

**An Open Door to Tragedy  
Coast Guard releases Arctic Rose report**

With watertight integrity they'd have had no problem that night," said U.S. Coast Guard Capt. Ronald J. Morris, speaking of the Arctic Rose and the 15 crewmembers who perished April 2, 2001, when the trawler capsized and sank in the Bering Sea.

Morris' terse comment summarized the official report issued in December 2003 by the Commandant of the Coast Guard and the three-man Marine Board of Investigation that Morris chaired. The report came nearly three years after the incident. Delayed by Homeland Security issues and an exhaustive scenario analysis carried out by the Coast Guard's Marine Safety Center in Washington, DC, the report concluded that an open weathertight door at the starboard aft corner of the processing space most likely allowed seawater to enter the vessel, thus beginning a rapid sequence of progressive flooding that capsized the trawler in roughly two-minutes time. Four- to eight-minutes later, the vessel sank.

Underwater videos confirmed that the door between the processing compartment and the aft trawl deck was open and that an overboard chute for discarding bycatch was only one-third of the way closed, allowing free entry of seawater into the processing area. Once the water entered the processing space through the open door aft, it had no way to clear the compartment because the vessel was trimmed forward and the scupper drains in the deck had been plugged with pipe caps. The weight of the water against the inside shell of the processing compartment exaggerated the roll to starboard as the helmsman turned the rudder hard to port in "a natural reaction to correct for a starboard list." Unfortunately that response only prolonged or increased the list to starboard. To this day the rudder of the Arctic Rose remains hard over to port on the bottom of the Bering Sea.

The particular construction details of the "head-and-gut" processing space contributed to the rapid flooding of the vessel. The fully enclosed box-shaped compartment occupied about two thirds of the former fishing deck. On the starboard aft bulkhead a weathertight door with six "dogs" opened to the trawl deck. The vessel's stability booklet required the door to be dogged shut at all times. Its location off the centerline, near the bulwark, facilitated the entrance of water if the door were left open and the vessel heeled to starboard. There was one other weathertight door fitted with "dogs" located on the forward bulkhead of the processing space, providing access to the mudroom, the galley and living quarters forward. This door was also on the starboard side of the vessel in direct line with the aft door to the trawl deck.

According to testimony given by former crewmembers at Board hearings, the weathertight door to the forward living space was regularly tied or blocked open, with only hollow-core household doors restricting the flow of water through the galley and into the staterooms. Additional testimony indicated that processing workers would open the aft weathertight door to provide ventilation while working in the confined quarters of the processing area.

The hatch from the processing deck to the frozen cargo hold below was not watertight due to a manhole opening fitted with a simple plywood cover. Free access to the engine room was provided by a flush deck trunk in the mudroom that was not fitted with a hatch of any kind.

Though the potential for progressive downflooding was clear, the conclusion of the Board admits, "The exact cause of this accident is not known."

There were no survivors of the incident, and no mayday was picked up either by the Coast Guard or a companion vessel, the Alaskan Rose, operating about 11 miles away from the scene. The first indication of trouble was a signal from the vessel's EPIRB, recorded at 03:35 the morning of April 2. The subsequent search recovered the body of Arctic Rose skipper Dave Rundall, clad in a water-filled survival suit. Two other bodies were reportedly sighted, but not recovered.

With no eyewitnesses, the Board had to rely on testimony from former crewmen, safety experts, naval architects, shipyard workers and others familiar with the vessel to piece together a picture of what might have caused the Arctic Rose to go down.

Following the hearings in Anchorage and Seattle and after two trips to the Bering Sea to survey the vessel with an ROV, the Board sought to apply what it had learned. With the assistance of USCG Lt. George Borlase and the Coast Guard Marine Safety Center in Washington DC, 19 different accident scenarios were developed, analyzed and rated for likelihood using the vessel's stability booklet, testimony about the vessel's construction, operation and condition at the time of the incident, and various calculation models dealing with the vessel's static righting arm, dynamic stability, capsizing resistance, propensity for progressive flooding, and time to sink.

Among the scenarios considered "very unlikely" was the theory that a rogue wave swamped the vessel. According to the MSC analysis, "Arctic Rose would have had to take on 500 tons of water in one wave period for [the] vessel to be swamped." Similarly unlikely was that a rogue wave capsized the boat, since the wave "would have to be at least 50 ft. high to capsize the Arctic Rose," and there were no such seas reported.

