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September 17, 2010

Dr. J.S. Spencer
Director, Office of Marine Safety
National Transportation Safety Board
490 L'Enfant Plaza, SW
Washington, DC 20594-0001

Dear Dr. Spencer,

As part of our participation in the NTSB forum on fishing vessel safety to be held on October 13 and 14 of this year, I would like to place the following information in the record for Panel 2, Vessel Issues that Impact Safety.

This information is based on both my personal experience and the corporate knowledge of my employer, Jensen Maritime Consultants (JMC). JMC has provided naval architecture services to the West Coast and Alaska fishing industry for nearly 60 years. While we have done some work in other regions, most of our experience is in the West Coast and Alaska fisheries.

Maintenance issues with commercial fishing vessels

As with any piece of equipment, maintenance is critical for safe operation of fishing vessels. In particular, maintenance of watertight integrity is extraordinarily important. A substantial percentage of sinking and capsizing events start with a flooding incident. Looking back at the major Alaska fishing catastrophes, the ARCTIC ROSE, BIG VALLEY, ALASKA RANGER, and KATMAI all sank in part because of failures in watertight integrity. The ARCTIC ROSE and BIG VALLEY disasters alone accounted for one quarter of all fishing fatalities in Alaska between 2001 and 2007.

Some aspects of the watertight integrity problem can be addressed through vessel surveys. For example, rudder packing or sea valves in poor condition can be identified and replaced during drydock surveys. Corroded hull plate can be replaced. On the other hand, proper maintenance of watertight doors, hatches, and overboard discharges depends on education of the crews. If the crew does not see the importance of keeping doors closed, the doors will be left open.

Overall maintenance of the vessel is also important to the general safety of the crew. The fishing fleet is steadily aging, making maintenance and repair more difficult. Because of regulatory requirements and economic issues, the fleet is being replaced at a very slow rate. In most of the world's cargo fleets, a 25-year-old vessel would be on the verge of retirement. In 1996, the fishing fleet over 79 feet long averaged 24 years old. In the intervening years, there have not been major fleet replacements that would reduce that age.

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Issues with modifications of existing vessels and stability

Fishing vessels are in a constant state of change. These changes can include major conversions, where boats are widened, lengthened, and/or deepened or major changes in fisheries. When major structural changes are made to a boat, most fishing vessel owners will work with a naval architect to make sure they get the results they want.

Complete changes in fishery are less common than in the past, partly because of consolidation of the fishing fleet. Done properly, these conversions can result in safe vessels. However, in some cases, vessels are converted without consideration for how the higher vessel loads would impact stability. This often results in vessels being loaded well beyond their safe limits.

Many fishing vessels, particularly smaller vessels, participate in several fisheries throughout the year. For example, is would not be uncommon for a single vessel to operate in seine, trawl, and two different crab fisheries in a given year. If the vessel has a stability report, it would be important to ensure that it gives instructions for all of these fisheries.

Even if a vessel makes minor changes to the fishery, there can be major changes in deck equipment and vessel loads, even if the fishing methods are relatively similar. For example, most boats fishing for Alaskan brown crab use similar gear to the more familiar king or opilio crab fisheries, but also have heavy line bins and pot haulers. The fisheries are only a few hundred miles apart and use similar crab pots, yet a brown crabber might carry several thousand pounds more deck load than a king crabber.

Within a single fishery, there are also constant changes. Vessel owners regularly change fishing gear or deck machinery. Fish processors also regularly change out or reconfigure processing machinery. Engines and generators are replaced on a regular schedule over several years. In most cases, the new equipment is heavier than the old.

Finally, even with no major gear or machinery changes, most vessels gain weight over time. This is due to many small changes such as new paint, electronics, lifesaving or safety gear, tools or spare parts, etc. While these changes are small individually, they can be quite large in aggregate. Based on in-house experience, JMC normally estimates that a fishing vessel will gain about one half of one percent of its weight every year. The U.S. Coast Guard requires that fishing vessels over 79 feet in length have new stability instructions after a 3% weight change. Five to seven years after stability instructions are issued, most fishing vessels will reach this threshold.

