) or motor limited output (MPP_{lim}) and engine limited speed (N_{MCRlim});

(3) Technical description of the EPL system;

(4) Method for sealing the EPL (mechanically controlled engine);

(5) Method for locking and monitoring the EPL (electronically controlled engine);

(6) Procedures and methods for releasing the EPL;

(7) Time required for unlimiting the EPL;

(8) Procedures for survey of the EPL system;

(9) Procedure for the report on release of the EPL;

(10) EPL system administrator and administration position;

(11) Record page of using the power reserved according to paragraph 2.2.3.4 of this Chapter.

2.3 Non-overridable shaft/engine power limitation

2.3.1 If the equipment required by paragraph 2.2.1 of this Chapter is used for limiting the maximum shaft/engine power, personnel onboard ship are not to unlimit (e.g. permanent adjustment of engine fuel index) during ship operation, which can be regarded as non-overridable shaft/engine power limitation.

2.3.2 For the ship with non-overridable shaft/engine power limitation, it is to be determined that the ship still has sufficient propulsion power after power limitation to maintain maneuvering under adverse sea condition according to latest version of MEPC.1/Circ.850 on *Guidelines for determining minimum propulsion power to maintain the manoeuvrability of ships in adverse conditions* for power limitation operation.

CHAPTER 3 SHIP POWER REDUCTION MODIFICATION

3.1 General requirements

3.1.1 For ships subject to power reduction modification, relevant modification parts are to meet applicable requirements of this Chapter.

3.1.2 In addition to the requirements of this Chapter, equipment, system and material added or updated to the ship due to power reduction modification as well as relevant changes are to meet applicable standards.

3.1.3 In addition to the requirements of this Chapter, if overridable method is used, power reduction modification is to meet applicable requirements of Chapter 2 of the Guidelines.

3.2 Engine

3.2.1 The modified engines are to comply with the provisions of Chapter 9, PART THREE of ISC Rules for Classification of Sea-going Steel Ships.

3.2.2 Engine modification is generally carried out by engine licensor, manufacturer or the authorized organizations.

3.2.3 The engine modification design is to ensure that the engine can maintain continuous and stable operation under applicable operation mode and when the operation mode is changed.

3.2.4 The engine modification designer is to submit plans and documents with substantial modifications and/or new plans and documents for ISC approval or information.

3.2.5 On completion of engine modification, relevant system and equipment are to be verified by test with normal function and stable work, and main work parameters are controlled within the design range. Test is to consider fuels intended for use, operation mode and operation condition. Test requirements are as follows:

(1) Carrying out load test under applicable operation mode;

(2) Carrying out switch over test between operation modes under different load conditions (if applicable);

(3) Verifying minimum stable speed as specified by the designer and governor test under applicable operation mode;

(4) The response of all mechanical, hydraulic and electronic systems of modified engine is verified as predicted for all intended operation modes through integration test. The scope of these tests of

electronically controlled engine may be determined based on risk analysis results;

(5) On completion of test, necessary overhaul is to be carried out as required. The scope of overhaul is to be agreed by ISC surveyor.

3.3 NOx emission control

3.3.1 If ship power reduction modification does not involve change of engine setting parameters and key engine components that affect engine NOx emission, it is not required to carry out the re-certification of the engine emissions.

3.3.2 If ship power reduction modification involves change of engine setting parameters and key engine components that affect engine NOx emission, it is to check diesel engine components, settings or operating values according to the requirements of Engine Parameter Check method in paragraph 6.2, Chapter 6 of ISC Guidelines for Testing and Survey of Emission of Nitrogen Oxides from Marine Diesel Engines, to verify whether it is still within specified NOx emission limit:

(1) If it is within the scope of diesel engine components, settings or operating values affecting NOx emission and identified in engine technical files, it is not required to carry out the re-certification of the engine emissions, and the documents relating to onboard NOx verification procedure are to be maintained on board;

(2) If it is not within the scope of diesel engine components, settings or operating values affecting NOx emission identified in engine technical files, Simplified Measurement method (according to the requirements of paragraph 6.3, Chapter 6 of ISC Guidelines for Testing and Survey of Emission of Nitrogen Oxides from Marine Diesel Engines) is to be used for onboard confirmation test, or testing on engine test bed (according to the requirements of Chapter 5 of ISC Guidelines for Testing and Survey of Emission of Nitrogen Oxides from Marine Diesel Engines) is to be adopted to carry out the re-certification of the engine so as to verify that the engine subject to power reduction modification runs within specified NOx emission limit.

