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United States Coast Guard

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NAVIGATION AND VESSEL INSPECTION CIRCULAR NO. 01-22

Subj: ACCEPTANCE OF NOVEL LIFE-SAVING APPLIANCES AND ARRANGEMENTS

Ref:
(a) Title 46 of the Code of Federal Regulations (CFR) Subchapter A, Part 2 - Vessel Inspections
(b) Title 46 of the Code of Federal Regulations (CFR) Subchapter W, Part 199 - Lifesaving Systems for Certain Inspected Vessels
(c) International Convention for the Safety of Life at Sea (SOLAS) 1974, amended, Chapter III – Life-saving Appliance and Arrangements
(d) International Maritime Organization (IMO) Circular MSC.1/Circ.1212/Rev.1, Revised guidelines on alternative design and arrangements for SOLAS chapters II-1 and III
(e) Commandant Instruction 16000.7B, Marine Safety Manual Volume II, Section D, Chapter 7
(f) IMO Resolution A.520(13), Code of Practice for the Evaluation, Testing and Acceptance of Prototype Novel Life-saving Appliances and Arrangements

1. PURPOSE. This Navigation and Vessel Inspection Circular (NVIC) provides guidance to manufacturers and ship owners seeking acceptance of novel life-saving appliances (LSA) and arrangements under 46 CFR 199.40 on board a U.S. registered vessel subject to the International Convention for the Safety of Life at Sea (SOLAS), or a foreign flag passenger vessel seeking a Certificate of Compliance for the purpose of carrying a citizen of the United States as a passenger.

2. DISCLAIMER. This guidance is not a substitute for applicable legal requirements, nor is it itself a regulation. It is not intended to, nor does it impose legally-binding requirements on any party. It represents the Coast Guard's current thinking on this topic and is issued for guidance purposes to outline methods of best practice for compliance with the applicable law. You can use an alternative approach if the approach satisfies the requirements of the applicable statutes and regulations.

3. ACTION.

a. Officers in Charge, Marine Inspection (OCMI) and the Commanding Officer, Marine Safety Center (MSC) are encouraged to bring this circular to the attention of the marine industry and other marine interests within their areas of responsibility.

b. Manufacturers seeking U.S. Coast Guard (USCG) approval are encouraged to review the guidance contained in this NVIC to determine whether their equipment should be considered novel for the purposes of acceptance by the Office of Design and Engineering Standards, Commandant (CG-ENG) under 46 CFR 199.40(c) in lieu of approval.

c. Acceptance of an alternative design and arrangement for lifesaving systems involves cooperation between the equipment approval and vessel plan review processes. In accordance with current authorities for these processes, the USCG will evaluate novel LSA lifesaving appliances and arrangements in the following scenarios:

(1) For installation on a U.S. flag vessel, CG-ENG will consider an alternative design and arrangement that has undergone the analysis process under SOLAS Chapter III, Regulation 38 - Alternative Design and Arrangement (SOLAS III/38) and reference (d) under the provisions of 46 CFR 159.005-7(c) and 199.40(c)(2).

(2) For installation on a foreign flag passenger vessel carrying a citizen of the United States as a passenger which will undergo initial or subsequent Certificate of Compliance Plan Review as outlined in reference (e), the MSC will consider an alternative design and arrangement that has undergone the analysis process under SOLAS III/38.

d. Acceptance of a novel LSA or arrangement under this Circular should be based on the successful completion of the phases in Enclosure (1) for a U.S. flag vessel, or Enclosure (2) for a foreign flag passenger vessel.

4. DIRECTIVES AFFECTED. None.

5. BACKGROUND.

a. The USCG has statutory authority under Title 46, U.S. Code, Section 3306(a)(2) and (b)(1) to approve lifesaving equipment. The Life Saving and Fire Safety Division, Office of Design and Engineering Standards, Commandant (CG-ENG-4) carries out the approval of LSA under the requirements in 46 CFR Chapter I, Subchapter Q, (Equipment, Construction, And Materials: Specifications And Approval), and issues certificates of approval under Title 46 CFR Subpart 2.75 of reference (a).

