

RECOMMENDATIONS FOR CHANGES TO 46 CFR PART 28 SUBPART E STABILITY

The information and recommendations herein are hereby offered to the Coast Guard by the Commercial Fishing Safety Advisory Committee (CFSAC)

28.500 Applicability.

- (JM) Applicability of subpart somewhat changed since CGAA 2010 and CGMTA 2012 require all FVs of 79' or larger and newly built after 7.1.2013 to be load lined.
- (HH) Also, vessels of as little as 50' LOA are affected because of classification or equivalent requirements in 46 USC 4503.
- (HH) Stability criteria for new vessels of at least 50' and less than 79' should also be subject to Subpart E, with adjustment as noted below in 28.570.

28.501 Substantial alterations.

- (HH) "Substantially altered" is partially defined here and partially in 28.510, which is confusing.
- (HH) The complete definition should only be in 28.510, then referred to, from here.

28.505 Vessel owner's responsibility.

- See comment below in 28.530.

28.510 Definition of stability terms.

- (HH) See recommendation in 28.501 regarding "Substantially altered".

28.515 Submergence test as an alternative to stability calculations.

- (JM) 285.15(e) should have weight per person increased from 165 to 185 pounds to align with Assumed Average Weight Per Person (AAWPP) in 46 CFR 170.090.

28.530 Stability instructions.

- (JM) There should be a signature page somewhere in the stability book for the master AND engineer to sign acknowledging that they have read and understand the stability instructions.

28.535 Inclining test.

- (HH) Title of this section should be "Stability test" because it addresses more than one type of stability test (inclining experiment, deadweight survey).
- (HH) All phrases "inclining test" should be replaced with the proper term "inclining experiment".

28.540 Free surface.

- (HH) This section is not clear enough regarding exclusion of empty tanks.
- (JM) Add a provision for not having to include free surface for tanks unavailable for service, but also including a requirement that these restrictions be clearly identified on Capacity Plans.

28.545 Intact stability when using lifting gear.

- (JM) Inclusion of boom weight in the heeling moments should be clarified.

28.550 Icing.

- (HH) This section omits increased icing criteria in North Atlantic regions defined by IMO. They should be included.
 - (JM) Additional language is needed to address added ice on top of "open" deck gear, specifically crab pots, in addition to the deck below the gear.
-

28.555 Freeing ports.

- (HH) These freeing port criteria are adequate for vessels of L=79' or larger, but vessels with short bulwark lengths are penalized by the criteria because of the minimum area part of the calculation.
- (HH) Freeing port area for vessels of L<79' should instead apply the IMO Voluntary Guidelines for the Design, Construction and Equipment of Small Fishing Vessels 2005 Edition, Regulation 2.14.

28.560 Watertight and weathertight integrity.

28.565 Water on deck.

- (CP) Figure 1 is incorrect. WOD heeling arm goes to zero once the bulwark cap is immersed.

28.570 Intact righting energy.

- (CP) 28.570(c) – Needs clarification on when the 50° range of stability applies, since it overlaps with 28.570(a).
- (HH) Stability criteria for new vessels of at least 50' and less than 79' should be the same, except with 28.570(a) adjusted by IMO Voluntary Guidelines for the Design, Construction and Equipment of Small Fishing Vessels 2005 Edition (Regulation 3.2.1.2).

28.575 Severe wind and roll.

- (HH) These criteria are slightly different than IMO, seemingly in error, and should be changed to correlate with IMO criteria.

28.580 Unintentional flooding.

- (HH) Clarification: Current unintentional flooding regulation applies to new vessels of L=79' or longer built after 09.15.1991.
 - (HH) Clarification: 28.580(i) allows a vessel to obtain and maintain a Load Line Certificate under subchapter E of this chapter in lieu of meeting the requirements of paragraphs (c) through (g) of this section.
 - (HH) Since new vessels L=79' or larger built after 07.01.2013 must be load lined, the unintentional flooding criteria in paragraphs (c) through (g) should only be applicable to vessels built on or after 09.15.1991 and on or before 07.01.2013.
-

OTHER RELATED POLICY ISSUES

Consumable liquids (fuel, water) as ballast

- (HH) USCG MSC current interpretation is too conservative, without tangible basis. Marine Safety Manual (MSM) Vol. 4 does not offer adequate reasoning. Refer to attached HWA letter dated September 11, 2017 for detailed explanation (**Enclosure 1**).

