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UNITED STATES COAST GUARD COMMERCIAL FISHING VESSEL SAFETY PROGRAM

January, 2008

Issue 25E

The Dangers of Ice Accumulation

Ice accumulation is a hazard that threatens vessels of all types, sizes, and trades. Unfortunately, many mariners and fishermen do not recognize ice accumulation as an immediate threat. Ice presents a hazard because it can build up quickly in the right conditions and can lead to a life-threatening situation.

First we should start with what exactly is Ice Accumulation? **It is the build up of ice, created by ocean spray freezing on all surfaces of a vessel.**

So why is Ice Accumulation so dangerous? It is not the ice itself that is dangerous but the weight of the ice that is the hazard. The accumulation of ice adds excess weight to the vessel, compromising the vessel's stability. In technical terms the ice raises the center of mass of a vessel which decreases the righting energy. The righting energy is what returns a heeled vessel to the upright position. Ice Accumulation results in slower than normal vessel response when rolling. This can compound itself quickly and result in a vessel that does not come back from a roll and capsizes.

There are <u>three environmental conditions</u> that are needed for Icing to occur:

Wind Speed – A high wind speed, usually above 18kts is required. Although Ice Accumulation can occur at lower speeds in proper conditions.

Low Air Temperature – The air temperature needs to be below freezing, but below 29º F is worst.

Low Water Temperature – Water temperature below 45º F will result in ice formation if the other conditions are met.

<u>Two additional factors</u> that also affect sea spray icing:

Wind Direction – Ice builds up more quickly on the windward side of the vessel.

Swell and Wave Characteristics – These include the direction relative to the vessel, and height and frequency of the swells or waves.

Vessel relative heading also affects the buildup of ice. As a general rule of thumb, a vessel heading at a higher speed into the wind and the waves will encounter the fastest Ice Accumulation.

Speed – A vessel traveling faster will create more spray which will led to more Ice Accumulation.
Length – While Ice Accumulation effects vessels of all sizes, vessels less than 100 feet are the most vulnerable.
Freeboard – Vessels with a low freeboard will face more severe Ice Accumulation compared to vessels with a high freeboard.
Heading – The vessel's heading greatly effects the severity of Ice Accumulation. Heading into the wind creates the most extreme icing conditions.
Cold Soaking – Cold Soaking is when a vessel has been in very cold water for a prolonged period of time, more than 3 weeks. This may cause the vessel's temperature to actually be lower than the temperature of the water it is in and can cause icing when it would not normally occur or can increase the severity of the icing.

If you encounter severe Ice Accumulation, you should head to port immediately, if possible. If your vessel is not able to make it to port, head for the lee of an island, if available. The island will block some of the wind and waves. In the lee of an island, maneuver your vessel so that you take the wind and waves on the stern to reduce the spray created by the vessel. If you are unable to find shelter, maneuver your vessel so that you minimize the spray created.

Unfortunately, the one truly effective method to get ice off of your vessel is manual labor. Baseball bats, sledgehammers, and shovels are the most effective tools for this job. While this will be miserable work, it is necessary. When removing ice, "Do it Early and Often." Attack Ice Accumulations early and keep on top of it to keep your vessel safe and afloat.

Additional safety-related information for fishing vessels can be viewed at: **www.FishSafe.info**