

46 CFR SUBCHAPTER S SUBDIVISION AND STABILITY

1989 NPRM

Subchapter S currently contains the subdivision and stability rules for all inspected vessels including small passenger vessels. This proposal moves most of the stability and seaworthiness requirements for small passenger vessels from Subchapter S into Subchapter T for the purpose of consolidating most regulations applicable to small passenger vessels into one inspection subchapter. The intact stability, subdivision, and damage stability standards for small passenger vessels that are more than 65 feet in length, carrying more than 150 passengers, carrying 12 or more passengers on an international voyage, or have more than one deck above the bulkhead deck exclusive of the pilot house would remain in Subchapter S to avoid duplication of the requirements which are also applicable to other inspected vessels. Additionally, the intact stability requirements for small passenger vessels propelled by sail would remain in Subchapter S.

The proposal also revises some of the existing regulations applicable to small passenger vessels, which would remain in Subchapter S, to reflect current Coast Guard policy. The proposed changes in Subchapter S only effect small passenger vessels and sailing school vessels, which are presently required to comply with the stability criteria for small passenger vessels propelled by sail. Other changes to existing regulations in Subchapter S will be addressed under another regulatory docket in the future.

Specific proposed changes to Subchapter S are discussed below in this section of the preamble. Changes to regulations proposed to be moved from Subchapter S to Subchapter T are discussed in the sections of this preamble entitled *Part 178-Intact Stability and Seaworthiness*, and *Part 179-Subdivision, Damage Stability and Seaworthiness*.

1994 SNPRM

Many of the comments received concerning subdivision and stability requirements discussed the effects of the changes proposed in the NPRM, or suggested additional changes, which would affect other classes of vessels, such as passenger vessels of at least 100 gross tons and offshore supply vessels. The Coast Guard Marine Technical and Hazardous Materials Division is currently reviewing stability requirements for all types of vessels under a project entitled "General Revisions to Stability Regulations" [CGD 89-036]. The changes proposed in the NPRM to some sections of subchapter S (§§ 170.090, 170.170, 170.173, 171.050, 171.055, 171.070, 171.076, 171.077, and 171.080) are now being evaluated under the stability revisions project so that the effect that any proposed changes might have on other types of vessels can be considered. Therefore, these proposed changes to subchapter S have been removed from the small passenger vessel SNPRM. All comments received on the applicable subchapter S sections will be considered in the development of proposed rules under the stability revisions project. The Coast Guard anticipates that an NPRM for the stability revisions project will be published this year.

Since publishing the NPRM, the Coast Guard Marine Technical and Hazardous Materials Division has also amended this subpart under a project entitled "Stability Design and Operational Regulations" [CGD 89-037]. These amendments included requirements for stability verification and logging, loading door closure and logging, hull

markings, periodic lightship verification, and residual stability for new passenger vessels. These changes were published in a final rule on September 11, 1992, and except for the periodic lightship verification requirements, were effective on December 10, 1992. The effective date of the lightship verification requirements was indefinitely suspended, and is not included in this SNPRM. A comment period was reopened relative to these requirements, with revised amendments due to be published in the near future. The remaining amendments have been incorporated into the SNPRM.

Part 170--Stability Requirements for All Inspected Vessels

1994 SNPRM

One comment proposed that naval architects be allowed to review and certify a vessel's stability as an alternative to Coast Guard review. The Coast Guard disagrees with this proposal. Because of the importance of small passenger vessel stability and subdivision, the Coast Guard has not delegated this function to any classification society or other party. No change was made to the NPRM.

One comment suggested that when evaluating damaged stability, it is inappropriate to limit the maximum draft based on floodable length. Floodable length calculations only need to be done at the same draft and trim as damaged stability and it is often a less severe criteria than damaged stability requirements. No changes were made to the NPRM.

