

## Instructions to Class

Category: Instruction no.: 1-2024

Operational       Nautical      Our ref. and file no.: 2023/15495

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### Approval of alternative design and arrangements for ships using alternative fuels

## 1 Purpose

1.1. Instructions to Class (IC) 1-2024 specifies functions and responsibilities of ROs acting on behalf of the NMA in the Alternative Design & Arrangements (AD&A) process for ships using gases or other low flashpoint fuels not specifically addressed in the IGF code. This includes, but is not limited to, the use of ammonia, hydrogen, and methanol as fuel.

## 2 Application

2.1. IC 1-2024 applies to ships registered in a Norwegian ship register.

## 3 References

- Agreement of 1 June 2002 between the Ministry of Trade, Industry and Fisheries and ROs concerning surveys of ships registered in a Norwegian ship register (the Agreement) article 2.2, 2.3 and 3.2.
- Regulations of 1 July 2014 No. 1072 on the construction of ships, section 3, which incorporates into the Norwegian legal order SOLAS Chapter II-1.
- Regulations of 27 December 2016 No. 1883 on ships using fuel with a flashpoint of less than 60°C
- International Code of Safety for Ships Using Gases or Other Low-flashpoint Fuels (IGF Code)
- MSC.1/Circular.1455 – Guidelines for the Approval of Alternatives and Equivalentents as Provided for in Various IMO Instruments
- MSC.1/Circular.1212/Rev.1 - Revised Guidelines on Alternative Design and Arrangements for SOLAS Chapters II-1 and III
- MSC/Circular.1002 – Guidelines on Alternative Design and Arrangements for Fire Safety

## 4 Repeal

None

## 5 Supersede

None

## 6 Background

There is an increasing number of ship projects involving new fuel types, for example the use of ammonia, hydrogen, and methanol as fuel. Each new fuel type represents unique safety challenges, but a regulatory framework is not yet developed. Hence, ship projects concerning new fuel types are approved and certified following the risk-based approach outlined in MSC.1/Circ.1455 on Guidelines for the Approval of Alternatives and Equivalents as provided for in various IMO Instruments.

For ship projects where the authority to perform statutory services are delegated to RO, the Agreement article 3.2 states that RO has the right to accept other technical solutions than those specified in the applicable instruments in question, provided the solutions are considered to provide an equivalent standard of safety. Where conditions of major importance to safety are involved, RO shall inform the NMA, and if possible consult the NMA in advance.

In order to achieve and maintain a unified safety approach in ship projects where ROs are performing the statutory services, the NMA finds it necessary to clarify what is expected from the ROs regarding when and in what extent etc. the NMA shall be involved during the approval of alternative design and arrangements related to new fuel types.

Details on requirements and the process for the approval of Alternative Design and Arrangements (AD&A) for ships using gases or other low flashpoint fuels, other than natural gas, for vessels where Recognized Organizations (ROs) are authorised to carry out survey, verification, and certification functions on behalf of the NMA are outlined in [Annex 1](#).

## 7 Item

7.1 ROs acting on behalf of the NMA in AD&A processes related to new fuel types, shall comply with the requirements and responsibilities outlined in Annex 1 which are aimed at the ROs.

7.2 ROs acting on behalf of the NMA in AD&A processes related to new fuel types, shall notify the ship owner, ship builder and ship designer of the requirements related to Design team outlined in section 6 of Annex 1.

# **Annex 1** - Approval of alternative design and arrangements for alternative fuels on vessels delegated to Recognized Organizations (ROs)

## **1. Purpose**

1.1. The Norwegian Maritime Authority (NMA) has provided this document with the purpose of specifying the requirements and the process for the approval of Alternative Design and Arrangements (AD&A) for ships using gases or other low flashpoint fuels, other than natural gas, for vessels where Recognized Organizations (ROs) are authorised to carry out survey, verification and certification functions on behalf of the NMA.