Other scenarios determined "unlikely or very unlikely" included through-hull fitting failure, collision, overloading, icing, trawl net snagging, rudderpost leaking in lazarette, loss of keel ballast, synchronous roll, shaft damage, and structural failure.

At the top of the list were three scenarios considered "most likely." All involved progressive flooding and capsizing. They differed only in the manner that water initially entered the processing space. The least likely of the "most likely" scenarios suggested that processing water valves may have been left on due to poor housekeeping practices by the processing crew.

According to the Board, the most probable scenario was "a combination" of two scenarios.

- "The vessel shipped water with quartering seas and the aft starboard door open to the processing space. The vessel rode best into the seas. The hull form was conducive to funneling the water on deck forward. Furthermore, the after deck arrangement with the dump box would limit the amount of surface area for the water to spread out. This would force the water depth to build up on the port and starboard sides. Any water entering the processing space would run forward due to the hull configuration. The Marine Board also heard testimony attesting to the fact that the crew kept the vessel trimmed forward; this condition

would allow the water to flow forward... The vessel needed to take a 23° roll to starboard with two weathertight doors open... to arrive at the critical stage and begin to take on water.

- “The vessel shipped water while turning to port to alter course and the aft weathertight door was open. The time of the sinking was about the time the vessel would turn downwind to get to the desired position (area where they caught a “clean bag” of fish) for their first trawl in the morning. A wave, most likely a secondary wave, lifted up the vessel's stern and dug the starboard side and bow into the water. The mate put the rudder to port to counter the list. The Arctic Rose capsized to starboard and then filled with water through the open weathertight doors located forward and aft on the starboard side of the processing space...”

And 15 men perished.

---

### ***Alaska Fisherman's Journal***

April 2004, page 12

#### **The Unanswered Question— Should the Arctic Rose have sailed at all?**

I think if I had this information and I had seen this particular stability book, I would not have gone on the Arctic Rose.”

That's what former first mate Tom La Ponte told the Coast Guard Marine Board of Investigation when he was shown a copy of the stability booklet developed for the Arctic Rose by Jensen Maritime Consultants of Seattle.

Walking through the booklet with investigators at the hearings that followed the tragedy in the spring of 2001, La Pointe described a series of operating procedures aboard the 93-foot H&G trawler that were specifically forbidden by the vessel's professional operating guide.

The booklet noted that a codend of fish should never be placed on the foc'sle deck on top of the processing space. Yet La Pointe testified that portions of fish loads in excess of 10-12 tons had to be placed up on the foc'sle deck since there was not enough room for them in the dump box on the trawl deck aft. Consequently the load was pulled atop the processing space in between the port and starboard trawl winches.

“When I was towing, I was aiming for a full bin—10-12 tons—that's a full bin,” La Pointe recalled. He also testified, “There were occasions when we hit catches in excess of 12 tons.”

The stability booklet for the Arctic Rose noted that the maximum deck load for the vessel was 22,000 pounds under the most ideal conditions. All deck loads identified in the loading table were supposed to include the weight of any fish that remained anywhere in the processing line or plate freezers. So, in order to be in compliance with the stability booklet, the maximum fish haul of 11 tons could only be brought aboard if the holding bins, conveyor belts and plate freezers in the processing area were completely empty of fish. In addition the freezer hold would have to have between 100,000 and 150,000 pounds of cargo in it before such a codend could be pulled (see table). Further complicating the matter, the Arctic Rose had to be almost fully fueled at the time of the haul (between tanking condition A & B at the top of the table).

How the Arctic Rose could ever get itself to that loading condition while operating inside the safety envelope of the deck-loading table is another mystery. According to the loading table, the boat was required to have 25,000 pounds of something already in the fish hold before it could even leave the dock. If the cargo load were less than that, the loading table clearly stated, "DO NOT OPERATE."

Eric Blumhagen of Jensen Maritime Associates was the engineer in charge of performing the incline test and doing the stability calculations for the Arctic Rose when it was undergoing a major re-outfitting in Seattle in 1999. In his testimony to the Board, he recalled a conversation he'd had with vessel owner David Olney. Blumhagen told the Board that Olney had asked what sort of weight he could put into the cargo hold, and Blumhagen told him, "It didn't matter what the weight was...concrete blocks, steel bars, fish or packaging."