While we recommend that fishing vessel owners perform new stability tests every 5-10 years, in most cases there is no regulatory requirement that they do so. I have seen a 40-year-old stability booklet on board a fishing vessel. This booklet is clearly out of date. If nothing else, the booklet would not meet the current requirements in 46 CFR Part 28. However, there is no regulation that the Coast Guard could stand on to require that the owner update the booklet.

Design problems with commercial fishing vessels

Naval architects face several challenges in designing new vessels or modification to existing vessels. One of the largest is making room for change. As an example, JMC designed a small catcher-processor vessel in the early 1980's. At the time it was a state-of-the-art vessel, with a processing capacity of about seven tons of fish per day. That vessel is still operating, and it now processes 40 to 45 tons per day. Not surprisingly, there is far more and larger deck gear and processing equipment on board now than when it was first designed.

All of the conversions and changes discussed above can be made safely if proper thought is given to the safety and stability of the vessel in the early stages. In some cases, the changes needed to make a safe finished vessel make the project too expensive. That doesn't necessarily mean that the design process was unsuccessful—it means that we found out that a project was not feasible before the major costs were incurred.

Another issue naval architects face is the lack of required design standards designed for fishing vessels. While most naval architects use classification society rules for most of our designs, these rules are generally developed for larger ships rather than small fishing vessels. These rules are useful for general guidance, but they are not designed for vessels under 79 feet long.

We are fortunate in that most of the vessel owners in our area, particularly those who operate in Alaska, are aware of the impacts of changes to their vessels. We can credit this in large part to the substantial efforts of the Coast Guard and local safety training organizations. For example, a decade ago the Coast Guard began boarding king crab vessels prior to the start of each season to check for overloading and for compliance with basic life safety requirements. While those checks were controversial at the time, they have become standard practice over the years. Both the North Pacific Fishing Vessel Owner's Association Vessel Safety Program (NPFVOA) and the Alaska Marine Safety Education Association (AMSEA) have taught stability classes for several years in addition to their other safety classes. JMC staff provided technical assistance to both of these organizations as they developed their stability classes.

Naval architects and stability

JMC has put a significant effort into making our stability booklets as user-friendly as possible for fishermen. Our stability booklet format includes a set of text instructions followed by one or more loading tables or graphs. By reading only three or four pages, the vessel operator can have a complete picture of how to operate the vessel safely. The loading tables show allowable deck loads for any given combination of fuel and hold loadings. These types of instructions are very user-friendly and are generally well understood by vessel crews. It is extremely important not to make the vessel operator sift through dozens of pages of data to find out if the boat passes stability. This type of stability booklet will never be used.

It is also important that the naval architect consult closely with the operator and owner while developing the stability booklet. In general, the tank and hold loading sequences should match what the operator already does. By tailoring the booklet to the vessel, we can increase the

chances that the stability instructions will be followed. This consultation is far easier when the naval architect is familiar with fishing operations and can "speak the same language" as the fishermen.

In some fisheries, computer-based methods of calculating stability on board the vessel are gaining popularity. While these methods do not completely replace the stability booklet, they can make it far easier for operators to quickly check if their vessel meets the stability criteria. This is particularly true on larger and more complicated vessels.

In summary, naval architects have an important role to play in vessel safety and stability, from the first blank sheet of paper used for the design to the end of the vessel's useful life. Nationwide, approximately 55% of all fishing fatalities between 1992 and 2007 were caused by sinking, capsizing, or flooding events, all of which are within the naval architect's area of influence. However, we need to partner with vessel owners, regulators and education groups to have the most impact.

I appreciate the opportunity to give you this information and to participate in the fishing vessel safety forum.

Best regards,

JENSEN MARITIME CONSULTANTS, INC.

Eric Blumhagen, P.E.
Chief Naval Architect