Off center lightship transverse center of gravity (TCG)

- (HH) USCG MSC current interpretation is too conservative, without tangible basis. Numerous uninspected fishing vessels with off-center TCG are successfully countered by opposite side tank loading, without incident.

Marine Safety Center (MSC) Guideline H2-20

- (HH) Refer to attached comments on PDF markup of the document (**Enclosure 2**).
-



**ENCLOSURE 1
(3 PAGES)**

HOCKEMA & WHALEN ASSOCIATES

NAVAL ARCHITECTS ♦ MARINE ENGINEERS ♦ ELECTRICAL ENGINEERS

September 11, 2017
82 FR 26632 and 31545 (LTR2)

Docket Management Facility
U.S. Department of Homeland Security
(Submitted via website: www.regulations.gov)

Subj.: **Evaluation of Existing Coast Guard Regulations, Guidance Documents, Interpretive Documents, and Collections of Information (Docket No. USCG-2017-0480)**
HWA Comments Applicable to Marine Safety Center Policies and Procedures

Ref.: a) 82 FR 26632, Evaluation of Existing Coast Guard Regulations, Guidance Documents, Interpretive Documents, and Collections of Information
b) 82 FR 31545, Extension of Comment Period for 82 FR 26632
c) Marine Safety Manual (MSM), Volume IV

Dear Sir or Madam,

References (a) and (b) requested comments on Coast Guard regulations, guidance documents, and interpretative documents that we believe should be repealed, replaced, or modified. In addition, the Coast Guard requested comments on USCG approved collections of information, regardless of whether the collection is associated with a regulation. This action is in response to Executive Orders 13771, Reducing Regulation and Controlling Regulatory Costs; 13777, Enforcing the Regulatory Reform Agenda; and 13783, Promoting Energy Independence and Economic Growth. Reference (a) requested comments on regulations and documents that:

- Eliminate jobs, or inhibit job creation;
- Are outdated, unnecessary, or ineffective;
- Impose costs that exceed benefits;
- Create a serious inconsistency or otherwise interfere with regulatory reform initiatives and policies;
- Are inconsistent with the requirements of section 515 of the Treasury and General Government Appropriations Act, 2001 (44 U.S.C. 3516 note), or the guidance issued pursuant to that provision, in particular those regulations that rely in whole or in part on data, information, or methods that are not publicly available or that are insufficiently transparent to meet the standard of reproducibility; or
- Derive from or implement Executive Orders or other Presidential directives that have been subsequently rescinded or substantially modified.

The following comments concentrate on issues related to Coast Guard regulations and policies, and their dissemination and explanation to the public. We believe these issues fall in the categories noted above.

Reasoning for and Recording of Coast Guard Regulations and Policies

The Coast Guard develops and enforces numerous regulations and policies within their regulatory realm. In many cases, adequate reasoning is provided to explain why the regulations or policies exist. For regulations, this usually occurs in the Notice of Proposed Rulemaking (NPRM) and/or the Final Rule published in the Federal Register (FR), after public comments are solicited and received for a rulemaking. Since the regulatory development process requires that the Coast Guard replies to all comments received for a rulemaking, there is usually an adequate information trail documenting why the Coast Guard ruled the way they did.

On the other hand, for policy development, public comment is not necessarily required so in many cases the reasoning for the policy is not adequately explained to the public before the policy is adopted. Because of this, many policies are created and enforced by the Coast Guard without adequate reasoning being provided to the public. We are sometimes bound by policy we don't agree with but, when we ask why the policy exists, the Marine Safety Center's (MSC) response is simply that since the policy is established we must comply with it. This happens even when we have good reason for the policy not to apply in specific cases. When we ask for the specific reasoning behind the policy, sometimes no one at the MSC knows for sure — it's just policy so it should be enforced. This is counterproductive when we know a policy is not necessary, especially when the policy requires more consulting time on our part and more physical modifications to vessels than we think is necessary, both costing the vessel owner more money and time for compliance.

We realize that we learn from required compliance with policy that we might not have known about or misinterpreted previously, and we welcome those learning experiences. However, when we are faced with policy we don't think adds safety or value, or even decreases safety or value, we feel that the Coast Guard should be able to back up the policy with a reasonable and detailed explanation for why the policy is necessary.