b. 46 CFR 199.30 defines a novel lifesaving appliance or arrangement as “a lifesaving appliance or arrangement that has new features not fully covered by the provisions of this part but that provides an equal or higher standard of safety”. In lieu of type approval under 46 CFR 2.75, 46 CFR 199.40(c) allows CG-ENG to accept a novel lifesaving appliance or arrangement on board a U.S. flag vessel if it provides a level of safety equivalent to the requirements of reference (b).

c. Currently, 46 CFR 199.40(c)(1) allows CG-ENG to accept a novel lifesaving appliance or arrangement if it is evaluated and tested in accordance with reference (f). Additionally, 46 CFR 199.40(c)(2) allows CG-ENG to accept a novel lifesaving appliance or arrangement if it has successfully undergone evaluation and tests substantially equivalent to reference (f). However, reference (f) was removed from the text of SOLAS Chapter III in 2010 by IMO Resolution MSC.216(82).

d. In 2019, the IMO issued reference (d). The guidelines include goals and functional requirements to be taken into account when the performance criteria for the alternative design and arrangements of life-saving appliances cannot be determined directly from the prescriptive regulations of SOLAS Chapter III because of novel or unique features. The USCG intends to use reference (d) for evaluation of novel LSA.

e. In accordance with 46 CFR 2.01-25, before a U.S. flag vessel engaged in international voyages may be issued a Passenger Ship Safety Certificate or Cargo Ship Safety Equipment Certificate, it must meet the applicable requirements of reference (c). The issuance of these certificates includes an assessment whether the vessel was subject to SOLAS III/38. SOLAS III/38 provides a process for Flag States to evaluate novel lifesaving appliances and arrangements that may deviate from the prescriptive requirements of part B (regulations 6 through 37) of SOLAS III, provided they meet the intent of those requirements and provide an equivalent level of safety.

f. The USCG has statutory authority over foreign flag passenger vessels under Title 46, U.S. Code, Section 3505, which authorizes the Secretary under which the USCG operates to prevent a passenger vessel carrying U.S. citizen passengers from departing a U.S. port, if the Secretary finds that the vessel does not comply with SOLAS standards. The process by which the USCG carries out this responsibility is outlined in reference (e). As part of that process, the MSC conducts plan review of submitted documents for each foreign flag passenger vessel. When applicable, those documents should include supporting information for any equivalencies or exemptions approved by the flag Administration.

6. DISCUSSION.

a. Primary lifesaving systems are a critical component in the overall safety of life onboard the vessel. Vessel design and operations have improved significantly and enable the vessel itself to serve as its own best safety platform. That said, these same improvements place even greater emphasis on the need for primary lifesaving equipment to work successfully under the most difficult conditions—because its only when all else fails that this equipment will be used. As the USCG considers novel lifesaving arrangements, we will approach this from the perspective of ensuring that these systems make demonstrable improvements to the design, operation and reliability of primary lifesaving systems.

b. The USCG recognizes that under present regulations, the lifesaving "system" is generally approved as individual components on board U.S. flag vessels. With that in mind, a manufacturer of lifesaving equipment should consider carefully whether certain individual components comprising the novel system may be approved under the standards in 46 CFR

Subchapter Q. If the Original Equipment Manufacturer (OEM) intends to produce and market those individual components for conventional use on board U.S. flag vessels, they should then seek USCG type approval by following the conventional approval process in 46 CFR, subchapter Q, subparts 160.115, 160.132, 160.133, 160.135, 160.156, or 160.170, as appropriate.

c. The equipment manufacturer, or other appropriate submitter for a U.S. flag vessel subject to SOLAS considering the carriage of a novel lifesaving appliance or arrangement, should follow the steps outlined in enclosure (1) with the engineering analysis process in references (c) and (d). The analysis should take into account the goal, functional requirements and expected performance criteria, as set out in Appendix 5 of reference (d).

d. The submitter for a foreign passenger vessel which will undergo initial or subsequent Certificate of Compliance plan review considering the carriage of a novel lifesaving appliance or arrangement should follow the steps outlined in enclosure (2). In consultation with the vessel's flag Administration, the USCG will review and evaluate applicable engineering analyses and documentation required by SOLAS Chapter III, Regulation 38 where approval is required by the flag Administration of the alternative design deviating from the prescriptive requirements of SOLAS Chapter III. The successful technical review and processing for a USCG Certificate of Compliance will be heavily dependent on close engagement with the flag Administration.