## **2. Application**

2.2 This document is limited to the process and the approval of Alternative Design and Arrangements (AD&A) for ships using gases or other low flashpoint fuels not specifically addressed in the IGF code. This includes, but is not limited to, the use of ammonia, hydrogen, and methanol as fuel.

2.3 Part A and part D of the IGF Code applies to ships using fuels as specified in 2.2. The goals and functional requirements of the Code shall serve as a basis for the approval of AD&A.

2.4 The approval of such fuels, appliances and arrangements can be given by NMA provided that the equivalence of the alternative design is demonstrated as specified in SOLAS, Reg. II-1/55.

2.5 If the AD&A specified in 2.2 necessitates an alternative design and arrangement for fire safety (SOLAS, Reg. II-2/17) or life-saving appliances (SOLAS Reg. III/38), the parallel AD&A processes (MSC/Circular.1002 or MSC.1/Circular.1212/Rev.1) can be included in the scope of this document if agreed upon with NMA in the specific project.

## **3. Introduction**

3.1. The NMA supports the use of AD&A to promote research and development of novel technology to facilitate for a reduction in GHG emissions from ships and innovation in ship design.

3.2 The NMA recognize the challenges and new hazards introduced with implementation of such novel technologies and therefore emphasizes the importance a rigorous and high-quality AD&A process to ensure the safety of the ship.

3.3. MSC.1/Circ.1455 Guidelines for the approval of alternatives and equivalents as provided for in various IMO instruments outlines the approval process and obligations of the Submitter and the Administration.

3.4 This document specifies the functions and responsibilities of the RO when it acts on behalf of the NMA in the AD&A process, as outlined in section 4.3 of MSC.1/Circ.1455.

#### **4. Application of IMO Guidelines and Class rules**

4.1. The guidelines contained in MSC.1/Circ.1455 shall be applied to all AD&As for ships using gases or other low flashpoint fuels, other than natural gas.

4.2 If IMO interim guidelines are developed for the fuel or system components in consideration, these guidelines can be used as basis for the AD&A process unless otherwise stated by NMA.

4.3 If the RO has developed Class rules for the fuels or system components in consideration these rules can be used as basis for the AD&A if agreed upon with NMA in the specific project.

4.4 The alternative design report shall in any case address all foreseeable hazards and document an equivalent safety level. Any simplification of the alternative design process is only accepted when presented by the design team and endorsed by NMA at an early stage for each specific project.

#### **5. Recognized Organization's AD&A team**

5.1 At the start of the AD&A process the RO shall submit a statement to NMA where RO's overall experience with comparable systems and technology, and similar AD&A processes are outlined.

5.2 For RO staff with leading roles in the review of the AD&A, the following shall be included in the statement.

- i. Summary of previous experience and its relevance to the design under consideration
- ii. Summary of academic and professional qualifications
- iii. Summary of contribution to the AD&A team

5.3 The statement will be assessed by NMA to verify that the RO has the necessary experience and competence available to act on behalf of the NMA in the specific AD&A process.

5.4 If the NMA considers that 5.3 is not met, the RO is not authorized to undertake the review of the AD&A studies on behalf of the NMA as set out in this IC. Special provisions are to be agreed between NMA and RO for the AD&A process.

## 6. Design team

6.1. At the start of the AD&A process the ship owner, ship builder and ship designer should establish a design team.

6.2. The design team is responsible for developing the design and the associated analysis for the AD&A.

6.3. Design Team members will normally represent the following stake holders:

- i. Designers (e.g. Ship builder/designer, equipment manufacturer)
- ii. Users (e.g. Ship owner, Ship's Staff)
- iii. Specialists (e.g. Subject Matter Experts (SMEs))
- iv. Maintainers (e.g. Ship owner, Ship's Staff, contractors if delegated maintenance roles)

6.4. A brief résumé for each design team member shall be documented and available at the kick off meeting, which provides the following:

- i. Summary of previous experience and its relevance to the design and technology under consideration.
- ii. Summary of academic and professional qualifications.
- iii. Summary of contribution to the design team's work.