One example of policy that does not provide supporting information and has not been explained to us adequately, is in MSN IV 6.E.19.c. This policy indicates that "Required ballast must be either fixed or seawater" so consumable liquids such as fuel oil are not allowed to be used as ballast. Around 1990 when U.S. flagged factory trawlers were obtaining Load Line certifications, Seattle area naval architects were told by the Coast Guard Marine Safety Center that we could not use fuel oil as ballast because vessel operators may either be tempted to or accidentally consume fuel oil at the end of a fishing trip that was intended for ballast, not for consumption. The reasoning was that burning that fuel oil might lead to lesser stability characteristics than calculated in the stability guidance for that vessel. We have found no evidence that vessel operators consume fuel oil or potable water from tanks where we instruct them not to do so.

Today we are faced with even more restrictions on ballasting load lined vessels. One example is our specific instructions regarding fuel oil burn-off sequence to maintain optimum (usually minimum) trim and, in the process, to ensure adequate stability throughout the normal operating range. The Marine Safety Center now considers this to be using fuel oil as ballast, because we are controlling the vessel trim with the fuel oil. Where did this interpretation come from? No one can tell us but it is policy, so it is not allowed.

We think both of the above limitations on fuel oil, or potable water, used as ballast are overly restrictive and can even lead to less safe vessels. Furthermore, we don't like seawater ballast because of obvious tank maintenance expenses and environmental factors concerning invasive species transfer. Our staff's experience with stability of commercial vessels spans nearly four decades and we are not aware of a single stability incident caused by using fuel oil or potable water as temporary ballast. In fact, for our uninspected vessels we have prescribed limitations on fuel oil and potable water, which would be considered ballast by these narrowly define policies, several times. Specific tank consumption sequence instructions are a staple of our stability instructions for uninspected vessels. Those unlicensed operators welcome the specific tank loading instructions and they comply with our instructions without incident.

If you have any questions or if you need further information, we encourage you to contact our office.

Sincerely,

HOCKEMA & WHALEN ASSOCIATES, INC.

A handwritten signature in black ink, appearing to read 'HOCKEMA', written over a horizontal line.

Hal Hockema, P.E.
President & Managing Principle Engineer

The following Hockema & Whalen Associates staff contributed to this letter's development:

John Myers, P.E.
Vice President & Principle Naval Architect

Michael Whalen, P.E.
Senior Principal Naval Architect

Craig Pomeroy, P.E.
Principal Naval Architect

Paul Monical, P.E.
Associate Naval Architect

Stephen Gatz, P.E.
Senior Naval Architect

MSC Guidelines for Commercial Fishing Vessel Stability

Procedure Number: H2-20

Revision Date: 06/17/2013

Reference f. is obsolete and should be deleted.



K. B. FERRIE, LCDR, Chief, Hull Division

Purpose:

To provide guidance on the review of commercial fishing vessel (CFV) stability.

References:

- a. 46 CFR Subchapter C – Uninspected Vessels
 - b. 46 CFR Subchapter E – Load Lines
 - c. Marine Safety Manual (MSM) Chapter IV Section 6
 - d. Guidance for the Alternate Compliance and Safety Agreement (ACSA) Program, Revision 7, December 2012
 - e. ABS Rules for Building and Classing Steel Vessels Under 90 meters (295 feet) in length 2011, Part 5 Specialized Vessels and Services, Chapter 14 Fishing Vessels
 - f. Navigation and Vessel Inspection Circular (NVIC) 5-86 “Voluntary Standards for U.S. Uninspected Commercial Fishing Vessels”
 - g. MTN 04-03, Change 1 “Authorized Class Societies Technical Support and Oversight”
 - h. International Code on Intact Stability, 2008, Chapter 2.1 Fishing Vessels
 - i. IMO International Conference on Safety of Fishing Vessels 1977 and 1993 amendments
 - j. MTN 04-95 “Lightship Change Determination”
 - k. MSC Plan Review Guidelines H2-01, “Submission of Stability Test Procedures”
 - l. MSC Plan Review Guidelines GEN-02, “Submission of Stability Test (Deadweight Survey or Inclining Experiment) Results”
 - m. MSC Plan Review Guidelines H2-06, “Trim and Stability Books”
 - n. NVIC 3-89 “Guidelines for the Presentation of Stability Information for Operating Personnel”
-

Contact Information:

If you have any questions or comments concerning this document, please contact the Marine Safety Center (MSC) by email or phone. Please refer to the Procedure Number H2-20.

