



In what might have been the last picture taken of the *Edmund Fitzgerald*, she unloads at Great Lakes Steel at Zug Island on the Detroit River on Oct. 26, 1975.

Remembering the *Fitzgerald*, with focus on safe passage

By Patrick D. Lapinski

Every autumn, and especially in the notorious month of November, the maritime community acknowledges with sorrow a tragic milestone: the loss of the steamer *Edmund Fitzgerald* on Nov. 10, 1975.

Now four decades removed, that incident still resonates deeply within our maritime community. Every year brings new commemorations, while books, videos and photographs of the *Fitz* and other stories of loss continue to pour out over the Great Lakes maritime industry. Often they blur the lines between fact and fiction.

Noted Great Lakes maritime historian Fred Stonehouse, author of *The Wreck of the Edmund Fitzgerald*, one of the seminal books on the ship, spoke at the Gales of November maritime conference in Duluth in early November and at the bell-

ringing ceremony at Whitefish Point later in the month. In reflecting on the 40th anniversary of the loss, Stonehouse said the ceremonies serve a valid purpose.

"Commemorating the loss," he said from his home in Michigan's Upper Peninsula a few weeks before Gales, "helps all of us remember the men who make their living on the Lakes, and their families and their loved ones."

Stonehouse also believes the loss serves to remind us of the bigger picture. "By remembering *Fitzgerald*, we not only honor that wreck and their families, but I think we in measure honor all of the other wrecks," he said. "If by remembering *Fitzgerald*, it also introduces a little note of caution to other operators on the Lakes; that, too, is not a bad thing. In balance, there are very positive reasons, I think, to remember *Fitzgerald*."

From an industry perspective, Jim Weakley, president of the Lake Carriers' Association, offered his thoughts on the *Fitzgerald* and the current state of the Great Lakes maritime industry. "We urge all to respect the feelings of those who have lost loved ones on the ship and mark the occasion appropriately," he said from his office in Cleveland. "For industry, that means building on our excellent safety record."

"As the expression goes, that safety record is no accident. The industry is continually looking at ways to enhance safety, be that personal-protection equipment or navigation and communications equipment and systems. Today's mariner has tools unthought of years ago, and future generations will be able to avail themselves to things we can't even imagine now."



Frederick Stonehouse

With that, let us turn our attention away from yesterday and loss and on to today and the new realities of the Great Lakes maritime industry.

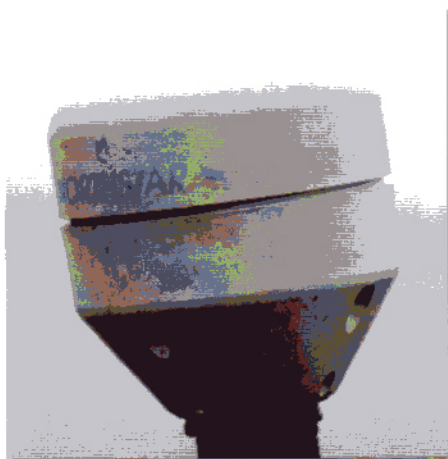
The simple fact is that the Great Lakes maritime industry is incredibly safe and stable. Admirably, the maritime industry has come a long way not only in vessel design and construction, but also in providing safe and healthy working environments on the water and ashore.

That position is put forward by advocates of the Great Lakes St. Lawrence Seaway system and supported by many maritime organizations, such as the Lake Carriers' Association and the Chamber of Marine Commerce (CMC) in Ottawa, who make the case for waterborne commerce as the most economical and environmentally friendly and, most important, safest option among the nation's transportation sectors.

In the spring of 2014, an extensive 18-month study, "Safety Profile of the Great Lakes St. Lawrence Seaway System," was released. The report was the first major research supporting the industry's safety record available for public consumption.

The study, commissioned by the CMC and conducted by Research and Traffic Group, an Ontario transportation consulting organization, analyzed safety data collected from Canadian and American government sources covering the 10-year

Advances in maritime technology



Transmitters handle everything from GPS information to satellite communications and television.



This screen is part of the system that provides real-time engine data to the pilothouse and other stations.



The Sperry Navpilot 4000 steering stand on the *Hon. James L. Oberstar* is tied to the ship's gyrocompass.



Forward mast and long-range radar antenna. The ship also has a short-range unit.

All photos taken aboard the *Hon. James L. Oberstar*

Photos by Patrick D. Lapinski

period ending in 2011 — information based on an estimated 69,960 vessel trips.

Stephen Brooks, CMC president, said the study "clearly showed that marine is the safest way to transport goods in the Great Lakes. Ships have little to no negative impact on public safety and significantly lower employee incident rates than other modes of transport."