7. ADDITIONAL CONSIDERATIONS. When considering the installation of a novel LSA or arrangement, the MSC should be contacted to discuss the review and approval of plans for the design, construction, or alteration of a U.S. flag vessel, or foreign flag passenger vessels under Certificate of Compliance plan review.

8. ENVIRONMENTAL ASPECT AND IMPACT CONSIDERATIONS.

a. The development of this NVIC and the general policies contained within it have been thoroughly reviewed by the originating office in conjunction with the Office of Environmental Management, Commandant (CG-47). This NVIC is categorically excluded under current Department of Homeland Security (DHS) categorical exclusion (CATEX) A3 from further environmental analysis in accordance with "Implementation of the National Environmental Policy Act (NEPA)", DHS Instruction Manual 023-01-001-01 (series).

b. This NVIC will not have any of the following: significant cumulative impacts on the human environment; substantial controversy or substantial change to existing environmental conditions; or inconsistencies with any Federal, State, or local laws or administrative determinations relating to the environment. All future specific actions resulting from the general policy in this NVIC must be individually evaluated for compliance with the National Environmental Policy Act (NEPA), Department of Homeland Security (DHS) and Coast Guard NEPA policy, and compliance with all other applicable environmental mandates.

9. DISTRIBUTION. No paper distribution will be made of this NVIC. An electronic version will be located at https://www.dco.uscg.mil/Our-Organization/NVIC/.

10. RECORDS MANAGEMENT CONSIDERATIONS. This NVIC has been thoroughly reviewed during the directives clearance process, and it has been determined there are no further records scheduling requirements, in accordance with Federal Records Act, 44 U.S.C . 3101 et seq., NARA requirements, and Information and Life Cycle Management Manual, COMDTINST M5212.12 (series). This policy does not create significant or substantial change to existing records management requirements.

11. FORMS/REPORTS. None.

12. REQUEST FOR CHANGES. All requests for changes and questions regarding implementation of this NVIC and/or requests for changes should be directed to contact CG-ENG-4 staff at TypeApproval@uscg.mil.

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J. W. Mauger
Rear Admiral, U.S. Coast Guard
Assistant Commandant for Prevention Policy

Encl: (1) Recommended Process for Acceptance of Novel Lifesaving Appliances and Arrangements on a US Flag Vessel
(2) Recommended Process for Acceptance of Novel Lifesaving Appliances and Arrangements on a Foreign Flag Passenger Vessel seeking a Certificate of Compliance

RECOMMENDED PROCESS FOR ACCEPTANCE OF NOVEL LIFESAVING APPLIANCES AND ARRANGEMENTS ON A U.S. FLAG VESSEL

1. **Phase 1 - Initial design assessment**:

   a. A manufacturer or other appropriate submitter for a vessel that desires to have an appliance or arrangement evaluated for acceptance as a novel life-saving appliance (LSA) in lieu of type approval on board a U.S. flag vessel should contact the U.S. Coast Guard (USCG) Life Saving and Fire Safety Division, Office of Design and Engineering Standards, Commandant (CG-ENG-4) at typeapproval@uscg.mil to communicate their intent. Other submitters may include the ship owner, ship yard, or RO for the vessel.

   b. An initial design assessment meeting should be scheduled with CG-ENG-4 staff to discuss the proposed design in general, and to provide a presentation of the broader design elements that differ from the prescriptive requirements in 46 CFR Subchapter Q, 46 CFR Subchapter W, the LSA Code, or SOLAS.

   c. If the system is to be installed on a specific vessel or class of vessels, and the details of how the system will be installed on those vessels is available, the submitter for the vessel should contact the USCG Marine Safety Center (MSC) at msc@uscg.mil to submit the details of the proposed installation. CG-ENG-4 and the MSC will coordinate their roles with the responsible parties.

2. **Phase 2 - Preliminary analysis**:

   a. If CG-ENG-4 agrees that the LSA system is novel, the submitter should perform the preliminary analysis outlined in section 5 of IMO Circular MSC.1/Circ.1212/Rev1, "Revised guidelines on alternative design and arrangements for SOLAS chapters II-1 and III" (MSC.1/Circ.1212), then submit the report detailed in section 5.5 to CG-ENG-4 for review.

   b. If the specific vessel or class of vessels is known at this point, this should be included in the scope of the analysis. CG-ENG-4 will coordinate with the MSC on the appropriate level of plan review.

   c. If not provided during the initial design assessment phase, the gap analysis should also be performed and submitted to CG-ENG-4 to identify the prescriptive requirements of SOLAS III and the LSA Code, as appropriate, that the submitter identifies the novel system does not meet.

   d. The USCG will evaluate the preliminary analysis and notify the submitter that it is acceptable, or will request further information.