3.3.3 For the engine subject to pre-certification test, onboard Simplified Measurement method may be used to verify that the engine with power reduction modification complies with specified NOx emission limit, and this is only applicable to the verification of this engine rather than engine group or engine family.

3.3.4 If it is required to verify whether serial ship engine group or engine family with power

reduction modification still complies with specified NOx emission limit, parent engine is to be selected to carry out NOx emission test bed testing again. If NOx emission test can not be carried out on test bed again for some reason, an application is to be made to ISC requesting an on-board testing. The applicant is to demonstrate to ISC that the onboard test fully meets all requirements of a test bed procedure as specified in Chapter 5 of ISC Guidelines for Testing and Survey of Emission of Nitrogen Oxides from Marine Diesel Engines. Such onboard verification method is only acceptable to an individual engine or an engine group represented by the parent engine, and is not applicable to an engine family certification.

3.3.5 If above methods are not feasible, other equivalent NOx calculation, measurement or verification procedures may be accepted subject to approval of ISC.

3.4 Shafting and propeller

3.4.1 If shafting and propeller are changed due to ship power reduction modification, the requirements of Chapter 11, PART THREE of ISC Rules for Classification of Sea-going Steel Ships are to be met.

3.5 Shafting vibration and alignment

3.5.1 In ship power reduction modification, if there is restricted speed range, the RPM corresponding to New MCR Power after modification is to be outside the restricted speed range with an operational margin of ±20% speed of the maximum power point after modification.

3.5.2 If shafting is changed during ship power reduction modification, shafting vibration and alignment are to comply with the requirements of paragraph 12.1.1.4, Chapter 12, PART THREE of ISC Rules for Classification of Sea-going Steel Ships.

3.6 Electrical and control system

3.6.1 If power reduction modification is carried out by means of turbocharger re-optimization in combination with adjustable exhaust gas bypass, a device is to be provided to display bypass status.

3.6.2 If the change of automation monitoring alarm items relating to main propulsion unit is caused by power reduction modification, relevant requirements of PART SEVEN of ISC Rules for Classification of Sea-going Steel Ships are to be complied with.

3.7 Minimum propulsion power

3.7.1 For the ship subject to power reduction modification using non-overridable method, it is to

be determined that the ship still has sufficient propulsion power after modification to maintain maneuvering under adverse sea condition according to latest version of MEPC.1/Circ.850 on *Guidelines for determining minimum propulsion power to maintain the manoeuvrability of ships in adverse conditions* for power reduction modification.

CHAPTER 4 SURVEY AND CERTIFICATION

4.1 General requirements

4.1.1 This Chapter stipulates survey and certification requirements for ship power limitation or power reduction modification.

4.1.2 Prior to intended application for survey of ship power limitation or power reduction modification, implementation scheme as well as plans and documents are to be submitted to ISC according to the requirements of Chapters 1 to 3 of the Guidelines.

4.1.3 Products for ship power limitation and power reduction modification are to satisfy certification requirements in ISC Rules for Classification of Sea-going Steel Ships.

4.1.4 In addition to the provisions of the Guidelines, requirements relating to product and ship survey and certification are to be met.

4.1.5 For different power limitation/power reduction modification, requirements for NOx technical files, engine nameplate, EIAPP certificate, OMM and minimum propulsion power assessment (MPP) may be referred to Appendix 1.

4.2 Application for survey

4.2.1 Survey consists of survey of ship power limitation and survey of ship power reduction modification.

4.2.2 Application for survey of power limitation system or power reduction modification is generally to be carried out after approval of EEXI technical files in conjunction with ship periodical survey.