Many practices factor into the safe operation of vessels on the Lakes. Broadly speaking, vessel safety falls into several categories, such as structural safety, workforce training, communication and navigation and weather and environmental conditions. Similar to the blocks of a building's foundation, all of these, when combined, serve to support the entire structure with

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SHEET NO. 12

YEAR 1975

* Extended Season Letter, written by RBW - up to January 1

THE HANNA MINING COMPANY DI

Lake Superior

DATE SHEET STARTS

November 16th

17th

18th

19th

20th

21st

22nd

23rd

24th

25th

26th

27th

28th

29th

30th

December 1st

2nd

3rd

4th

5th

6th

7th

Piers	Dock	Remarks	No.	VESEL	Time Arrived	Time Finished	GRADE	Tons	L/B	Telex	Consigner
					Hour Date	Hour Date					
Piers: 2 ³⁵		John O'Brien Abid # 2/10hrs.	223.	J.H. Thompson	3:15 7in	8:40 7in	National Pellets	21128	IX	IX	Hanna Ice, Jelfon
			224.	Raymond Reiss	6:15 7in	12:30 7in	Brooks Coarse	12046	IX	IX	Hanna Ice, Boffe
			225.	G.M. Humphrey	4:50 5P 8in	10:05 8in	Itasca Pellets	24414	IX	IX	Quebec Ice, C&F
Piers: 11 05P		New fluid # 11/10hrs.	226.	K.G. Wein	11:40 5P 8in	4:15 9in	National Pellets	21930	IX	IX	Hanna Ice, Jelfon
Sank 7:10 P 10th			227.	K.G. Fitzgerald	10:55 9in	1:30 9in	National Pellets	26116	IX	IX	Hanna Ice, Jelfon
Piers: 10 ³⁵		Finland	42.	Wilhelm Suved	11:55 9in	4:15 9in	Billow Pellets	20248	IX	IX	Finland, Steel & Ind

In his capacity as vessel agent for the Hanna fleet, Richard "Dick" Bibby noted on this spreadsheet that the Fitzgerald finished loading 26,116 tons of pellets at Burlington

American vessels on the Great Lakes are primarily inspected and classified by the American Bureau of Shipping (ABS) and in Canada by Lloyds Register of Shipping and DNV GL. These agencies work in conjunction with the U.S. Coast Guard and Transport Canada to verify compliance with regulations specific to the Great Lakes domestic trade.

The pilothouse of today's Great Lakes freighter is a technological marvel. At night the space is aglow with instrument panels that aid the pilot and wheelsman. Most of today's electronic enhancements are not directly attributed to the loss of the *Fitzgerald*, but to two significant contributions to the pilothouse that came within a few years of the loss, most notably depth finders and Loran-C.



Courtesy Richard Bibby



Roger Lelievre

rate position. Loran-C technology came to the Great Lakes in 1980, another step in navigational sophistication. To show how fast technology can change, in just a few short decades the Loran-C equipment has been replaced by newer GPS and AIS, or Automatic Information Systems, and is no longer in use.

Loran technology, developed in the 1940s, was based on continuous, low-frequency radio transmissions from land-based beacons to give a vessel an accu-

PORTS		VESSELS LOADED							VESSELS LOADED							REMARKS					
Tu	W	Th	F	S	S	M		Tu	W	Th	F	S	S	M		Tu	W	Th	F	S	
18	19	20	21	22	23	24		9	10	11	12	13	14	15		16	17	18	19	20	
Cleared Piers		Date		Time		Telex		Draft		Delays		Undlg Port		Hours							
7th		9:10 A		TWX		(26-6 & 26-10)		1:00 shift		2:25 H2O		(ETA) Yefreit		1100 Sunday		9th (50)					
7th		12:45 P		TWX		(20-0 & 20-4)		None logged other than trouble		1:30 H2O		(ETA) Bflo		1500 Monday		10th (74)					
8th		10:25 P		TWX		(26-6 & 26-10)		1:00 shift		3:00 H2O		(ETA) Cleve		0900 Tuesday		11th (58%)					
9th		4:40 A		TWX		(27-4 & 27-7)		1:45 shift		3:00 H2O		(ETA) Yefreit		1000 Tuesday		12th (44%)					
9th		1:55 P		TWX		(27-0 & 27-6)		1:45 shift		1:00 H2O		(ETA) Yefreit		1830 Tuesday		12th (50%)					
10th		4:30 P		TWX		(27-0 & 27-6)		3:00 shift				(ETA) Yefreit		0430 Wednesday		12th (50%)					

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Electronic charting and navigation technology came to the Lakes in the early 1990s. Canada Steamship Lines and the American Steamship Company became early adopters of the technology, with each fleet piloting similar a system on a select number of their vessels. By 1995 electronic charting and positioning technology had been installed on all Lakes vessels.