6.5. The roles and obligations of the design team are outlined in section 3.2 of MSC.1/Circ.1455.

6.6 The ship owner, or any person acting on behalf of the company, has a duty to see to that the vessel is constructed, equipped and operated in accordance with the rules laid down in or pursuant to the Ship Safety and Security Act. The ship owner, or any person acting on behalf of the company, also has a duty to ensure that all documentation and information submitted to the NMA is in accordance with the design of the equipment/vessel, the vessel's operation and statutory requirements in general, cf. section 6 of the Ship Safety and Security Act. Therefore, they are considered to be the "principal stakeholders" responsible for the development and implementation of the AD&A.

6.7. The design team should appoint a co-ordinator who will act as the primary point of contact for the RO and NMA. The co-ordinator should be a representative of one of the principal stakeholders. Third party consultants should not be appointed as the design team co-ordinator.

## 7. The Role of Recognised Organisations

7.1. Recognised Organisations acting on behalf of the NMA are authorised to undertake the review of AD&A studies for compliance with applicable IMO Regulations and guidelines. However, the following activities are reserved to the NMA:

- i. Categorization of the new technology.
- ii. Acceptance of the identified rules, guidelines, codes and standards that are challenged by the design.
- iii. Acceptance of IMO interim guidelines and/or ROs rules for the fuels or system components in consideration applied as basis for the AD&D process.
- iv. Acceptance of, or exemption from, risk analysis.
- v. Agreement on evaluation criteria.
- vi. Approval of the Preliminary design.
- vii. Termination of the process because the evaluation criteria were not met.
- viii. Final approval.
- ix. Issuance of the Document of Approval.
- x. Submit the Report on Approval to the IMO via the IMO Global Integrated Ship Information System (GISIS) website.

7.2. Where appropriate, the NMA should be invited to attend design team meetings as observers. Normally, observers have no active part in the meetings. However, such attendance is particularly useful to gain confidence in the effectiveness of any risk assessment process undertaken (HAZIDs, etc).

7.3. Recognised Organisations shall ensure that:

- i. Policies and procedures for the review and approval of AD&A studies are in place.
- ii. RO staff involved in the review and approval of AD&A studies are suitably trained and experienced in the review and approval of AD&A studies and that this is reflected within the RO's internal staff authorisation framework.
- iii. RO staff involved in the review and approval of AD&A studies are trained and experienced in the application of risk assessment techniques.
- iv. RO staff involved in conducting on board surveys of ship systems approved in the AD&A process are trained and familiar with the general principles of AD&A approval.
- v. RO staff involved in conducting interim verification and initial ISM Audits are trained and familiar with the general principles of AD&A approval.
- vi. Procedures for the conduct of interim verification and initial ISM audits are in place to make sure that ship specific risk control measures and safety barriers constituting the basis for the AD&A approval are implemented in the Safety Management System (SMS).

7.4. Recognised Organisations shall also ensure the continued validity of the basis for approval and the effective implementation safety barriers identified in the AD&A studies during construction and in service, as part of relevant RO surveys.

## **8. Contact between the design team, Recognised Organisation and NMA**

8.1 Where it is intended to undertake an AD&A, the RO shall notify the NMA as soon as reasonably practicable. A preliminary design preview meeting (kick off) between representatives of the design team, the RO issuing statutory certification to the ship, and the NMA shall be arranged as early as possible in the design process.

8.2. The initial kick off meeting shall address the following:

- i. Communication throughout the project.
- ii. A review of the proposed concept or design.
- iii. A summary of relevant rules, guidelines, codes and standards that are challenged by the design.
- iv. Evaluation and application of relevant IMO Guidelines and Class rules, as outlined in section 4 of this IC.
- v. The risk assessment process to be applied.
- vi. List of documents to be considered.
- vii. Submission of documents to NMA.
- viii. Credentials of the design team to be documented.
- ix. The planned schedule for the AD&A process including expected document submission dates to the RO and NMA in line with the approval process outlined in MSC.1/Circ.1455.