4.2.3 During survey, the applicant is required to make all necessary survey preparations and arrangements, and cooperate actively according to the provisions of the Guidelines so that the survey can be carried out smoothly.

4.2.4 The applicant is to truthfully introduce, explain the situation and provide relevant documents, and be responsible for the authenticity.

4.3 Survey of ship power limitation

4.3.1 General requirements

(1) Survey of ship power limitation is to verify that the power limits comply with approved plans/documents by checking power limitation system. When applicable, other survey contents

caused by power limitation system are also included;

(2) If power limitation system involves change of engine parameters and key components that affect engine NOx emission, NOx emission verification is to be carried out with reference to paragraph 3.3, Chapter 3 of the Guidelines.

4.3.2 Overridable shaft/engine power limitation

Power limitation and overridable operation is realized by setting overridable shaft/engine power limitation system, and overridable operation and record are to comply with the requirements of Chapter 2 of the Guidelines. Survey methods and contents mainly include following requirements.

4.3.2.1 Survey of overridable shaft/engine power limitation

(1) Documents to be confirmed include:

① Plans/documents of ship power limitation required by paragraph 1.4, Chapter 1 of the Guidelines;

② Certificate and quality certification document of power limitation system and main parts (if applicable);

③ Completeness and accuracy of test report and record.

(2) Real ship survey contents include:

① Checking completeness and accuracy of installation of power limitation system. When applicable, functions of power limitation system are also to be verified by test to confirm compliance with the requirements of paragraph 2.2.2, Chapter 2 of the Guidelines;

② Onboard Management Manual (OMM) is subject to real ship verification and approval by the survey unit according to approved plans and documents;

③ Confirming that information such as ship power limits have been identified in Ship Maneuvering Booklet (if applicable) and Wheelhouse Poster.

4.3.2.2 Annual/intermediate/special survey

Conformity of power limitation system is confirmed in conjunction with class annual/intermediate/special survey, with details as follows:

(1) Confirming that the power limitation system has not been changed since last survey, with normal function;

(2) Checking record of power limitation system, including:

① Power limitation system record, including monitoring alarm;

② Checking record page of Onboard Management Manual (OMM) according to the requirements of paragraph 2.2.3.4, Chapter 2 of the Guidelines;

③ Checking navigation logbook and engine logbook according to the requirements of paragraph 2.2.3.5, Chapter 2 of the Guidelines;

④ Submitting record information and supporting evidence to ISC in due time according to the requirements of paragraphs 2.2.3.6 to2.2.3.9, Chapter 2 of the Guidelines;

⑤ Personnel signature complies with the provisions of duty in Onboard Management Manual (OMM) and/or Safe Management Manual.

4.3.3 Non-overridable shaft/engine power limitation

4.3.3.1 Survey of non-overridable shaft/engine power limitation

(1) Documents to be confirmed include:

① Plans/documents of ship power limitation required by paragraph 1.4, Chapter 1 of the Guidelines;

② Certificate and quality certification document of power limitation system and main parts (if applicable);

③ Completeness and accuracy of test report and record.

(2) Real ship survey contents include:

① Checking completeness and accuracy of installation of power limitation system. When applicable, functions of power limitation system are also to be verified by test to confirm normal functions;

② After non-overridable shaft/engine power limitation, the stopping and turning performance as well as special operation performance required by ship design are to be confirmed by sea trial. The sea trial is to verify satisfactory operation of equipment or system at least under actual service condition. ISC may accept reduction of test items according to actual condition;

③ Confirming information of Ship Maneuvering Booklet, Wheelhouse Poster and Pilot Card have been updated.

4.3.3.2 Annual/intermediate/special survey

In conjunction with class annual/intermediate/special survey, to confirm that the power limitation system has not been changed since last survey, with normal function.

4.3.4 Certification

Survey results are as part of existing ship EEXI verification work, except for special application, a separate Statement of Compliance is generally not issued.