Email: MSC@uscg.mil

Phone: 202-475-3401

Website: <http://homeport.uscg.mil/msc>

Responsibilities:

Using applicable portions of references (a) through (n), the submitter shall provide sufficient documentation and plans to indicate compliance with the applicable requirements as identified under “submitted Items” below. The

MSC Guidelines for Commercial Fishing Vessel Stability

Procedure Number: H2-20

Revision Date: 06/17/2013

submission shall be made either electronically to the above email address or, if paper, in triplicate to the MSC's address found on the above website. To facilitate plan review, all plans and information specified in these guidelines should be submitted as one complete package through a single point of contact for the project.

General:

The MSC reviews CFV stability for load line assignment at the request of an

Several new vessels under 79 feet have been successfully designed and operated in rough sea environments when complying with 46 CFR Subpart E, with 46 CFR 28.570(a) adjusted by IMO Voluntary Guidelines for the Design, Construction and Equipment of Small Fishing Vessels 2005 Edition (Regulation 3-3.2.1.2). 28.570(b) and (c) has been applied for these vessels without adjustment.

Applicable Regulations:

References (a) through (d) provide specific guidance on the applicable stability criteria and definitions. The following guidance summarizes the applicability found in these references:

- ❑ **Vessels under 79 feet Registered Length:** There are currently no regulations governing the stability for a vessel of this size.
- ❑ **Vessels over 79 feet Registered Length, not required to be load lined:**
 - on or and on or before July 1, 2013
 - a) *Vessels Built after September 15, 1991 and those vessels determined to have undergone a Major Conversion or been substantially altered on or after September 15, 1991:* These vessels will be subject to all of 46 CFR Subchapter C Subpart E and good marine practice. 46 CFR ~~5.80~~ does not apply to those that have undergone a Major Conversion or been substantially altered. 28.580
 - A vessel obtaining and maintaining a Load Line Certificate as per 46 CFR 28.580 (i) in lieu of meeting damage stability requirements will be evaluated using 46 CFR Subchapter C Subpart E and applicable classification rules.
 - b) *Existing vessels build before September 15, 1991 (i.e. grandfathered vessels):* There are no regulations governing stability for these vessels. The MSC will provide technical comments and/or concerns to the OCMI upon their request. MSC will conduct stability reviews using 46 CFR Subchapter C, Subpart E, as completely as reasonable (excluding 46 CFR 28.580) and good marine practice.
 - c) *Vessels enrolled in the ACSA program:* The ACSA program requires vessels to meet 46 CFR 28.500. MSC will continue provide technical

MSC Guidelines for Commercial Fishing Vessel Stability

Reference to NVIC 5-86 is out of date and should be replaced by 46 CFR Part 28 Subpart E. The basis for MSM Vol. IV Section 6.E.19 was formed before Part 28 was initially issued so 6.E.19 should be completely rewritten. There is also no valid reason to use different stability criteria for vessels catching fish and those processing fish.

Revision Date: 06/17/2013

g to the OCMI upon their request, as for ACSA fishing vessel stability. ect to the alternate safety compliance and alternate load line compliance programs once established.

□ Vessels over 79 feet Registered Length, required to be load lined:

46 CFR 42.09-1, Assignment of Load lines: "The assignment of load line is conditioned upon the structural efficiency and satisfactory stability of the vessel." The stability review will be conducted in support of load lines using the below stability criteria and good marine practice.

- a) *Fishing processing and tender vessels required to be load line:* The MSM, Volume IV, Section 6.E.19 provides two alternatives for stability criteria for these vessels:

- (1) 46 CFR Subchapter S; and
(2) NVIC 5-86.

The stability criteria (i.e. 46 CFR Subchapter S or NVIC 5-86) selected by the submitter, applicable classification requirements, and good marine practice will be used for stability reviews conducted in support of load lines.

The MSC may also conduct stability analysis using 46 CFR Subchapter C when the vessel is engaged in catching, taking or harvesting of fish. The results of this stability analysis will be provided to the submitter for informational purposes only and will not be used in support of load line assignment.

