



Fishing Vessel Leif; July 6, 2005.
Official U.S. Coast Guard photo by
Petty Officer Chris Leibrant

Modifications, Alterations, and Weight Creep

What are Modifications, Alterations, and Weight Creep?

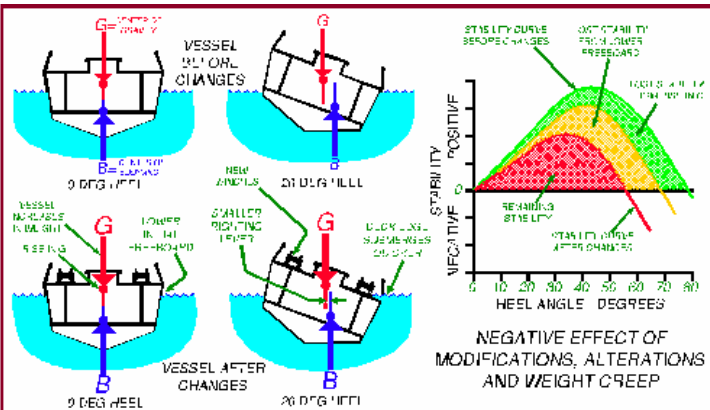
Modifications and alterations are the changes to your vessel during its life due to changing fisheries, fishing methods, and area of operations. With the introduction of new, better techniques and technology come the upgrade, replacement and installation of equipment, or the changing of superstructure, holds, or other spaces and deck gear.

These changes or additions will also cause "weight creep." This occurs over time on most fishing vessels when adding equipment and supplies. Adding a microwave here, later a new sonar and then upgrading the galley may not appear significant, but minor additions over time will change the characteristics of your vessel.

These changes, both large and small, can have a significant impact on your vessel's overall stability and must be recognized and dealt with to ensure the safety of your vessel and crew.

How do Modifications, Alterations, and Weight Creep affect your stability?

Modifications and alterations can negatively impact your vessel's stability in many ways. The most common, such as adding new winches or fishing gear, are an increase in vessel's overall weight. Moreover, these changes tend to be added higher up on the vessel. As the alterations are made, the overall center of gravity (COG) of the vessel rises and the freeboard may be reduced.



These two factors affect the stability of a vessel. The center of gravity (CG) is a single point mathematically derived by summing all the factors (vessel's lightship, tankage, cargo and ship's stores) that influence the overall weight of the vessel. If the CG is high, this is an indication that the weight of the vessel is top heavy. Freeboard is the vertical distance from the waterline to the lowest watertight deck. If the freeboard is reduced, it means the vessel is sitting low in the water. Simply put, the higher the center of gravity and the lower the amount of freeboard makes a vessel more susceptible to unstable situations.

Actions on Modifications, Alterations, and Weight Creep?

Consult with a naval architect or marine surveyor. The vessel's "feel" can not be used to safely gauge how the changes have impacted your vessel's stability. Only a detailed stability analysis can determine the overall status of your vessel. Secondly, establish a Modification and Alteration Log to track changes made over time. There are three ways to log changes.

Manual Logging Program - This is the most basic logging method requiring only a logging form and calculations. It is also the most labor-intensive of the methods available.

Computer Spreadsheet Logging Program - This uses a personal computer (PC) based spreadsheet program to record the changes and check to see if additional stability reviews should be conducted by a qualified individual. It is less labor intensive for the user and minimizes the potential of errors. Although this method does require access to a PC, it does not need to be located onboard the vessel. A sample spreadsheet and a sample log sheet for manual use can be obtained by visiting:

<http://www.Fishsafe.info>

Naval Architect Based Logging Program - This is a form with information that is forwarded to a naval architect to analyze and determine how various changes have impacted your vessel's stability. This method will provide the best degree of accuracy and safety, but at the highest dollar cost.

Currently, 46 CFR part 28, subpart E requires vessels which are 79 feet (24 meters) or more in length to meet certain stability standards. More specifically, a vessel that undergoes a *major conversion* or is *substantially altered*, is required to have its stability evaluated.. They include:

- (1) Alterations that result in a change in the vessel's light-weight vertical center of gravity of more than 2 inches (51 mm), a change in the vessel's lightweight displacement of more than 3%, or an increase of more than 5% in the vessel's projected lateral area, as determined by tests or calculations;
- (2) Alterations which change the vessel's underwater shape;
- (3) Alterations which change a vessel's angle of downflooding; and
- (4) Alterations which change a vessel's buoyant volume.

If applicable, stability instructions developed by a qualified individual must be provided for your vessel. This will ensure that you have information on loading conditions and operating restrictions for the safe operation of your vessel. While stability regulations and requirements are currently only applicable to vessels of 79 feet or more in length, having a survey and obtaining stability instructions on smaller vessels would enhance the safety of the vessel and provide masters a better understanding of the limitations of its operation.