Section 170.001 Applicability

1989 NPRM

Proposed § 170.001 revises the applicability of Subchapter S so that only vessels contracted for on or after the effective date of the final rules under this docket would have to comply with the proposed changes to the subchapter. Vessels contracted before that date may be constructed in accordance with the regulations in effect on the date of the signing of the contract.

Section 170.050 General Terms

1994 SNPRM

One comment suggested amending the definition of “partially protected waters” to be the same as in proposed § 175.400. The Coast Guard has determined that since this change would affect vessels other than small passenger vessels, implementing the suggestion would go beyond the scope of this project. No change was made to the NPRM.

Section 170.055 Definitions Concerning a Vessel

1989 NPRM

Section 170.055(h)(1) Definition of LBP. The proposed addition to existing § 170.055(h)(1) allows the Commanding Officer of the Coast Guard Marine Safety Center to include large underwater projections, such as bulbous bows, in the LBP (length between perpendicular) of a small passenger vessel. Inclusion of such underwater projections is necessary in determining watertight bulkhead spacing to better reflect the increased length of a vessel below the waterline and the actual possibility of damage below the waterline. Projections which contribute more than 2% of the underwater volume of the vessel are normally included in the LBP. Few small passenger vessels are expected to have such projections.

The title, "Commanding Officer, U.S. Coast Guard Marine Safety Center," is used in the proposed change to § 170.055(h)(1), other proposed revisions in Subchapter S, and in Parts 177, 178, and 179 of the proposed Subchapter T. When the Coast Guard Merchant Marine Technical Offices (mmt) were disestablished in 1986, the responsibilities of the Commander (mmt) were transferred to the Commanding Officer of the Coast Guard Marine Safety Center. However, the title, "Commander (mmt)," used in sections of Subchapter S which are not addressed in this proposal, will not be replaced with the title, "Commanding Officer, U.S. Coast Guard Marine Safety Office " at this time.

1994 SNPRM

The proposed rule would allow the Marine Safety Center (MSC) to include underwater projections in the value of "length between perpendiculars (LBP)" to make the application of stability criteria better reflect the buoyancy distribution of a vessel. One comment suggested using a new term to describe the length of a vessel that would include large underwater projections, rather than modifying the definition of LBP. The Coast Guard disagrees because another definition for length would make the regulations more complicated. The use of the term LBP within subchapter S, in sections applicable to small passenger vessels, is sufficient to determine volumes subject to flooding. In these cases, a modified definition of LBP should not create confusion.

The proposed definition of a "small passenger vessel" eliminates those vessels carrying six or less passengers and came from the law (46 U.S.C. 2101(35)). One comment suggested that due to this definition, all small passenger vessels would have to comply with part 170 on stability, and that this would require even small passenger vessels of not more than 65 feet in length to have inclining and hydrostatic curves drawn by a naval architect. This is not true. Proposed § 178.310 permits an owner of a vessel, with only a limited knowledge of stability, to perform a simplified stability proof test, which can be conducted under the supervision of the Coast Guard. The cognizant OCMI has the discretion to determine that certain vessels carrying not more than 49 passengers are not required to undergo this test. Section 178.310 also specifically identifies which vessels must meet subchapter S criteria and which sections are applicable. No changes were made to the NPRM.

Section 170.090 Assumed weight and vertical center of gravity of each person.

1989 NPRM

Proposed paragraphs (c) and (d) contain standard values to be used for the vertical center of gravity, weight, and location of passengers when performing loading calculations. This proposal incorporates Coast Guard policy which uses the average weight and center of gravity for a standing adult. The absence of such values in existing regulations results in inconsistencies among naval architects designing small passenger vessels.

Sections 170.105(b)(1) and 170.160(b)(1) Small vessel exclusion.

1989 NPRM

The text of existing §§ 170.105(b)(1) and 170.160(b)(1) is deleted because the applicable requirements for the vessels addressed there have been placed in proposed Subchapter T.

