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*Title: Development of a Hatch and Door Monitor System for Commercial Fishing Vessels*  
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Commercial fishing has historically been, and continues to be, the most dangerous industry in the United States. From 1994 - 2004 there were 641 crewmember fatalities, an average of 58 per year. In 2006, the fatality incidence rate was 141.7 per 100,000 employed, more than 36 times the National average of 3.9 per 100,000. Studies by the USCG found that just over half (51%) of all fishing vessel deaths are attributed to flooding, sinking, or capsizing of the vessel. Recent high-profile accidents of this class include, in 2001, the *Arctic Rose* with 15 fatalities; and, just last year, the *Alaska Ranger* and the *Katmai*, with 5 and 7 fatalities respectively. All 3 of these vessels sank in the heavy winter seas off western Alaska. Although the initiating event leading up to each of these sinkings may never be known, it is believed that open doors or hatches, particularly into the lazarette, may have contributed to down flooding of the vessels. Those hatches and doors that can subject a vessel to down flooding are considered 'critical'. Leaving them open inadvertently, or improperly securing them, compromises the vessel's weathertight integrity and puts the vessel at risk any time heavy seas are encountered.

To address this problem, in 2007, NIOSH engineers began the development of an engineering intervention to reduce the likelihood of down flooding through open doors or hatches. SRL staff met with vessel operators, the U.S. Coast Guard, and fishermen to discuss various design options. The final design, a 'Hatch and Door Monitor System', incorporates a variety of sensors mounted directly on all critical doors and a 'green board' on the bridge to indicate their status. Prototype Hatch and Door Monitor Systems have been installed on two vessels and are currently being tested in waters off Alaska.

This presentation discusses the basis for research into down flooding, engineering intervention options, details of the monitor systems as installed, initial results of sea trials, and recommendations for additional development.