3. **Phase 3 - Quantitative analysis**:

   a. If the USCG accepts the preliminary analysis, the submitter should perform the quantitative analysis of section 6 of MSC.1/Circ.1212 and submit the quantitative analysis to CG-ENG-4 for review.

   b. In this phase, the hazard identification process should identify all known critical systems and possible failure points or modes and include a robust failure modes, effects, and criticality analysis (FMECA) of the system with a goal of identifying and eliminating single points of failure. The submitter should perform multiple hazard identification analyses, one for the system and additional analyses specific to the installation or class of vessels.

   c. Risk analysis and casualty scenarios may focus on a generic system that would apply to any installation if a specific vessel is not identified. Later, when a specific ship is identified, further analysis should be performed to identify any specific risk and casualty scenarios unique to that particular vessel or class of vessels.

4. **Phase 4 - Performance criteria evaluation**:

   a. The submitter should ensure the components of the system or installation meet the functional requirements and expected performance criteria in Appendix 5 of MSC.1/Circ.1212 where they do not meet the prescriptive requirements of SOLAS Chapter III, the LSA code, or the applicable requirements of 46 CFR Subchapter Q, 46 CFR Subchapter W.

   b. The submitter should submit their evaluation of the design to Appendix 5 of MSC.1/Circ.1212 with respect to the prescriptive requirements outlined in paragraph 4(a) to CG-ENG-4 who will review the submission to SOLAS design standards, as well as applicable U.S. CFR standards. This review of the design of the system or equipment is distinct from the review of the installation on a specific ship.

   c. The USCG will notify the submitter whether the analysis of the system's compliance with the references in paragraph 4.a is accepted. If the USCG determines the submitter did not provide sufficient justification that the system meets the applicable functional requirements and expected performance criteria in Appendix 5 of reference MSC.1/Circ.1212, the submitter may respond with changes to the design or provide further justification of their findings.

   d. If the USCG ultimately determines the system cannot meet Appendix 5 of MSC.1/Circ.1212, the submitter will be notified that the system will not be accepted.

5. **Phase 5 - Testing**:

   a. If the submission under Phase 4 is accepted, CG-ENG-4 will develop a prototype test regimen and schedule in consultation with the submitter, taking into consideration the tests of IMO Resolution MSC.81(70) *Revised recommendation on testing of Life-saving Appliances* that should align with the novel system's components, and the gap analysis performed in previous phases. The submitter may submit their own prototype test regimen for consideration by CG-ENG-4.

   b. The submitter should also identify a USCG Accepted Independent Laboratory, as described in 46 CFR Part 159, at this phase or earlier, who will be selected to perform oversight of the production of the system on behalf of the USCG. CG-ENG-4 will notify the submitter if the selected Independent Lab is acceptable for the novel design. The Independent Laboratory should be prepared to submit a report consistent with 46 CFR Subpart 159.005-11 when they have witnessed the fabrication of any components of the system.

   c. In addition to prototype tests, the submitter should demonstrate the efficacy and reliability of the system and its major components, which may include such components as the launching appliance, embarkation devices, and craft.

   d. The submitter should submit for approval a reliability deployment schedule to satisfy CG-ENG-4 that the final design is sufficiently effective and reliable to support acceptance under 46 CFR 199.40. This should take into account known concerns and the risk analysis with the system.

   e. The submitter should invite USCG staff to attend testing with enough lead time to prepare travel arrangements, unless otherwise arranged with CG-ENG-4.

   f. Prototype testing should be documented in a manner similar to that of IMO MSC.1/Circ. 1628 through 1633 *Revised Standardized Test Forms* published by IMO, and all test forms should be signed and dated by the attending inspectors or other witnesses agreed to by CG-ENG-4.

