

**EFFECT OF ICING**

Icing is another factor which can cause a rise in the center of gravity, as well as an increase in vessel displacement. Also, because ice build-up may not be symmetrical about the vessel, it may tend to heel the vessel. Figure 9 shows the effect of an accumulation of 20 tons of ice (a 4 inch buildup) on the sample vessel. Note the severe reduction in righting energy as well as the

4-degree list that results from this condition (the curve begins at 4 degrees, not at 0). In the example shown, icing does not cause as substantial a reduction in stability as some of the other factors. In actuality, its effect can vary from being annoying to being catastrophic.

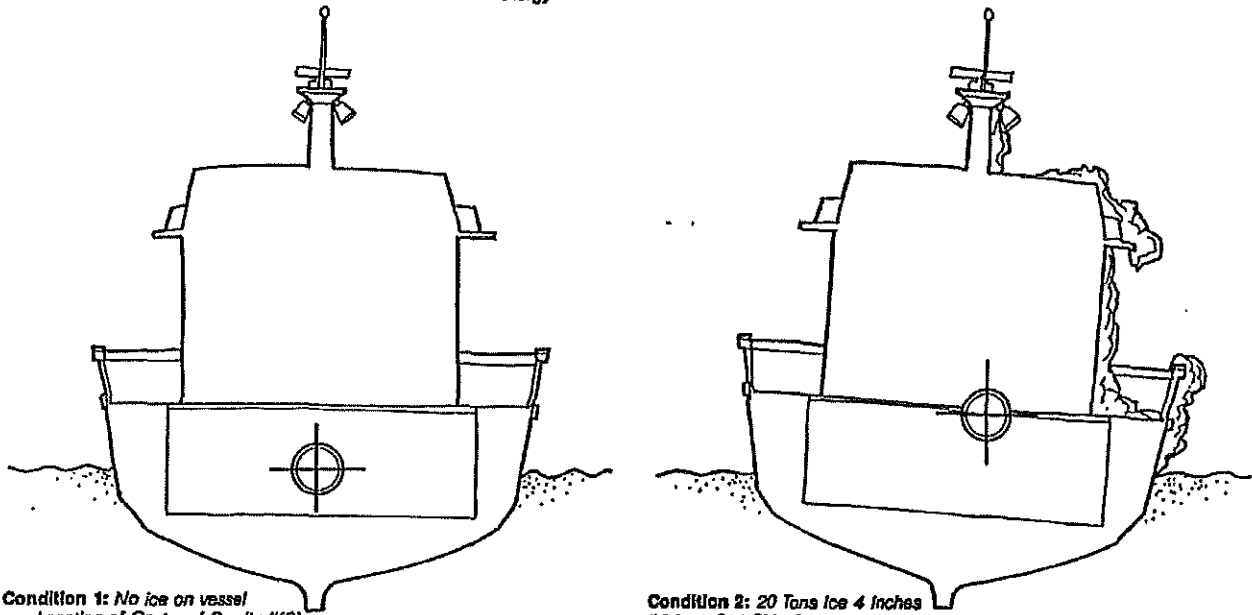
If the vessel is to be operated in an area where icing is likely to occur, the operator should ask the

naval architect to conduct a stability analysis under conditions of icing, then limit the catch in accordance with the recommendations.

Operators should also be aware of the environmental conditions that increase the probability of icing and should take precautions to prevent or reduce ice buildup. As a general rule, any time the air temperature drops below 28° F (-2° C), icing can occur. Increased

chances for icing go with lower temperatures, higher wind speeds, and more sea spray over the upper decks and deck houses. Fishing vessel operators are referred to NVIC 5-86 where graphs that can be used to assess the combined effects of these factors can be found. Possible actions operators can take to reduce ice buildup are a change in speed or heading and physical removal of the ice.

Figure 9. Effect of icing on Righting Energy



Condition 1: No ice on vessel  
 + = Location of Center of Gravity (KG)

Condition 2: 20 Tons Ice 4 Inches thick on Port Side Only

