



REVIEW OF CURVED OR WINDING STAIRS IN THE ESCAPE PATH

Procedure Number: SOLAS-01

Revision Date: January 22, 2024

Z. B. ROBERTSON, LCDR, Chief, Hull Division

Purpose

The purpose of this Plan Review Guideline (PRG) is to provide clear guidance for SOLAS passenger ships with curved stairways that are a part of the emergency evacuation plan.

Contact Information

If you have any questions or comments concerning this document, please contact the Marine Safety Center (MSC) by e-mail or phone. Please refer to Procedure Number SOLAS-01.

E-mail: msc@uscg.mil

Phone: 202-795-6729

Website: www.dco.uscg.mil/msc

1. Applicability

This PRG is applicable to SOLAS passenger vessels.

2. References

SOLAS II-2/13.3.2.4.5, “The widths, number and continuity of escapes shall be in accordance with the requirements in the Fire Safety Systems (FSS) Code.”

FSS Chapter 13.2.1.1, “Stairways shall not be less than 900 mm in clear width.”

FSS Chapter 13.2.2.2, “All stairways sized for more than 90 persons shall be aligned fore and aft.”

FSS Chapter 13.2.2.3, “Stairways shall not exceed 3.5 m in vertical rise without the provision of a landing and shall not have an angle of inclination greater than 45°.”

MSC.1/Circ. 1238, “Guidelines for Evacuation Analysis for New and Existing Passenger Ships”

3. Background

The evacuation analysis contained in MSC.1/Circ. 1238 relies on factors derived from land-based buildings where there are specific requirements on uniformity of tread depth on stairs. Winding or curved stairs, where the tread is not a rectangular shape, as well as triangular landings create a situation where depending on the design, the speed of travel on the stair can be significantly impaired. The slope of the stair where the tread is narrow can also greatly exceed the limit of 45° of FSS Chapter 13.2.2.3. The result is a stair that may be difficult for people to use with an effective useable width that is significantly less than the measured clear width. The speed of travel along this type of stair in an emergency evacuation scenario depends heavily on the actual design and requires careful analysis beyond that required for traditional stairs.

4. Guidance

- Stairways serving more than 90 persons shall be aligned fore and aft, with no curved stairs or steps on landings permitted.
- Stairways serving 90 persons or fewer shall be at least 900 mm in clear width. They may be curved or have irregular tread shapes, but the clear width must only include portions of the tread where the angle of inclination does not exceed 45°.
- Any stair used as a means of escape that does not meet the above requirements must undergo an engineering analysis in accordance with the requirements of SOLAS II-2/17 to determine the appropriate correction to the factors used in the evacuation analysis contained in MSC.1/Circ.1238, Appendix 1, sections 1.3 and 1.4.

5. Disclaimer

This guidance is not a substitute for applicable legal requirements, nor is it itself a rule. 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 may assist industry, mariners, the general public, and the Coast Guard, as well as other federal and state regulators, in applying statutory and regulatory requirements. You can use an alternative approach for complying with these requirements if the approach satisfies the requirements of the applicable statutes and regulations. If you want to discuss an alternative, you may contact MSC, the unit responsible for implementing this guidance.