- b) *Fishing vessels 79 feet or greater in length that are built after July 1, 2013 **:* The stability review will be conducted in support of load line using 46 CFR Subchapter C, Subpart E, the applicable classification society rules, and good marine practice.

***The Coast Guard is implementing those requirements of a 2010 statute that pertain to uninspected commercial fishing industry vessels and that took effect upon enactment of the statute but that, to be implemented, require amendments to Coast Guard regulations affecting those vessels. The applicability of the regulations is being changed, and new requirements are being added to safety training, equipment, vessel examinations, vessel safety standards, the documentation of maintenance, and the termination of unsafe operations. This*

MSC Guidelines for Commercial Fishing Vessel Stability

Procedure Number: H2-20

Revision Date: 06/17/2013

rulemaking promotes the Coast Guard strategic goal of maritime safety. [see Semiannual Regulatory Agenda- Fall 2012; Docket ID DHS-2013-0003-0001].

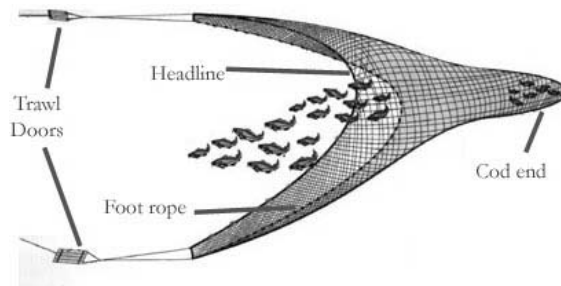
NOTE: The requirement for classification can come from the US Code or the requirements specified by the ACS. DNV has confirmed that they require their load lined vessels to be classed. The MSC conducts oversight on all load line stability matters completed by ACS. All stability requirements outlined in the ACS rules will also be applied.

Definitions

- **Alternate Compliance and Safety Agreement (ACSA) Program:** Voluntary program by which fish processing vessels, that are not accepted for classification and /or loadline by an ACS, can demonstrate an equivalent level of safety per the intent of 46 CFR 28.720. This program is currently managed by Sector Puget Sound.

Note: This program is currently only applicable to those fish processing vessels under the jurisdiction of Sector Anchorage and Sector Puget Sound.

- **Alternate Load Line Compliance Program (ALLCP):** In accordance with 46 United States Code (USC) 5103(c), an alternative safety compliance program to be developed in cooperation with industry and may be developed for specific regions.
- **Alternate Safety Compliance Program (ASCP):** In accordance with 46 USC 4503 (2) and (3), an alternative safety compliance program to be developed in cooperation with industry and may be developed for specific regions.
- **Cod End:** The trailing end of the net where fish are finally "caught". The size of mesh in the cod end is a determinant of the size of fish which the net catches. Consequently, regulation of mesh size is a common way of managing mortality of juvenile fishes in trawl nets.



- **Fish:** Finfish, mollusks, crustaceans, and all other forms of marine animal and plant life, except marine mammals and birds.
- **Fish Bin:** Large space, usually located adjacent to the factory on fish processing vessels, where the fish is stored to await processing.

MSC Guidelines for Commercial Fishing Vessel Stability

Procedure Number: H2-20

Revision Date: 06/17/2013

- ❑ Fish Oil: Fish oil is a bi-product of the cleaning and freezing of the catch produced during fish processing operations. Many vessels are undergoing changes to enable them to carry fish oil.
 - ❑ Fish Processing Vessel: A vessel that commercially prepares fish or fish products other than by gutting, decapitating, gilling, skinning, shucking, icing, freezing or brine chilling.
 - ❑ Fish Tender Vessel: A vessel that commercially supplies, stores, refrigerates, or transports fish, fish products, or materials directly related to fishing or the preparation of fish to or from a fishing, fish processing or fish tender vessel or a fish processing facility.
 - ❑ Fishing Vessel: A vessel that commercially engages in the catching, taking or harvesting of fish or an activity that can reasonably be expected to result in the catching, taking or harvesting of fish.
-

Submittal Items:

It is common for some of these items to not exist for existing vessels, especially fishing and fish tender vessels.