Whatever it was, the vessel was not supposed to leave port without it, and the weight in the cargo hold would have to increase as the vessel burned off fuel. Presumably the additional weight would be processed and frozen H&G groundfish. As the vessel burned fuel, it had to be catching fish. But adding enough weight to compensate for the fuel burned could have been a tedious process for a skipper and crew if they wanted to remain inside the safety envelope of the loading table.

To remain in compliance, a skipper could only haul a series of 5,000-pound codends until the vessel had accumulated 50,000 pounds of total weight in the cargo hold. Complicating the process further is that all of the fish in each 5,000-pound tow would have to be dealt with before the skipper could haul another codend.

If, for example, the vessel were targeting flathead sole as it was in April of 2001, the recovery on the headed-and-gutted fish would be about 70%. Bycatch of other non-target fish was reported at about 40%. So, if the Arctic Rose discarded 2,000 pounds of bycatch and packed 70% of the remaining 3,000 pounds, that would add only 2,100 pounds of finished product to the cargo hold after each tow.

At that rate, it would take 12 tows to add another 25,000 pounds to the cargo hold to reach the 50,000-pound threshold allowing the skipper to increase the size of each subsequent tow to 17,000 pounds.

Complicating matters further, however, would be the burn off of fuel. Once the vessel burned 2,700 gallons of diesel, the size of the allowable catch would have to shrink drastically—to just 3,000 pounds per tow—unless the cargo hold already contained more than 100,000 pounds.

Assuming that the 25,000 pounds of artificial weight never left the cargo hold, how could the Arctic Rose pack 75,000 pounds of finished H&G product before it burned 2,700 gallons of fuel?

How could the vessel turn a profit if it had to begin each trip hauling 5,000-pound tows and then reduce its hauls to 3,000 pounds before 20% of its fuel was burned?

That was the scenario former mate Tom La Pointe pondered before investigators at the Board hearings in Seattle. La Pointe had already acknowledged that the Arctic Rose did

leave port with an empty cargo hold and that he was “quite happy with a 6- to 8-ton tow” early on in a trip, before he began fishing “hard.”

That suggested his first tows averaged 14,000 pounds. Presented with the stability book's requirement that no more than 5,000 pounds be hauled early on in a trip, La Pointe said, “I don't believe a two-and-a-half-ton tow aboard a factory trawler is going to make it. You need to do more than that to make a living.”

According to Blumhagen's testimony, the vessel owner wanted to do a lot better than that when he had major work performed on the vessel in 1999. The architect told investigators that Olney had hoped the vessel could pull a 20-ton codend—representing a deck load of 40,000 pounds—by the time it went back to sea. He also said Olney wanted to bring the codend on top of the processing deck.

Not only did Blumhagen deliver a stability booklet that severely limited the allowable deck loads on the Arctic Rose, but it specifically prohibited hauling fish on top of the processing space. And it specifically instructed the owner not to use the fuel in the double-bottom tank.

Questioned about the discrepancy between the owner's wishes and what he delivered in the stability booklet, Blumhagen acknowledged that the operations of the Arctic Rose would be “significantly restricted.”

Asked whose responsibility it was to adhere to the restrictions as set forth in the booklet, Blumhagen told the Board it was the operator's responsibility.

“How he operates is the master's decision and not something a naval architect can control,” Blumhagen testified. “We cannot stand over their shoulder to insure that they do.”

What they did do aboard the Arctic Rose was a lot more than leave the door open to the trawl deck. According to sworn testimony, they hauled codends that significantly exceeded the limits of the deck-loading table. They brought fish on top of the processing space. And they burned fuel from the double-bottom tank.

Despite those activities—presumably carried out to make the Arctic Rose more profitable—the vessel was unable to retain a seasoned crew because, as testimony indicated, it was still not possible for processing workers to make enough money aboard the Arctic Rose.

So, why was the Arctic Rose fishing at all?

---

***Alaska Fisherman's Journal***

April 2004, page 13

**Ten Tons of Misunderstanding Coast Guard misplaces 20,000 pounds**

Looking at the loading table from the Arctic Rose stability booklet, one might wonder why the vessel left the dock at all. According to the table, the boat couldn't sail without 25,000 pounds of something already in the hold. And according to the table, the first bags of fish brought aboard could weigh no more than 5,000 pounds.

Others might conclude, as former first mate Tom La Pointe did when presented with the table, "You need to do more than that to make a living."