These systems use official nautical charts that are displayed dynamically in conjunction with satellite tracking to provide a vessel with real-time positioning. The use of GPS satellites, in conjunction with an AIS transponder, has greatly increased navigational capabilities and communication.

"The Seaway was the first waterway in North America to use an automated identification system, in 2002, and today that operates throughout the Great Lakes-Seaway basin," said Brooks, discussing the system's approach to safety.

Traffic monitoring on the Great Lakes is a part of the governance of maritime commerce shared by both Canada and the United States. Regulating bodies have the ability to observe all vessels within their respective control areas. These traffic control stations play a vital role in Great Lakes safety by helping to regulate and re-route the flow of ship movement during weather events such as heavy fog and ice, and in an emergency they can serve as a command center for a coordinated response.

The system can also pinpoint the exact location of a grounded vessel. Within seconds of an incident, vital information can be compiled on the vessel's cargo, the water current, weather, water levels, the pilot on board and the owner/operator/agent of the ship. Having such information readily available has dramatically improved incident response capabilities.

Nearly all of this technology and monitoring focused on safety is there to cope with the biggest obstacle on

the Lakes — the weather.

Some of the best real-time weather information comes directly from ships participating in the U.S. Voluntary Observing Ship (VOS) program, run by Ron Williams, port meteorological officer at Duluth [North Star Port, Spring 2015]. Williams helps train ships' officers



The pilothouse on a modern Great Lakes freighter is a marvel of navigation and weather technology.

in the arts of observation and weather codes and in transmitting that data back to the weather service.

A basic knowledge of weather is a critical part of deck officer training, one that harkens back to the days of wooden ships and iron men, when many a captain plotted his own forecast. "Almost every storm is spent looking at ship weather observations and updating forecasts to keep crews safe," said Williams.

Creating a culture of safety at sea is really no different than measures taken in workplaces ashore. All Great Lakes fleets operate companywide safety programs, and the vessel crews themselves conduct regular meetings during the sailing season to cover specific areas of safety and concern in addition to conducting mandatory drills such as fire and lifeboat training to hone their skills.

Since the loss of the *Fitzgerald*, historian and author Fred Stonehouse noted, vessels are now required to carry an Emergency Position Indicating Radio Beacon unit, as well as cold-weather immersion suits, technology that he says was available in the Pacific fishery well

before the loss of the *Fitzgerald* but not required at the time on the Great Lakes.

The U.S. Coast Guard and Transport Canada adapt international standards to the specific requirements of training and safety on the Great Lakes, specifically in the training developed on the Lakes for electronic charting. Staying ahead of the

curve means that mariners are spending more time in the classroom during the winter than on the golf course. New technology is important for safety, but owners also want more efficiency for their bottom line. One new piece of technology in active development is the Draft Information System (DIS), installed on 43 domestic Canadian vessels.

Brooks noted that ship owners are excited about this development. "It uses satellite-based navigation to pinpoint the exact location of a ship and hydrographic maps to model the channel's bottom in 3D," he said. "The system provides the ship's navigator with a color-coded map of the channel ahead of the ship. The colors on the map will change according to the ship's present speed. By adjusting the current speed (which affects the ship's draft), a navigator can ensure that the ship will safely transit every segment of the channel."

The bottom line is that this innovation can enable a ship to carry as much as 400-plus metric tons of additional cargo per Seaway voyage.

Achieving a high level of operation for ships on the Great Lakes does not

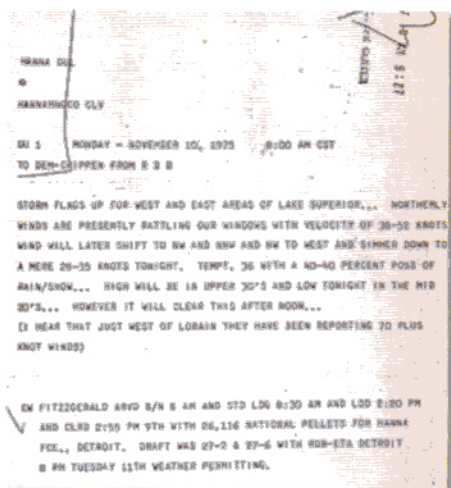
Patrick D. Lapinski

equate to complacency. Change is constant, and billions of dollars are being spent on fleet renewal, with safety and sustainability the top priority. "These vessels have smarter bridge layouts with floor to ceiling windows for enhanced navigation, infrared cameras to improve operations in low or poor light, more powerful bow thrusters to improve maneuverability in ports and restricted areas, improved fire suppression systems, better lifeboats ... the list goes on," Brooks said.