6. **Phase 6 - Acceptance in principle**: If the system has passed the prototype tests in Phase 5, the USCG will issue a letter of acceptance to the submitter with the caveat that the novel LSA must receive subsequent approval for installation onboard a U.S. vessel to meet applicable carriage requirements. Acceptance in principle is not equivalent to a type approval and does not guarantee that the system will be accepted for use in an alternative design review under SOLAS III Regulation 38.

7. **Phase 7 - Case-by-case acceptance for carriage:**

   a. Once the system has received acceptance in principle, the submitter should perform the analysis under SOLAS Chapter III, Regulation 38 for installation on a specific vessel or class of vessels. The analysis should address the remaining requirements of Appendix 5 of MSC.1/Circ.1212 that are ship specific and that were not addressed

during the evaluation of the system. An additional hazard identification process as discussed in Phase 3 may be required.

b. This phase will be evaluated by the MSC in the course of vessel plan review required by the applicable subchapter. At a minimum, the submitter should be prepared to address the following elements:

   i. A risk analysis that takes into consideration the high concentration of survival craft within, and high volume of people evacuating from, a minimum number of main vertical zones;

   ii. A robust and sufficient evacuation plan following the guidance in IMO MSC.1/Circ.1533 "Revised Guidelines on Evacuation Analysis for New and Existing Passenger Ships," tailored to the specific vessel or class of vessels;

   iii. A reliability schedule for continued confidence in the system that addresses training, maintenance, and efficacy post-installation. This should be forwarded to CG-ENG-4 for concurrent review and acceptance. This schedule should address at least the following:

      1. Live, full-scale deployment schedule to be submitted for approval. A schedule should clearly address at a minimum: a clear definition of "deployment" including how many parts/components of the system should be exercised to demonstrate a deployment; how often to deploy an installed system; and how a delay in the schedule will impact safety/risk;

      2. A detailed training plan that addresses: how training should take place; when training should take place; and who should receive the training. The plan should provide a training process that is at least as equivalent to the requirements in SOLAS Chapter III, taking into consideration the following:

         a. Alternatives may be needed for SOLAS Chapter III, Regulations 19.3.4.1.5, 19.3.4.2 and 19.3.4.3;
         b. Performance-based training cycle with built-in performance assessments should be established to verify the assigned crewmembers successfully performed the training;
         c. Training should be "hands-on" and should include, at a minimum: launching the system, loading to craft, crowd control, communication, propulsion and control systems, stability assessment, recovery of a person in the water, and maneuvering;
         d. Additional shipboard or land-based training may be established that is virtual or simulated, but still maximizes hands-on, active involvement and avoids simple lectures and watching videos; and
         e. The training plan will be subject to continued demonstration of compliance and should be incorporated into the ship's Safety Management System.

iv. A maintenance plan that is at least as equivalent to the requirements in SOLAS Chapter III taking into account the following:

1. Identifies what is and is not compliant with SOLAS Chapter III, Regulation 20;

2. Explains how the crew and service providers will gain and maintain competencies with operating and maintaining the equipment and/or system, taking into consideration enclosure (2) of Navigation and Vessel Circular 03-19, "Maintenance, Through Examination, Operational Testing, Overhaul and Repair of Lifeboats and Rescue Boats, Launching Appliances and Release Gear;"

3. Determines the special training and maintenance requirements associated with the novel system to ensure a level of safety equal to or greater than those required by the applicable requirements of SOLAS Chapter III.

8. **Phase 8 - Final acceptance**: The USCG will grant acceptance in the form of a letter upon successful demonstration of the full system on board the vessel. The letter indicates the novel lifesaving appliance or arrangement has been accepted under 46 CFR 199.40(c) as providing a level of safety equivalent to the requirements of 46 CFR part 199. Final authority to accept the installation and carriage on board rests with the cognizant Officer in Charge, Marine Inspection who issues the vessel's Certificate of Inspection.