8.3. Contact with and follow up of the design team shall primarily be handled by RO throughout the AD&A process.

8.4 Meetings between the design team, RO and NMA may be arranged on an ad hoc basis. Such meetings shall be coordinated by RO.

8.5 NMA shall be given access to relevant documents prior to meetings, to prepare and familiarize with the design. For HAZIDs and Kick off meetings shall documents be available to NMA minimum two weeks prior. The list of documents to be available shall be agreed with NMA for the specific project.

8.6 RO shall invite NMA to meetings between RO and NMA to discuss the chosen design solution, design changes, highlights of the findings and eventual barriers for progressing the process at each of the following milestones in the process:

- i. Approval of preliminary design
- ii. Development of final design

- iii. Final design testing and analyses
- iv. Approval

8.7 RO shall prior to the meetings present NMA with the findings of the assessment and clearly indicate their support or reservation for any aspect of the AD&A process, including recommendations or conditions as deemed appropriate. NMA shall after these meetings issue relevant statements or approvals, invite to further discussions with RO, or invoke section 7.1.vii. of this instruction.

8.8 RO is responsible for the minutes of meeting for the above listed meetings.

8.9 Initial contact with NMA can be arranged with an e-mail to [post@sdir.no](mailto:post@sdir.no) with the following subject: *Alternative design process – [Fuel] – [Project/vessel name] – [RO]*

## 9. Final Approval

9.1. Final approval of AD&A documents and the AD&A study shall only be undertaken by the NMA.

9.2. At each submission to the NMA, the RO shall review all submitted AD&A documentation prior to submission to the NMA for approval. The RO shall advise the design team of the findings from their review and require the design team to update the documentation as required before the documents are submitted to the NMA by the RO.

9.3. When the documents are submitted to the NMA the RO shall include the findings from their review of the documents.

9.4. Submissions to the NMA shall include all appendices and annexes to the documents.

9.5. The RO shall clearly indicate their support or reservation for any aspect of the AD&A in their submission and provide any recommendations or conditions as deemed appropriate.

9.6. On completion of the NMA's review of the AD&A documentation, the NMA will provide the RO with any comments that would need to be addressed by the design team to achieve final approval from the NMA.

9.7. When the AD&A has received final approval, the NMA will:

- i. Issue the Document of Approval;
- ii. Submit the Report on Approval to the IMO via the IMO Global Integrated Ship Information System (GISIS) website.

9.8. The original Document of Approval will be sent to the ISM Designated Person Ashore for the ship, unless the NMA is advised otherwise. The original Document of Approval is to be sent to the ship and retained with the ship's certificates.



9.9. A copy of the Document of Approval will be sent by the NMA to the RO or their records and will be provided to other members of the design team on request.

## **10. Reporting requirements**

10.1. The final AD&A report should include a summary providing the main outcome of the study and highlighting any areas where additional installations are required on board (e.g. dedicated sprinkler heads, fire detectors, etc.) or specific actions are to be followed (e.g. operational measures).

## **11. Use of third party consultants**

11.1. The use of third party consultants as part of the design team is a common approach taken in many AD&A projects, however, where third party consultants are utilised the principal stakeholders still remain fully responsible for the AD&A.

11.2. Where third-party consultants are employees of the separate consultancy business/division of the Company of the Recognised Organisation acting on behalf of the NMA issuing the statutory certification for the ship, the RO shall demonstrate that there is no conflict of interest and that the review of the AD&A will be or has been undertaken with complete impartiality and independancy. A suitable statement should be included in the AD&A study to this effect, for review and prior acceptance by the NMA.

