

Approval process of alternative design and arrangements

This document outlines the approval process and expectations from the Danish Maritime Authority (DMA) regarding new ship design and arrangements. The process is based on IMO's MSC.1/Circ. 1455 - GUIDELINES FOR THE APPROVAL OF ALTERNATIVES AND EQUIVALENTS AS PROVIDED FOR IN VARIOUS IMO INSTRUMENTS. DMA refers to [DMA RO Circular no. 030](#), which provides a short description of the below steps of the approval process.

1. First contact

Enquiries regarding approvals of alternative ship design and arrangements should be directed to the Danish Maritime Authority's Regulatory Future Lab ([Future Lab](#)): futurelab@dma.dk. DMA's Future Lab will facilitate the further case management process and coordinate participation from DMA as well as assist with the progress of the project.

Future Lab facilitates a clarifying meeting, where the ship owner presents the project idea and DMA outlines the conditions and necessary steps of an approval process. DMA informs about cost associated with DMA's further case management and approval of the project¹.

2. Preliminary preview phase

Future Lab facilitates a workshop with participation of DMA, ship owner as well as RO and possibly an assigned consultant (assigned by ship owner). The objective of the workshop is to:

- Facilitate a detailed review of the shipping company's idea, including plans and specifications for the project.
- Assess whether existing regulations are challenged and hence whether there is an actual need for approval of the actual design and arrangements as alternatives and equivalents.
- Assess whether there are rules that are deviated from – or risks that the rules do not address?
- Outline a design team with the relevant competencies on board. The design team should consist of all stakeholders with competencies relevant for the safe operation of the project; this may include ship owner, yard, designer, Class/RO, end-user, sub-contractors and an appointed consultant (person or body) to facilitate the process. The latter must to the satisfaction of the DMA hold documented competencies (education and experience) with a view to managing risk based design. As approving authority, the DMA cannot be part of the design team, but need to participate as observer.
- Define the approval basis, incl. acceptance criteria, and agree on an outline of the approval process including expected extent of analysis, a tentative time plan and deliverables and for DMA to inform about cost associated with DMA's further approval of the project.

3. Analysis of preliminary design

Having agreed on the basis for the analysis, it is the task of the facilitator and the design team to carry out a preliminary analysis in order to identify main hazards and risks as well as main mitigating actions and hence the feasibility of the project. The facilitator and the design team lead the process with DMA as observers. The

¹ As per DMA's current [price list](#). The legal basis for charging appears in act no. 268 of March 28, 2013 "Act of payment for inspection of ships etc."

output should be a report with conclusions of the preliminary analysis and possible recommendations for further analyses that DMA can assess and provide a temporary approval for. The main objectives during this phase is to:

- Perform hazard identification: A brainstorm providing a list of hazards - exhaustive to the extent possible. The DMA shall be invited to participate in the design process and HAZID workshops.
- Summarize hazards into defining risks scenarios.
- Perform a qualitative analysis.
- Decide on provisional preliminary risk control options.
- Create a report with conclusions of the preliminary analysis

The report should at least include overall description of the alternative design, references to regulations affected, safety hazards involved and a preliminary risk assessment including interim proposals for mitigating measures.

The DMA will then, by an assessment of the preliminary results of the risk assessment and the facilitator's recommendations, provide a preliminary approval.

In simpler cases, the DMA may assess that the level of documentation obtained at this stage will be sufficient for final approval. However, normally the level obtained by preliminary approval will form basis for further refinement of analysis and development of the project towards final approval as described below.

4. Analysis of final design and approval

The further steps necessary to obtain final approval will typically be as follows:

- Facilitator and design team deploy further refinement of the analysis by further qualitative assessments, supplemented by quantitative analysis and physical tests, where deemed necessary. These refinements will typically take place as iterative steps.
- Facilitator and design team must in accordance with IMO MSC Circ. 1455 document analysis, results and recommendations in a final report and submit this to the DMA (or the RO on its behalf)
- A final survey including tests as deemed necessary on board the vessel by the DMA (or the RO on its behalf), for the verification of the full implementation of the result and conclusion of the design team's work shall be done.
- The DMA (or the RO on its behalf) will assess documentation and arrangements with a view to issuing a certificate and a statement of approval of the alternative and/or equivalent arrangement after approved final verification and test.
- Notification of the approved alternative or equivalent design shall be forwarded to the IMO and/or the EU-commission by the DMA.
- The conclusion of the risk assessment must include the future scope of survey, maintenance etc.
- When the analysis is complete and the systems have been tested and verified in practice, the DMA carries out a final survey and issues certificates after which the design is approved. As the current decision is based on the circumstances and understanding of the alternatives and equivalents, the approval may be adjusted or withdrawn until further notice should it subsequently turn out that there are significant safety issues or other determining factors that have not been sufficiently taken into account in the safety assessment. The project is then ready for operation and survey. Periodical survey by the DMA or RO on its behalf will be carried out according to the relevant regulation and

certificate for which the design is equivalent - and what the conclusion in the risk assessment may establish.

5. Subsequent evaluation

The project is evaluated after 1 year on basis of experiences gained.

Appendix – action overview

| | <u>Activity</u> | <u>Role of Submitter</u> | <u>Role of DMA</u> |
|---------------------------------------|--|---|---|
| Preliminary preview phase | Preview meeting/workshop Description of alternative: <ul style="list-style-type: none"> - General - Functional - Interfaces - GA/detail drawings - Risk assessment plans | Define | Arrange & review |
| | To what extent is analysis necessary? <ul style="list-style-type: none"> - New or well-proven technology/novel design? - Which rules are deviated from or lacking? | Propose | Decision – to be documented |
| Definition of approval basis | Define approval basis and evaluation criteria | Propose | Define approval basis - scope and evaluation criteria <ul style="list-style-type: none"> • Evaluation criteria by means of performance criteria characterizing the safety level of IMO regulations. • Verify safety performance equivalent to IMO requirements. |
| | Risk assessment plan <ul style="list-style-type: none"> • Assessment techniques • Evaluation criteria | Establish | Evaluate |
| | Qualification requirements <ul style="list-style-type: none"> • Design team • Facilitator | Propose | Evaluate |
| | | | |
| Analysis of preliminary design | Roadmap and facilitator | Facilitate all analysis agreed upon | Attend closely as observer |
| | HazId | Arrange HazId workshop Identify hazards and potential safeguards Submit report | Attend closely as observer |
| | Risk assessment | Assess: <ul style="list-style-type: none"> • Ranking and selection (Risk model) • Assumptions uncertainties • Assessment - reference design • Design casualty scenarios • Special issues – operational Submit report | Attend closely as observer |
| | | | |

| | <u>Activity</u> | <u>Role of Submitter</u> | <u>Role of DMA</u> |
|--|-----------------|--|--|
| Review of preliminary analysis | Review | | <p style="text-align: center;">Review:</p> <ul style="list-style-type: none"> • Hazld team • Hazld procedures • Hazards • Risk control measures |
| Preliminary approval | | <p style="text-align: center;">Provide:</p> <ul style="list-style-type: none"> • Description, specifications, functional requirements, operation and maintenance, health, safety and environmental issues, its interface with other systems, etc.; • preliminary drawings; • Codes and standards applied • Applicable administration requirements; • Hazld results; • Risk assessment plans/results, evaluation method, metrics and criteria • Design casualty scenarios • Testing and analyses plans • Special requirements • Description of the approval process | <p>Grant preliminary approval</p> <ul style="list-style-type: none"> • May not be until hazards, failure modes and control options are identified. • No "showstoppers" are identified, • Alternative is found feasible <p style="text-align: center;">May be granted conditionally wrt final approval</p> |
| Analysis of final design and approval | | <p style="text-align: center;">Provide:</p> <ul style="list-style-type: none"> • further qualitative assessments, supplemented by quantitative analysis and physical tests, where deemed necessary • Document analysis, results and recommendations in a final report in accordance with IMO MSC Circ. 1455 | <p style="text-align: center;">Assess and approve</p> <ul style="list-style-type: none"> • Documentation • Carry out final survey and test onboard • issue a certificate and a statement of approval |
| Subsequent evaluation | | Assess and provide experiences | Arrange and review |