RECOMMENDED PROCESS FOR ACCEPTANCE OF NOVEL LIFESAVING APPLIANCES AND ARRANGEMENTS ON A FOREIGN FLAG PASSENGER VESSEL SEEKING A CERTIFICATE OF COMPLIANCE

1. **Phase 1 - Initial design assessment**:

   a. For a foreign flag passenger vessel seeking a Certificate of Compliance (COC) that intends to install a novel appliance or arrangement, the U.S. Coast Guard (USCG) should be considered an "interested party" as described in paragraph 1.1.4 of IMO Circular MSC.1/Circ.1212/Rev1 "Revised guidelines on alternative design and arrangements for SOLAS chapters II-1 and III" (MSC.1/Circ.1212).

   b. The submitter should contact the USCG Marine Safety Center (MSC) at msc@uscg.mil to communicate their intent as part of the concept review process outlined in Commandant Instruction 16000.7B, Marine Safety Manual Volume II, Section D, Chapter 7 (MSM Vol II Ch. 7). The MSC and the USCG Life Saving and Fire Safety Division, Office of Design and Engineering Standards, Commandant (CG-ENG-4) will coordinate as needed throughout the review process.

   c. The submitter should request an initial design assessment meeting with MSC staff to discuss the proposed design and installation in general, and a presentation of the broader design elements that differ from the prescriptive requirements in SOLAS Chapter III or the IMO LSA Code. The initial design assessment presentation may be scheduled in conjunction with the concept review meeting as outlined MSM Vol II Ch. 7. The vessel's flag state should be represented at the initial design assessment meeting.

   d. The submitter should be prepared to discuss the status of approval by the flag state of the novel appliance or arrangement under SOLAS Chapter III, Regulation 4.3 and the status of acceptance by the flag state of the vessel under SOLAS Chapter III, Regulation 38. If these approvals are finalized, the documentation from the flag state supporting the approval of the novel appliance or arrangement should be provided. Approval from the flag state does not guarantee acceptance by the USCG, but is an important component to the USCG review process.

2. **Phase 2 - Preliminary analysis**:

   a. MSC will request a copy of the preliminary analysis outlined in section 5 of MSC.1/Circ.1212, and the flag state's response.

   b. If not provided during the initial design assessment phase, the gap analysis should also be performed and submitted to the MSC to identify the prescriptive requirements

of SOLAS Chapter III and the LSA Code, as appropriate, that the submitter identifies that the novel system does not meet.

c. The USCG will review the preliminary analysis, gap analysis if available, along with the flag state's response, and notify the submitter if any further information or clarification is requested.

3. **Phase 3 - Quantitative analysis**:

a. When complete, the submitter should submit the quantitative analysis of section 6 of MSC.1/Circ.1212, and the response from the flag state, to MSC.

b. In this phase, the hazard identification process should identify all known critical systems and possible failure points or modes. The USCG seeks a robust failure modes, effects, and criticality analysis (FMECA) of the system with a goal of identifying and eliminating single points of failure. The submitter should perform multiple hazard identification analyses, one for the system and additional ones specific to the installation or class of vessels.

c. Specific risk and casualty scenarios unique to that particular vessel or class of vessels should be identified.

d. The USCG will review the quantitative analysis along with the flag state's response, and notify the submitter if any further information or clarification is requested.

4. **Phase 4 - Performance criteria evaluation**:

a. The flag state should ensure the components of the system or installation meet the functional requirements and expected performance criteria in Appendix 5 of MSC.1/Circ.1212 where they do not meet the prescriptive requirements of SOLAS Chapter III and the LSA code. This step may be completed in conjunction with any of the previous phases above.

b. If not already submitted in an earlier phase, the submitter should submit their evaluation of the design to Appendix 5 of MSC.1/Circ.1212 with respect to the prescriptive requirements outline in paragraph 4.a to the MSC for review.

c. The USCG will review the evaluation, and any flag state response, and notify the submitter if any further information or clarification is requested. If the USCG determines the submitter did not provide sufficient justification that the system meets the applicable functional requirements and expected performance criteria in Appendix 5 of MSC.1/Circ.1212, the submitter will be notified and provided an opportunity to respond with changes to the design or to provide further justification of their findings.

d. If the USCG determines the system cannot meet Appendix 5 of MSC.1/Circ.1212, the submitter will be notified that the system will not be considered for installation on a vessel seeking a COC.