Provide the following plans and calculations:

- ❑ General Arrangements including deck plans, hold plans (indicating compartmentation and watertight doors), inboard and outboard profiles (indicating potential downflooding points such as vents or windows)
 - ❑ Lines or offsets
 - ❑ Computer hull model (optional, however it will expedite stability reviews)
 - ❑ Tank capacity tables/plan with free surface data
 - ❑ Draft mark locations, longitudinal and vertical reference points
 - ❑ Copy of the signed stability test notes (signed by ACS surveyor or USCG inspector)
 - ❑ Stability test/lightship results
 - ❑ Intact stability calculations to include:
 - a) List of downflooding points and hull openings
 - b) Crane information including capacity, location and supporting calculations (if applicable)
 - c) Ice load calculations (if applicable)
 - d) Water on deck calculations (if applicable)
 - e) Fishing gear loads (as needed)
 - f) Other calculations as needed to support assumptions and loads used in calculations
 - ❑ Subdivision and damage stability calculations (if applicable)
 - ❑ Trim and Stability Booklet (if applicable)
 - ❑ Load Line Survey Report (LL-11D) (if applicable)
 - ❑ ACSA Stability Addendum (if applicable)
 - ❑ Additional plans and calculations as needed (i.e. structural plans and calculations to demonstrate compliance with buoyant superstructure requirements)
-

MSC Guidelines for Commercial Fishing Vessel Stability

Procedure Number: H2-20

Revision Date: 06/17/2013

- List of changes made to the vessel that will impact stability

Stability Tests

- When trying to determine if a stability test is required, the guidance of reference (i) should be followed.
 - a) As a condition of enrollment in ACSA, CFVs are required to undergo a stability test every five years. The final decision pertaining to the type of test that is required will be at the discretion of the cognizant OCMI.
 - b) There is currently no direct guidance provided on how and when stability tests are required for fishing vessels that are classed and / or load lined by an ACS. Therefore, until further guidance is provided, reference ~~(i)~~ should be followed. (i)
- When preparing CFV stability test procedures and results:
 - a) Stability test procedures should be prepared in accordance with reference ~~(j)~~, and should be submitted to MSC at least two weeks prior to the test date for approval, when applicable. (k)
 - b) Stability test results should be prepared in accordance with reference ~~(k)~~. (l)
 - c) Due to the arrangement of larger fishing vessels it may be difficult to minimize trim to the limits per reference (k). MSC may make some allowance for this by allowing additional slack tanks beyond what is permitted by reference (j) if sufficient justification is provided in the stability test procedure. (l)
 - d) The vessel should be properly prepared at the time of the stability test, the weights to add and subtract should not exceed 2% of vessel lightship. In order for items to be excluded from the 2% weights to add or subtract at the time of the stability test they must generally be fixed (i.e. welded or bolted to a dedicated foundation) and the exact weight and center of gravity must be known through measurement or manufactures specification. In the case where there are a large number of identical items a representative sample of the items may be weighted and excluded as accepted by the MSC on a case by case basis. Structural members, angles, and brackets are not permitted to be excluded from the weights to add or subtract.
 - e) Fishing equipment, including netting and gear, are not to be considered as part of lightship and should be accounted for in the weights to add, remove, or relocate per reference (k), if they are onboard at the time of the test. Every attempt should be made to remove as much of the fishing equipment as possible. In the event of perceived uncertainty of the weight of the fishing equipment, netting, gear, etc., the attending marine

MSC Guidelines for Commercial Fishing Vessel Stability

Procedure Number: H2-20

Revision Date: 06/17/2013

inspector or surveyor may require such items to be removed from the vessel prior to conducting the stability test.

- f) The transverse center of gravity (TCG) of all items should be properly accounted for when establishing vessel lightship characteristics if the resultant lightship list is more than 0.5 degrees.
 - g) For load lined vessels the information should be provided in accordance with 46 CFR 42.09-10(c).
-

Stability Calculations

Commercial fishing vessel stability calculations should be developed with specific focus on the unique characteristics of fishing operations. In the preparation of stability calculations certain assumptions and decisions regarding loads, free surface effects, and other items are made. The precision of these assumptions directly impacts the outcome of the stability analysis.