Section 170.170 Calculations required.

1989 NPRM

Inclusion of rails and canopies in the projected lateral area, and permitting the angle of heel to the deck edge on sailing vessels.

The proposed changes to the definitions of certain parameters in the metacentric height formula in existing § 170.170 incorporate long-standing policy. That policy interprets the projected area of a small passenger vessel as including any areas of the vessel profile which can be fitted with canvas, such as railings or canopies. The current regulations do not address this point although the Coast Guard has applied this interpretation as a practical matter. Railings and canopies must be included in the projected area because they are frequently blocked off with canvas dodgers or plastic wind screens to protect passengers.

Some small passenger vessels that are sailing vessels have had to limit the number of passengers they can carry because the angle of heel when applying the criteria for metacentric height (GM) in existing § 170.170 is presently limited to one-half of the freeboard of a vessel including a sailing vessel. The existing criteria were initially developed for flush deck, mechanically powered vessels of ordinary proportions and form that carry cargo below the main deck. The proposed rules allow sailing vessels to be heeled up to the deck edge when applying the criteria in § 170.170 because a sailing vessel normally has a greater range of stability and a greater angle of downflooding than the type vessel for which the criteria were initially developed.

1996 IFR

The Coast Guard has adjusted the angle of heel permitted for sailing vessels when determining the minimum required metacentric height. Because the vessel's angle of heel is limited to one-half of the freeboard of the vessel when applying the criteria for metacentric height (GM) in existing § 170.170, some sailing vessels have had to limit the number of passengers they can carry. The existing criteria were initially developed for mechanically powered vessels that were of ordinary proportions and form, with flush decks, and carried cargo below the main deck. The changes in the IFR will allow sailing vessels to be heeled up to the deck edge, or to a maximum heel of 14 degrees, whichever is less, because a sailing vessel has a greater range of stability and a greater angle of downflooding than the type of vessel for which the criteria were initially developed.

Section 170.173 Criterion for vessel of unusual proportion and form

1989 NPRM

The proposed changes to existing § 170.173 allow, for the purpose of consistency, the same righting energy criteria that has been applied to vessels of unusual proportion and form in the past to be used as an alternative for small passenger vessels. A Coast Guard policy allowing the relaxation of requirements for vessels that operate only on protected waters is also formalized in this proposal. The proposed criteria have histories of satisfactory results and recognize that vessels can be safely operated on protected routes with less stability than is required for exposed routes. As these relaxations have been routinely allowed as a matter of policy, there will not be a monetary benefit from this regulation change.

1996 IFR

One comment stated that the word "maximum" should be deleted from paragraph (b)(2) of § 170.173 because it is misleading. The Coast Guard agrees and has made this change for the IFR.

1997 Final Rule

One comment recommended that this section be revised to incorporate intact stability standards and policy (NVICs, PFMs, and MTNs) currently used by the MSC for vessels that operate on protected and partially protected waters.

The Coast Guard agrees. Criteria used successfully in the past and listed in MSC's PFM 1-89 are incorporated into this rule.

Section 170.210 Lightweight verification

1996 IFR

Two comments to this part addressed the periodic lightweight survey requirements contained in § 170.210, which were suspended on December 10, 1992 [57 FR 58406]. The comments stated that paragraph (e) of § 170.210 would have to be modified if the regulation is reinstated. The Coast Guard agrees. After a comprehensive review of all the current regulation projects, the Coast Guard decided to withdraw the lightweight survey project, along with selected other projects, and focus its available resources on higher priority projects. Since the suspended lightweight survey requirements will not be reinstated in the near future, no changes are required in this section at this time.

Section 170.255 Class 1 Doors; Permissible Locations

1994 SNPRM

This section of the existing regulations contains requirements for Class 1 watertight doors. In the NPRM, no changes to the existing regulations were proposed. Requirements for watertight doors on small passenger vessels were proposed in § 179.330 of the NPRM. One comment suggested current policy on watertight doors should be included in existing § 170.255 and that the requirement for an open/closed indicator in existing § 170.255(e) should apply to class 2 and 3 doors as well. The Coast Guard disagrees.