5. **Phase 5 - Testing**:

a. If the USCG accepts the evaluation to Appendix 5 of MSC.1/Circ.1212, MSC will request a copy of the planned prototype test regimen and schedule. The USCG may request to attend any prototype testing. Therefore, the submitter should arrange testing with enough lead time to prepare travel arrangements, unless other arrangements are made.

b. In addition to prototype tests, the submitter should demonstrate the efficacy and reliability of the system and its major components, which may include such components as the launching appliance, embarkation devices, and craft.

c. The submitter should submit for acceptance a reliability deployment schedule to MSC. The schedule should demonstrate that the final design is sufficiently effective and reliable to support installation on a foreign passenger vessel holding a COC. This should take into account known concerns and the risk analysis of the system.

d. The USCG may request copies of the results of any prototype testing of the novel system.

e. If the system passes the prototype tests, the responsible parties should submit copies of the flag state approval when available. The novel LSA must still receive subsequent approval for installation onboard the foreign flag passenger vessel by the flag state in order for the vessel to meet applicable carriage requirements. This does not guarantee that the system will be accepted by the USCG for use in an alternative design review under SOLAS Chapter III, Regulation 38, nor does it guarantee the issuance of the COC.

6. **Phase 6 - Ship-specific risk analysis:**

a. The submitter should ensure the analysis under SOLAS Chapter III, Regulation 38 for installation on a specific vessel or class of vessels is completed and submitted to the MSC for review. The analysis should address the remaining requirements of Appendix 5 of MSC.1/Circ.1212 that are ship specific if not already addressed during the evaluation of the system. Therefore, an additional hazard identification process as discussed in Phase 3 may be required.

b. The submitter should be prepared in this phase to address the following elements:

i. A risk analysis that takes into consideration the high concentration of survival craft within, and high volume of people evacuating from, a minimum number of main vertical zones;

ii. A robust and sufficient evacuation plan following the guidance in IMO MSC.1/Circ.1533 "Revised Guidelines on Evacuation Analysis for New and Existing Passenger Ships," tailored to the specific vessel or class of vessels;

iii. A reliability schedule for continued confidence in the system that addresses training, maintenance, and efficacy post-installation. This schedule should address at least the following:

1. Live, full-scale deployment schedule to be submitted for approval. A schedule should clearly address at a minimum: a clear definition of "deployment" including how many parts/components of the system should be exercised to demonstrate a deployment; how often to deploy an installed system; and how a delay in the schedule will impact safety/risk;

2. A detailed training plan that addresses: how training should take place; when training should take place; and who should receive the training. The plan should provide a training process that is at least as equivalent to the requirements in SOLAS Chapter III taking into consideration the following:

   a. Alternatives may be needed for SOLAS Chapter III, Regulations 19.3.4.1.5, 19.3.4.2 and 19.3.4.3;
   b. Performance-based training cycle with built-in performance assessments should be established to verify the assigned crewmembers successfully performed the training;
   c. Training should be "hands-on" and should include, at a minimum: launching the system, loading to craft, crowd control, communication, propulsion and control systems, stability assessment, recovery of a person in the water, and maneuvering;
   d. Additional shipboard or land-based training may be established that is virtual or simulated, but still maximizes hands-on, active involvement and avoids simple lectures and watching videos; and
   e. The training plan will be subject to continued demonstration of compliance and should be incorporated into the ship's Safety Management System.

iv. Maintenance plan that is at least as equivalent to the requirements in SOLAS Chapter III taking into account the following:

1. Identifies what is and is not compliant with SOLAS Chapter III, Regulation 20;

2. Explains how the crew and service providers will gain and maintain competencies with operating and maintaining the equipment and/or system, taking into consideration enclosure (2) of Navigation and Vessel Circular 03-19, "Maintenance, Through Examination, Operational Testing, Overhaul and

Repair of Lifeboats and Rescue Boats, Launching Appliances and Release Gear;" and

3. Determines the special training and maintenance requirements associated with the novel system to ensure a level of safety equal to or greater than those required by the applicable requirements of SOLAS Chapter III.

7. **Phase 7 - Final acceptance**:

a. Once the USCG has accepted the analysis under SOLAS Chapter III, Regulation 38 in Phase 6, the vessel's submitter should expect that a full successful demonstration of the system will be part of the Initial or subsequent COC exam for acceptance by the cognizant OCMI. Periodic or cause-based demonstrations of the system may be required during subsequent COC examinations.

b. During the initial and any subsequent COC examination, the vessel's submitter should be prepared to provide approval documentation, issued by the Flag Administration for alternative designs under SOLAS Chapter III, Regulation 38, to any USCG Port State Control officer, upon request.