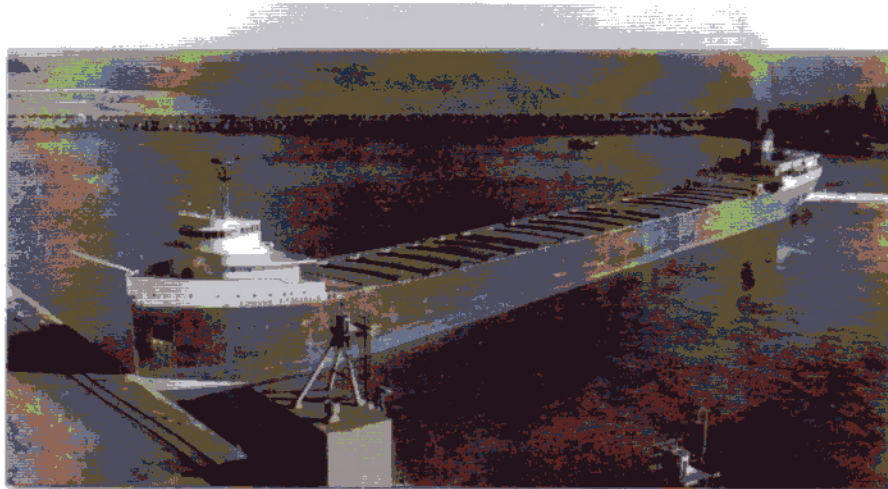
Whether the *Fitzgerald* could have survived with the use of today's technology is a moot point. The *Fitz* and its crew, along with every other vessel out in that November gale, had what was then considered the best technology available. The simple fact remains that sometimes a ship just gets caught and there's nothing its captain or crew can do.

Instinctively, or perhaps as a result of the *Fitzgerald* and other losses over the decades and centuries, vessel captains are notably more respectful of storms, believes Stonehouse. "The change I've seen I think has been an emotional change, from talking with crews," he says. "To them, *Edmund Fitzgerald* occurred last week. It's still something they live with; it's still something they're very aware of, it's something they're very conscious of."

Patrick Lapinski is a Superior native and a maritime photographer, historian and author.



Message from vessel agent Richard Bibby in Duluth to Hanna in Detroit on Nov. 10, 1975.



The *Fitz* executes a turnaround at Silver Bay before leaving with pellets.

Wesley Harkins, courtesy Richard Bibby

Loss drew attention to structural integrity

Vessel inspection and certification gained attention worldwide as far back as the mid 1700s with the development of independent vessel classification societies. The origins of these organizations came from a need to independently evaluate the integrity of a ship's hull and operating machinery to determine its insurable risk to survive a voyage. Keep in mind that sailing in the early 18th century was considerably riskier than it is today. As vessel construction and technology have evolved, so too has the role of classification societies.

Following the loss of the *Edmund Fitzgerald*, the structural integrity of the vessel came under intense scrutiny. (It is important to note, at the same time, that no definitive cause for the ship's loss has ever been conclusively determined.)

On the Lakes, ships undergo a continuous regimen of inspection and upgrades to machinery and maintenance. As part of the process, known as "surveying," all vessels are subject to out-of-water hull inspection, commonly called a five-year survey. Additional surveys are conducted for areas such as electronics, load lines, lifeboats and insurance and cargo. Aside from the independent surveys, vessel owners and operators all conduct their own inspection and maintenance programs for their vessels.

All Great Lakes freighters have come under intense scrutiny. "From a structural point of view, all vessels now have computerized loading instruments that are quicker and more accurate than manual calculations to ensure that the vessel is loaded safely and that stresses in the hull are within safe limits for the entire trip," said Stephen Brooks, president of the Chamber of Marine Commerce and a keynote speaker at Gales of November 2015 in Duluth.

"There have also been improvements in requirements for hatch openings on decks, hatch coamings and covers. Analysis showed that well-rounded corners on hatch openings, insert plates to increase local thickness and well-defined coamings [framing above deck around the hatch openings] have combined to prevent fatigue cracking."

Structural requirements for the hulls of fuel tankers, considerably more prevalent on the lower Lakes than in the western end of Lake Superior, also have changed.



Stephen Brooks