However, the deck-loading table in the Arctic Rose stability booklet was not entirely accurate. And it's unfortunate that the official report on the accident, compiled by the Coast Guard Marine Board of Investigation, did not acknowledge the magnitude of the error.

The calculations that created the Jensen Maritime Consultants table did not account for all of the baseline weights aboard the vessel. Most significantly the table did not account for 20,000 pounds of concrete and steel "boiler shot" added to the bilge of the Arctic Rose after naval architect Eric Blumhagen had already performed the incline test for the Arctic Rose.

If the deck-loading table from JMC had accurately represented the as-built condition of the Arctic Rose as she left Dutch Harbor in March of 2001, it would have been easier for investigators to determine whether the vessel was operating inside the stability envelope when she sailed from the dock. And it would have been easier for a prudent skipper to determine whether his operating procedures were appropriate.

JMC architect Eric Blumhagen testified to the Marine Board that he did not learn of the concrete and steel mixture until after the Arctic Rose sank. Vessel owner David Olney testified that he added the concrete mixture to improve the stability characteristics of the vessel after learning from Blumhagen that some sort of weight would be required in the cargo hold before the vessel sailed.

Nevertheless, the Coast Guard report concludes that Olney was mistaken. On page 39, the report states, "Mr. Olney testified to his belief of meeting the operating chart through the addition of weight with the keel shoe and boiler plate cement mixture. In fact, this is in error as these weights were accounted for in the JMC stability calculations."

However, it is the Coast Guard report that is in error. In a February 2004 email to the Alaska Fisherman's Journal, and in a subsequent telephone interview, Blumhagen affirmed his previous testimony to the Marine Board. In the email he wrote, "The 20,000 lbs of concrete/steel was not specifically accounted for in the report and the loading table on p. 37 of the USCG report."

He had told the Coast Guard the same thing at the Seattle hearings, under oath, back in 2001.

He also acknowledged Olney's attempt to improve the vessel's stability by adding the weight. Blumhagen stated in the phone interview, "It was the right thing to do, but we didn't know about it to update the booklet."

Blumhagen said that Olney should have come back to JMC to have them recalculate the loading table, but Olney did not. He also noted that JMC "never did produce that table," even after the sinking, indicating that the calculations would take both time and money that was never budgeted for the task.

So, was the stability table for the Arctic Rose useful or useless? That depends.

Blumhagen suggested that the 20,000 pounds of added weight to the bilge could have compensated for the 25,000 pounds of additional weight required by the stability table. If a prudent operator had been aware of that, he said, he could have used the table, beginning on the second horizontal row of loading information. In which case it may have been safe to sail the Arctic Rose with the hold empty, since the additional weight was already built into the vessel.

Would the extra weight have allowed the operator to pull a larger bag of fish?

Blumhagen said the new information would “not necessarily” change the operating recommendations for the vessel.

Asked whether it was prudent to burn fuel from the double-bottom tank, Blumhagen said, “If they burn fuel in different order, then they should go to a naval architect to get it [the table] updated to match how they operate. Depending on the boat, the whole table can go out the window if they burn fuel in a different order.”

Asked about stability booklets in general, Blumhagen said there are no “fudge factors” built into JMC stability booklets.

“What happens there is we go right up to the stability criteria limits,” Blumhagen said.

“Everybody else does, too,” he added, suggesting that naval architects who reduce loading tables to build in an extra cushion of safety don't get much business.

“That's not to say if they had loaded 5,500 pounds, the boat would have rolled,” he explained, speaking of the Arctic Rose, “but they would have been eating into the margins.”

How much did Olney improve the operating parameters of Arctic Rose by adding the concrete and boiler shot? It's good question—one that isn't answered by the current Coast Guard report.

Presumably a revised stability booklet would never have allowed an operator of the Arctic Rose to compromise the watertight integrity of the processing space. However, a booklet that reflected the true safe-loading parameters of the vessel could surely have helped a responsible skipper operate more safely.

Having a revised table in the final Coast Guard report would also help the Coast Guard and the public understand whether it was a wise decision and a responsible decision to untie the Arctic Rose from the pier and attempt to fish it profitably in the Bering Sea, in winter, with 15 people aboard.

Asked to comment on the 20,000 pounds and the accuracy of the stability-loading table in the Marine Board report, members of the Coast Guard Board of Investigation offered no response by press time.