Current policy is being included in proposed Sec. 179.330, which applies existing Sec. 170.255 to small passenger vessels. Remote indicators are already required for class 2 and class 3 doors by existing § 170.270(d). No change has been made to the NPRM.

Section 170.265 Class 3 doors; required locations.

1996 IFR

The Coast Guard's revision to § 170.265(d)(2) corrects errors that occurred when 46 CFR 73.35-15(d) was redesignated as subchapter S. The factor of subdivision value was incorrectly stated as 0.05 instead of 0.5.

Section 170.270 Door design, operation, installation, and testing.

1996 IFR

The revisions to paragraph (d) specify circumstances when watertight door indicators are required under § 170.255(e). The change is consistent with § 179.330(b) in the IFR.

Part 171--Special Rules Pertaining to Vessels Carrying Passengers

1989 NPRM

Subpart B "Small Vessels." Subpart B is proposed to be deleted. The simplified stability test for sailing vessels in § 171.035 of existing Subpart B does not consider the full range of stability that a sailing vessel has as it heels to the downflooding or extremis angle. Even in protected and partially protected waters, there are squalls that arise quickly that can cause a sailing vessel to heel further than its deck edge. The Coast Guard believes that the sailing vessel criterion of existing § 171.055 or § 171.057 should be used to check all sailing vessels, regardless of their size, for their full range of stability.

The remainder of the provisions of Subpart B are contained in proposed Part 178 of Subchapter T.

1997 Final Rule

Public comments brought to the Coast Guard's attention that certain sections regarding bulkhead penetrations, watertight integrity, and deck drainage for vessels less than 100 gross tons had mistakenly been deleted from subchapter S. The Coast Guard has determined that the error occurred during the creation of subchapter K. When the NPRM was published in 1989, the Coast Guard proposed that the stability requirements in subchapter S for vessels less than 100 gross tons be moved back into subchapter T for the convenience of the reader. The proposal also involved the removal of redundant language in subchapter S. When subchapter K was proposed in the 1994 SNPRM, language was added to part 116 requiring subchapter K vessels to meet applicable stability standards in subchapter S with some exceptions noted in subpart K of part 116. However, the proposed revisions to subchapter S deleting certain requirements for vessels of less than 100 gross tons were not removed from the rulemaking document. In February, 1997, the MSC sent out bulletin 01-97 to naval architects, designers, and boat builders throughout the United States explaining the error and providing interim guidance until publication of the final rule. The Coast Guard has amended part 171 in this final rule by reinstating §§ 171.110, 171.114, 171.115, 171.119, 171.120, 171.122, 171.124, 171.130, 171.140, 171.145, 171.150, and 171.155 as published in the October 1, 1995 edition of 46 CFR parts 166 to 199. The Coast Guard apologizes for any confusion this error may have caused to the small passenger vessel industry.

Section 171.010 Definitions

1994 SNPRM

One comment suggested amending the definition of "ferry" in § 171.010(d) to be the same as § 175.400 of the proposed rule. The proposed rules defined "ferry" in § 175.400, using the definition in existing § 175.10-9, except that the clause "having provisions only for deck passengers and/or vehicles" was inadvertently left out. The Coast Guard agrees that definitions should be consistent, if possible. "Ferry" is also defined in 46 CFR subchapter H, "Passenger Vessels", which uses the same definition as existing subchapter T. The definition of ferry in § 175.400 has been changed to what it is in the existing regulation and is now consistent with subchapter H. The definition of ferry in § 171.010(d) has been changed to be consistent with the other subchapters by changing the

wording concerning routes in (d)(1) and adding the phrase “short runs” to (d)(3). It is of particular importance to note that the only passengers allowed on ferries are “deck passengers.” The term deck passenger generally refers to a passenger for whom no berthing or other accommodation is provided, other than the freedom to occupy allotted deck space, as opposed to cabin passengers. Deck passage is usually limited to short voyages. Berthing is important for stability because berthed passengers sleep in closed compartments. The standard of subdivision for a ferry is much less than that applicable to other passenger vessels. This trade-off demands much less risk, in the form of awake and alert passengers and easy escape routes.

