AMSEA
Alaska Marine Safety Education Association

What Is Cold Water? A Question Revisited

by Richard Hiscock

An article entitled "What is Cold Water? The Surprising Answer" (***Marine Safety Update***, December 1997) examined the issue of what water temperature should be considered "cold." It not surprisingly concludes that waters below 70°F should be considered "cold." Yet, the US Coast Guard has established 59°F (10°C) as its definition of cold water. We need to examine how and why there is such a disparity between these two conclusions.

In 1983 the Coast Guard proposed requiring immersion suits on cargo vessels operating on "cold waters" and exempting vessels operating on "warm waters" – defined as 60°F – and vessels carrying covered lifeboats.

After the sinking of the *Marine Electric* in 1983 Congress, reacting to the exemption for vessels with covered lifeboats, required by statute "immersion suits on vessels . . . that operate in the Atlantic Ocean north of 35 degrees North latitude or south of 32 degrees South latitude and in all other waters north of 35 degrees North latitude or south of 35 degrees latitude." Further, the Coast Guard was not allowed to exempt vessels that carried covered lifeboats. The Coast Guard was also required to submit a report to Congress on warm water exemption and the latitude at which it applied. It is from this report that the "59°F rule" defining cold water evolved.

The Coast Guard report relied primarily on a review of past casualties more than the available science, and concluded that, " . . . 60°F water is 'safe' for an unprotected person for just under 2 hours. The 50% rate of survival is estimated to be at least 4.5 hours. Therefore, water at 60°F should provide the unprotected survivor in the water with enough time to make it to a lifeboat or liferaft floating in the area. If no lifeboat or liferaft is in the area, it also provides some time for rescue to arrive."

> *A human body cools when immersed in water of a temperature less than 92°F. The warmest open ocean water in any latitude at any time of the year is 84°F.*

In 1991 the Coast Guard studied small passenger vessel casualties and "concluded that lifejackets, life floats, and buoyant apparatus had proven adequate (i.e. provided adequate water immersion survival rates) in all studied casualties where water temperature was 60°F or more."

The 59°F rule was "formalized" in ***Navigation and Vessel Inspection Circular (NVIC) 7-91***, "Determination of Cold Water Areas" and established 32°N and 32°S worldwide as the regulatory demarcation line for immersion suit regulations. The NVIC states:

"A critical water temperature **seems** to be around 15° C (59° F). To the unprotected person, water at this temperature is painful and hypothermia **seems to progress** much faster than in warmer waters. In water above this temperature, most people are able to survive at least several hours. (Emphasis added.)

Unfortunately, these conclusions are not supported by the scientific evidence, available since at least the mid-1940s, that most ocean water should be considered cold when considering all the impacts of immersion in cold water: cold shock, swimming failure, hypothermia, and post rescue collapse.

In a presentation to the Commercial Fishing Industry Vessel Safety Advisory Committee in November 2003 RADM Alan M. Steinman, USPHS / USCG (Ret) summarized the conclusion of a 2001 report, "Survival in Cold Water" prepared by Dr. C. J. Brooks for

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Marine Safety Instructor Training Scheduled

It's not too soon to think about attending the next session of AMSEA's six and one-half day Marine Safety Instructor Training (MSIT). It will be held April 5 through 11, 2011 in Seward, Alaska.

Although best known for preparing instructors to teach commercial fishermen, others who teach boating or cold-water safety also find this training extremely useful.

To learn more, or to register contact AMSEA at 907-747-3287 or visit us online. Find a calendar and descriptions of all of AMSEA's scheduled classes of all types at www.amsea.org

During a September 2010 MSIT course in Sitka participants learned shipboard firefighting techniques and used AMSEA's vessel damage simulator to practice emergency repairs at sea.
AMSEA photos.

Cold Water

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Transport Canada:

"Cold water (below 68°F) predominates in North American oceans, lakes and rivers. Merchant vessels sailing these cold waters need to provide adequate protection for their crews in case of accidental immersion."

But, a report of the Joint United States and Canadian Exposure Suit Development Group from 1943 summarizes what we need to know about the impact of cold water on the body, and states clearly that those impacts may occur on virtually any ocean at any time of the year.

A human body cools when immersed in water of a temperature less than 92°F. The warmest open ocean water in any latitude at any time of the year is 84°F. Individuals exposed to water of this temperature undergo significant cooling, and need the protection of a waterproof suit in the water.

Individuals even in warm climates, while sitting on liferafts lose body heat rapidly due to evaporative cooling, unless provided with a waterproof suit. The rate of loss of body heat increases rapidly as the temperature of the air and water falls.

It is long past time for the Coast Guard to revisit the definition of cold water. Clearly 59°F does not adequately define those waters where protective devices, specifically immersion suits and liferafts, are necessary survival equipment.

Richard Hiscock is a long-time safety advocate, former member of the Commercial Fishing Industry Vessel Advisory Committee, and an advisory for USCG Fishing Vessel Casualty Task Force. He recently spent two years as Senior Professional Staff on the Subcommittee on Coast Guard and Maritime Transportation of the U.S. House of Representatives.