The following should be considered in the preparation of stability calculations to ensure that the full range of possibilities has been accounted for and result in accurate and / or conservative results:

- ❑ **Hull Model:** If a hull model is provided, sufficient information should be presented to enable verification of the model. In many cases fishing vessels have undergone extensive changes; sponsoning, addition of structure to the deck house, etc. Due to the age and extent of changes to CFVs an up-to-date accurate lines plan and list of hull openings is not always available. However, every effort should be made to ensure that the model used in the analysis of stability is as complete and accurate as possible.
 - ❑ **Effective Deckhouse Structure:** Buoyant volume of the deckhouse for intact stability should be properly considered in accordance with section 6.B.1 of reference (c). Guidance on buoyant superstructure for unintentional flooding is provided in 46 CFR 28.580 (h).
 - ❑ **Deck Loads:** When applying reference (e) to ensure proper strength of a deck that will be loaded with large temporary deck loads such as catch and / or cod ends, the “h” applied is not to be less than the appropriate vessel length equation, and should be taken as the anticipated pressure “p” divided by 45 lbf/ft³. We recommend that the identified head be multiplied by a factor of 1.1 to account for any shifting / uneven loading, green loads and / or other accelerations of the vessel in the seaway.
 - ❑ **Operational Loads:** Many CFVs have nets and other fishing gear that is used based on the season and fishery. The stability analysis should identify the range of these loads and / or any assumptions made relative to these items.
-

MSC Guidelines for Commercial Fishing Vessel Stability

Procedure Number: H2-20

Revision Date: 06/17/2013

- Loading Conditions: As there are large loads that are moved around a fishing vessel during fishing and processing operations, it is important to identify the full range and combination of loads that a vessel will experience. If the vessel has a lightship list of more than 0.5 degrees then all of the loading conditions must properly account for the vessel's TCG. Fuel and other consumable tanks may not be used to correct vessel list per section 6.E.19.C of reference (c). Ballast tanks may be used to adjust vessel list. Often times the most critical loading condition for the vessel will result when the vessel is low on fuel and low on catch, or as the vessel is beginning to fish but has little or no catch in the hold. Minimally, the following loading conditions should be addressed:
 - a) Departure condition from port with full fuel, water, stores, ice, fishing gear, etc.;
 - b) Arrival at the fishing grounds with reduced fuel, water, and stores and no catch (the amount of fuel, water and stores should be based on the distance to the fishing area);
 - c) At the fishing grounds with reduced fuel, water and stores and 50% catch;
 - d) Departure from the fishing grounds with reduced fuel, water, and stores and full catch;
 - e) Arrival at home port with 10 percent fuel, water and stores, and full catch (be sure to account for any weights to be lifted or suspended and their effects on stability in a turn);
 - f) Arrival at home port with 10 percent fuel, water, and stores and 20 percent of full catch.(40 percent of full catch will be considered if catch records are provided demonstrating that the vessel always returns to port with at least 40 percent catch.)
- Cargo: For a vessel with large cargo holds a full range of hold loading options should be considered. Also for vessels that produce fish oil, please note that fish oil is considered a flammable and combustible material so a fishing vessel cannot carry more than 20% of their cargo deadweight in fish oil per 46 CFR Subchapter D (30.25-1, Table 1) and MSM Volume II, Section F.2.6.
- Vessel List: For a vessel with a list of more than 0.5 degrees in the lightship condition, the actual vessel TCG should be properly accounted for in all conditions of loading.
- Ice Loads: For vessels operating in applicable regions, ice loads should be calculated in accordance with 46 CFR 28.550. Ice loads should be considered in all conditions of loading.
- Free Surface: The virtual rise in the vessel's vertical center of gravity (VCG), due to liquids in tanks, should be accounted for in accordance with 46 CFR

MSC Guidelines for Commercial Fishing Vessel Stability

Procedure Number: H2-20

Revision Date: 06/17/2013

28.540,. The free surface of all non-consumables, including fish bins and cargo holds, should be properly addressed per 46 CFR 28.540(a)(2). If ballast tanks are filled while the vessel is underway, the maximum free surface of the tanks should be considered.