Section 171.035 Intact Stability Requirements for a Sailing Vessel or an Auxiliary Sailing Vessel

1994 SNPRM

The proposed rule would have deleted §. 171.035, removing the provisions for a simple proof test for initial stability, taking the position that a simplified analysis of the intact stability was not sufficient for sailing vessels. This would have required the stability of all sailing vessels to be analyzed with the procedures applicable to larger sailing vessels. Four comments expressed reservations with the complete elimination of § 171.035, and questioned if it was intended to subject all sail and auxiliary sail vessels to the requirements for large sail vessels, including inclining experiments.

Since the NPRM was published, the Coast Guard has performed a stability study on sailboats of not more than 65 feet in length. The results showed that the simplified proof test is sufficient for typical arrangements (decked vessels with a cockpit no longer than 0.2L), and ensures a level of safety similar to a more formal analysis, provided downflooding openings are well inboard. Therefore, the requirements in existing § 171.035 have been retained, but placed in new § 178.325.

Section 178.325 contains revised descriptions of hull forms for which the simplified evaluation procedures are not sufficient to ensure that small vessels are stable. The inclusion of this section was most easily and logically made by making some changes and additions concerning sail and auxiliary sail vessels to proposed §§ 178.310 (a) and (b)(2), and inserting a new § 178.330(e) concerning applicability and procedures for simplified stability proof tests. The term “self-bailing cockpit”, which is used in proposed § 178.325(d) of this SNPRM, is defined in proposed § 175.400. Proposed § 171.045(f), which would have required all small passenger vessels which are sailing vessels to meet large vessel stability criteria, has been removed.

Section 171.050(b) Rail crowding criteria.

1989 NPRM

Proposed § 171.050(b) incorporates existing policy for vessels, used for excursions such as to view parades or for sightseeing on which a large number of passengers may move to the railings for better viewing. The passenger criteria in existing § 171.050 considers passenger heeling but not to the extent considered by this proposal. Technical evaluation has shown that vessels affected by this proposal are capable of being loaded in manners not adequately addressed by current criteria. Compliance with the proposed

requirement would probably result in the stability analysis required for certification taking an additional hour of time.

Sections 171.055 (d)(1), (d)(2), (e)(4)(ii), and (g)(1) Small passenger sailing vessels.

1989 NPRM

The existing sailing vessel stability criteria have been criticized by many naval architects and sailors as being too stringent for small vessels because they make such vessels difficult to maneuver in light air. Similar to the sailing school vessel regulations, the proposed regulations in § 171.055 contain graphs so that the stability numerals can be reduced in exchange for higher angles of downflooding and vanishing stability. These proposed regulations do not impose any additional costs. Under the proposal small passenger vessels which are sailing vessels have the option of using the existing criteria or the new criteria. Some vessels may benefit from the proposed changes since they may be able to carry more sail or be more maneuverable using the proposed criteria.

Section 171.057 Intact Stability Requirements for a Sailing Catamaran

1994 SNPRM

The proposed rules did not address § 171.057. One comment suggested modifying the required heeling moment to account for sail rigs which have a headsail that goes only part way up the mast. The Coast Guard agrees. Recent advances in the design of catamaran mast and sail arrangements have resulted in designs which are unduly penalized because they have a higher than normal mast and use sails that do not go all the way to the masthead. The formulas in this section have been modified to use the height of the center-of-effort of the sail plan rather than the height of the mast. This approach is more realistic than using a height coefficient and more in keeping with the requirements for monohull sailing vessels.