4.4 Survey of ship power reduction modification

4.4.1 General requirements

4.4.1.1 On completion of ship power reduction modification but prior to service, it is to be verified that the arrangement and technology comply with technical requirements of Chapter 3 of the Guidelines and approved plans/documents by modification survey.

4.4.1.2 In general, the contents of ship power reduction modification include engine, shafting, propeller as well as relevant electrical and control system.

4.4.1.3 After ship power reduction modification, sea trial is to be carried out according to modification range to confirm maneuvering performance (such as stopping and turning, etc.) and special performance required by ship design. The sea trial is to verify satisfactory operation of equipment or system at least under actual service condition. ISC may accept reduction of test items according to actual condition.

4.4.1.4 At site survey, test program is to be prepared according to modification contents and submitted to site surveyor for approval.

4.4.2 Engine modification

4.4.2.1 It is to confirm that engine modification has been subject to product plan approval according to the requirements of paragraph 3.2, Chapter 3 of the Guidelines.

4.4.2.2 If the modification involves change of engine setting parameters and key components that affect engine NOx emission, NOx emission verification and/or test is to be carried out according to the requirements of paragraph 3.3, Chapter 3 of the Guidelines.

4.4.2.3 In case of substitution of components, parts and materials or change in drawing and technical documents, the engine manufacturer (license holder) is to report the substitution or change to the patent owner for approval, and submit the confirmation issued by the patent owner and changed drawing and technical document to ISC for review and approval for the engines produced in technology licensing mode or the manufacturer may directly submit the related documents to ISC for review and approval for the engines produced in other mode.

4.4.3 Shafting and propeller modification

4.4.3.1 Shafting and propeller modification is to be subject to equipment installation test, mooring test, sea trial and necessary test (e.g. torsional vibration) according to modification range.

4.4.4 Other modification

If ship power reduction modification is carried out by other methods, the survey unit may determine survey contents according to modification scope, method and form.

4.4.5 Certification

4.4.5.1 For modification of existing equipment, only survey report is signed, and marine product certificate will not be reissued.

4.4.5.2 If the re-certification of the engine emissions has been carried out according to the requirements of paragraph 3.3, Chapter 3 of the Guidelines, EIAPP certificate is to be reissued (if applicable).

4.4.5.3 On completion of survey of ship power reduction modification, relevant ship certificate is to be reissued according to modification contents.

4.4.5.4 Survey results are as part of existing ship EEXI verification work, except for special application, a separate Statement of Compliance is generally not issued.

APPENDIX 1 EXAMPLE OF RELEVANT REQUIREMENTS FOR DIFFERENT POWER LIMITATION/POWER REDUCTION MODIFICATION

	Amendment to NOx technical file	Change engine nameplate	EIAPP certificate to be reissued	OMM	MPP[2]
Overridable					
EPL or SHaPoLi	No[1]	No	No	Yes	No
Turbocharger cut-out by butterfly valve	Yes	No	No	Yes	No
Non-overridable (permanent during ship operation)					
Propeller retrofit with restricted shaft power to prevent damage	No	No	No	No	Yes (Level 2 assessment is required)
Turbocharger dismantling Turbocharger cut-out by removable blinding plate, e.g. bolted, or permanent blinding plate, welded	Yes	Yes	Yes	No	Yes
Permanent adjustment of fuel index	No	No	No	No	Yes (Level 2 assessment is required)
Permanent engine derating, i.e. cylinder cut-off, reduction of combustion volume	New NOx technical file	Yes	Yes	No	Yes

Notes:

1 For EPL or SHaPoLi , in case of change of engine critical settings or components, affecting NOx technical file (NTF), the NTF to be amended. A statement from engine maker may be considered as acceptable supporting documentation and filed together with NTF.

2 Minimum Propulsion Power Assessment as per MEPC.1/Circ.850 is applicable only to bulk carriers, tankers and combination carriers of 20000 tonnes deadweight and above.

3 In general, other class requirements remain as applicable.