- ❑ **Watertight and Weathertight Integrity and Downflooding:** These items should be properly addressed in accordance with 46 CFR 28.560 and 28.510, or 46 CFR 42.09-25, 42.13-15(l) and 42.15. There are several variations on the definition of downflooding and downflooding angle across the various references. Typically, any point that cannot be closed weathertight is to be considered as a downflooding point for stability calculations. However, for fishing vessels there are often large openings in the hull that are left open for long periods of time while fishing operations are underway. All openings that are typically open during fishing operations may need to be considered as downflooding points. All openings into the fish holds and processing spaces that are normally open while fishing should be checked to ensure that unintentional flooding could not occur at an angle of heel of 20 degrees. Final determination as to which points should be considered for downflooding is at the determination of the submitting engineer based upon the use of good engineering judgment and marine practice. Things to be considered include the ability of the opening to be rapidly closed weathertight and / or watertight, whether the related hatches are continually manned, etc.
- ❑ **Water on Deck:** When applicable water on deck should be considered as described in 46 CFR 28.565.
- ❑ **Extents of Damage:** When applicable, the extent of damage should be assumed as described in 46 CFR 28.580(d), or 46 CFR 42.20-11, and 42.20-12. Note that the extents of damage requirements are different than those provided in 46 CFR Subchapter S.
- ❑ **Permeabilities:** The permeability of compartments should be properly accounted for when damage stability calculations are performed per 46 CFR 28.580(g). For intact stability calculations special attention should be paid to the permeabilities of fish holds as this will vary based on the type of catch and how the catch is stored. For example, on a fishing vessel the fish are often stored in holds that are flooded with water, while on fish processing vessels the catch is often boxed and frozen.
- ❑ **Lifting Weights:** Many fishing vessels have cranes or other lifting gear installed. These loads should be accounted for in accordance with 46 CFR 28.545. Detailed information on the type, size, location and operating limits of all lifting equipment should be provided along with any calculations used when evaluating vessel stability.

MSC Guidelines for Commercial Fishing Vessel Stability

Procedure Number: H2-20

Revision Date: 06/17/2013

- ❑ Freeboard: It is not acceptable for a CFV to operate with negative freeboard. Specifically the vessel's freeboard deck should not be submerged. If a vessel wishes to re-designate a higher deck as a new freeboard deck, then the structure below the new freeboard deck must be shown to comply with the hull structural requirements, as well as meet the applicable watertight and watertight closure requirements. Additionally, vessels required to be load lined will be evaluated against the requirements of reference (b).
 - ❑ Trawling loads: For vessels that trawl over the side, the applicable sections of references (a) (46 CFR 28.545) and part F of reference (f) should be applied. For vessels that conduct stern trawling operations the criteria of 46 CFR 173.095 should be applied. The definition of downflooding points and angles required per 173.095 (e) may be reconsidered for vessels on a case by case basis.
 - ❑ Ballast: If the vessel has a heel in the lightship condition we encourage the owner / operator to install permanent ballast to correct the list. Alternatively ballast tanks may be used to adjust / correct for the vessels list. Fuel or other consumable tanks may not be used to correct vessel list per MSM IV, 6.E.19.
-

Stability Instructions

There are many details that can be included in CFV stability instructions to ensure that the master has sufficient information to be able to rapidly and precisely estimate that loads and locations of the various items on the vessel. The following items should be considered:

- ❑ CFV stability instructions should be prepared in accordance with reference (l) based on the specific type of vessel.
- ❑ If a vessel has a significant lightship list the instructions should include sufficient information to ensure that the master understands the magnitude of asymmetric ballast that is necessary to adjust the list and ensure the vessel is operated at an even heel.
- ❑ If a vessel's cargo must be loaded in a specific manner in order for the vessel to operate within a safe stability operating range this should be clearly defined.
- ❑ If the stability instructions contain more than one method for verifying that the vessel is operating in a safe stability condition, it should be clear when the various methods apply.
- ❑ Asymmetric Consumable Tank Loading: Consumable tanks may not be asymmetrically loaded to offset vessel list or operational deck loads (including pot loads) when simplified stability instructions are being developed. Per reference (m) only a single pair of consumable tanks is to be partially filled at a time for simplified stability instructions. If the owner wishes to have asymmetrically loaded tanks then a detailed trim and stability

MSC Guidelines for Commercial Fishing Vessel Stability

Procedure Number: H2-20

Revision Date: 06/17/2013

booklet that enables the actual vessel loading condition to be evaluated against the appropriate criteria should be used.

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 the Marine Safety Center (MSC), the unit responsible for implementing this guidance.