Section 171.070 (e)(1) and (e)(2) Spacing of main watertight bulkheads.

1989 NPRM

The proposed revisions to § 171.070 state that a small passenger vessel carrying more than 12 passengers on an international voyage must comply with the existing regulations indicated. This change incorporates requirements of the International Convention for Safety of Life at Sea, 1974, which small passenger vessels on an international voyage must comply with. Consequently, there are no costs resulting from this proposed change.

Section 171.076 Bottom damage requirements for longitudinally subdivided vessels.

1989 NPRM

Proposed § 171.076 would allow longitudinal subdivision and double bottoms to be used in lieu of transverse bulkheads to meet Type II subdivision requirements. Under the current regulations, only transverse bulkheads are sufficient to meet the subdivision requirements. The proposed standard will provide designers with greater flexibility while maintaining the current level of safety against collisions and groundings.

Section 171.077 Damage stability requirements for multihull vessels.

1989 NPRM

Proposed § 171.077 incorporates existing Coast Guard policy defining the extent of damage which a multihull vessel is assumed to incur for the purpose of determining subdivision requirements. It describes the analysis necessary to demonstrate equivalency to Type 11 subdivision. The existing regulations are not directly applicable to multihull vessels. This proposal does not impose any additional costs.

Section 171.080 Damage stability standards for vessels with Type I or Type II subdivision.

1989 NPRM

Proposed 171.080(d)(5) establishes standards for approving a small passenger vessel range of stability in the damaged condition which are similar to international standards. The existing requirement to have 2 inches of positive GM in the equilibrium condition does not ensure that small passenger vessels will survive in this condition. Analysis has shown that launching survival craft would capsize some vessels which meet the current criteria. The proposed criteria are less severe than those which are now being applied for an equilibrium angle of heel of greater than 7 degrees. Existing regulations allow the Commanding Officer of the Marine Safety Center to approve a vessel's range of stability in the damaged condition if the equilibrium angle of heel is greater than 7 degrees. Some Merchant Marine Technical Offices (mmt) previously imposed criteria more severe than those of the proposal when they determined that greater stability than was required by regulation was necessary on a vessel with an equilibrium angle of heel of 7 degrees or less.

An estimated 5% of the vessels subject to proposed § 171.080(d)(5) would have to have additional fixed ballast or bulkheads, beyond those required by existing regulations, to comply with the proposal. The additional bulkheads or ballast would cost approximately \$5000 per vessel.

Section 171.085 Collision Bulkhead

1994 SNPRM

The proposed rules did not address the requirements for collision bulkheads in existing § 171.085. One comment suggested that paragraphs (c), (d), and (j) of § 171.085 are incompatible and confusing. The Coast Guard agrees that numerous problems interpreting this regulation have been experienced. The Coast Guard Marine Technical and Hazardous Materials Division is currently considering changes to clarify this section as part of a regulation project entitled "General Revisions to Stability Regulations" (CGD 89-036) that will update and correct subchapter S in general. An NPRM is expected to be published in the future.

Sections 171.114, 171.119, 171.124, and 171.140 through 171.155.

1989 NPRM

The requirements of existing §§ 171.114, 171.119, 171.124, and 171.140 through 171.155 are contained in Parts 178 and 179 of the proposed Subchapter T.

Section 171.122 Watertight integrity above the margin line in a vessel of 100 gross tons or more

1996 IFR

Based upon the Coast Guard's review of this Part, a correction has been made to proposed § 171.122 regarding coaming heights. In the SNPRM, the Coast Guard proposed to remove § 171.124 because it duplicated requirements in § 179.360. Removal of § 171.124 also removes Table § 71.124. However, § 171.122 references Table 171.124 for coaming height requirements. Therefore, Table 171.124 is redesignated as Table 171.122.