## **12. Sister Ships**

12.1. AD&A studies are ship specific and individual AD&A studies shall be produced for each ship.

12.2. The NMA recognises that principal stakeholders consider it to be desirable for one AD&A study to be produced and applied to a series of sister ships. NMA can accept this approach subject to the following conditions:

- i. The sister ships are identical in design, arrangement, outfitting and construction;
- ii. The ships are built for the same ship owner in the same shipyard;
- iii. A review of applicable casualty data for the period since the keel laying of the first ship in the series is undertaken and it is confirmed that there have been no incidents that would impact on the validity of assumptions, decisions and analysis made in the original AD&A.
- iv. In service operational feedback (e.g. PSC deficiencies, operational failures, surveys, audits, etc.) from sister ships, to the extent practicable, is reviewed and it is confirmed that there have been no incidents that would affect the validity of assumptions, decisions and analysis made in the original AD&A.
- v. Any applicable amendments to IMO conventions or codes are considered and their impact on the original AD&A assessed.

12.3. Where conditions 12.2.i. are not met, a new AD&A study may not be necessary, provided that the design team can demonstrate that there have been no modifications to the design that is in conflict with the original approved AD&A;

12.4. Requests to apply an AD&A to a sister ship in accordance with 12.2 and 12.3 shall be made to the NMA via the RO. The Recognised Organisation shall clearly indicate their support or reservation for any aspect of the request to the NMA.

### **13. Ships Changing Flag to NIS**

13.1. When a ship that is subject to AD&A is to change flag to NIS without a change of Recognised Organisation, the RO shall submit the original AD&A reports and the Document of Approval to the NMA for review and final approval.

13.2. When a ship that is subject to AD&A is to change flag to NIS with a change of Recognised Organisation, the owner shall submit the original AD&A reports and the Document of Approval to the new RO for review. The new RO shall, after its review of the documents, submit the original AD&A reports and the Document of Approval to the NMA for review and final approval.

### **14. Operational Considerations**

14.1. It is the responsibility of the ship owner to ensure that the basis for approval of the AD&A is maintained and that any operational conditions or restrictions on which approval is granted are implemented.

14.2. Operational measures or restrictions required by the AD&A are to be taken into account by the ship owner within the company's safety management system.

14.3. The following documents shall be maintained on board:

- i. Document of Approval
- ii. Approved Documentation listed in the Document of Approval.

### **15. Alterations or modifications affecting the validity of the AD&A**

15.1. The ship owner is to notify the RO of any proposed alterations to the ship that affect AD&A. The ship owner shall provide an assessment that determines how the proposed alteration or modification affects the validity, assumptions or operational restrictions stipulated in the AD&A.

15.2 The RO shall review and comment on the assessment. On completion of their review, the RO shall submit details of the proposed alterations to the NMA along with any findings

from the review. The RO shall also provide recommendations to the NMA for any further analysis if deemed necessary to support the assessment.

15.3 The NMA will review the submission and advise its approval or any additional requirements. If deemed necessary, it may be required to undertake a new AD&A analysis.

## 16. References

- Agreement of 1 June 2002 between the Ministry of Trade, Industry and Fisheries and ROs concerning surveys of ships registered in a Norwegian ship register (the Agreement) article 2.2, 2.3 and 3.2.
- Regulations of 1 July 2014 No. 1072 on the construction of ships, section 3, which incorporates into the Norwegian legal order SOLAS Chapter II-1.
- Regulations of 27 December 2016 No. 1883 on ships using fuel with a flashpoint of less than 60°C
- International Code of Safety for Ships Using Gases or Other Low-flashpoint Fuels (IGF Code)
- MSC.1/Circular.1455 – Guidelines for the Approval of Alternatives and Equivalents as Provided for in Various IMO Instruments
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- MSC/Circular.1002 – Guidelines on Alternative Design and Arrangements for Fire Safety