FREIGHTERS

Bi-Monthly Periodical on the Latest Great Lakes Shipping News
Edition #56 – March-April 2021
Official newsletter of Shipwatcher News – Since 2014 – Written by Brendan Falkowski – www.shipwatcher-news.com

Looking back: 2020 Season recap

EDITOR'S PICK

SHORT ARTICLES ON VARIOUS HAPPENINGS AROUND THE LAKES

COVID AND GREAT LAKES SHIPPING IN 2021

APRIL 13, 2021

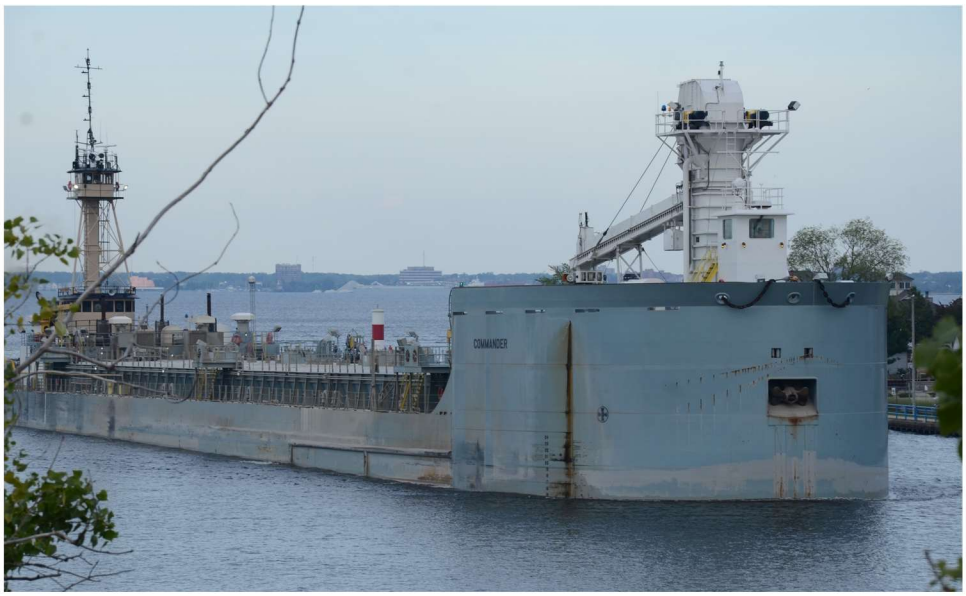
The Coronavirus has had a lasting impact on our world in many ways. It still has an impact on our everyday lives. Great Lakes mariners face an especially challenging situation, as COVID reaches closer to home.

Shippers were able to avoid any major outbreaks on their vessels during the 2020 season, but 2021 has not quite been the case. Two notable cases, onboard the tug-barge *Presque Isle* and the Canadian self-unloader *Atlantic Huron*, have sent the ships to the wall for several days. A crewmember onboard the *Presque Isle* tested positive in early April, and in the following days, several more members of the crew also tested positive. The ship quarantined at anchor off of Milwaukee, WI, for a few days before docking in the harbor to sanitize the vessel and conduct a crew change. *Atlantic Huron* encountered a similar situation, docking at Thunder Bay, ON, on April 8. It is unknown how the virus was introduced onto each vessel, as crewmembers must go through a screening process prior to boarding the ship.

Mariners are at a major disadvantage during the COVID-19 pandemic, as they are restricted to confined quarters onboard their vessels. Many Great Lakes ships have anywhere from 18 to 25 crewmembers, living onboard ships 1,000' long or less.

In order to help protect mariners, groups are trying to provide assistance in vaccinating crews. In Sault Ste. Marie, MI, the Chippewa County Health Department has been offering COVID vaccines to sailors who desire them. As downbound ships await their turn through the Soo Locks, they dock at the West approach to the Soo Locks. At the West pier, Health Department staff come onboard the vessel to distribute the vaccine to those who would like to be vaccinated. The ➲ Chippewa County Health Department was approached by both the Lake Carriers Association and U.S. Army Corps of Engineers to help distribute the vaccine in an effort to speed up the vaccination process of Great Lakes sailors.

There is still a long way to go before beating the virus, and crews still must adhere to strict safety standards and protocols to prevent the spread of COVID-19. With these ongoing challenges, there is a light at the end of the tunnel. Most of the Great Lakes fleet fit out at the beginning of the 2021 season, with only a few regularly-active vessels remaining at the wall. Demand has increased significantly as the steel industry rebounds after last year's shutdown. COVID-19 has presented a massive test, but Great Lakes shipping will surely overcome the challenge. ◘



Caroline McKee and *Commander* depart Muskegon, MI. Photo by Scott Musselman

CAROLINE MCKEE ENTERS GREAT LAKES SERVICE

APRIL 18, 2021

The tugboat *Caroline McKee* entered service, pushing the self-unloading cement carrier barge *Commander*. She was purchased in 2019 by Port City Marine Services, and underwent a refit at a shipyard in New Orleans, LA, in 2020. She arrived on the Great Lakes in July 2020, and was laid up at South Chicago for the remainder of the 2020 season, undergoing final preparations to push self-unloading cement barges. She departed South Chicago on April 18, 2021, pushing PC's barge *Commander*. The pair departed for Charlevoix, MI, to load cement at the St. Marys Cement plant for their South Chicago terminal. ◘

SOURCES:

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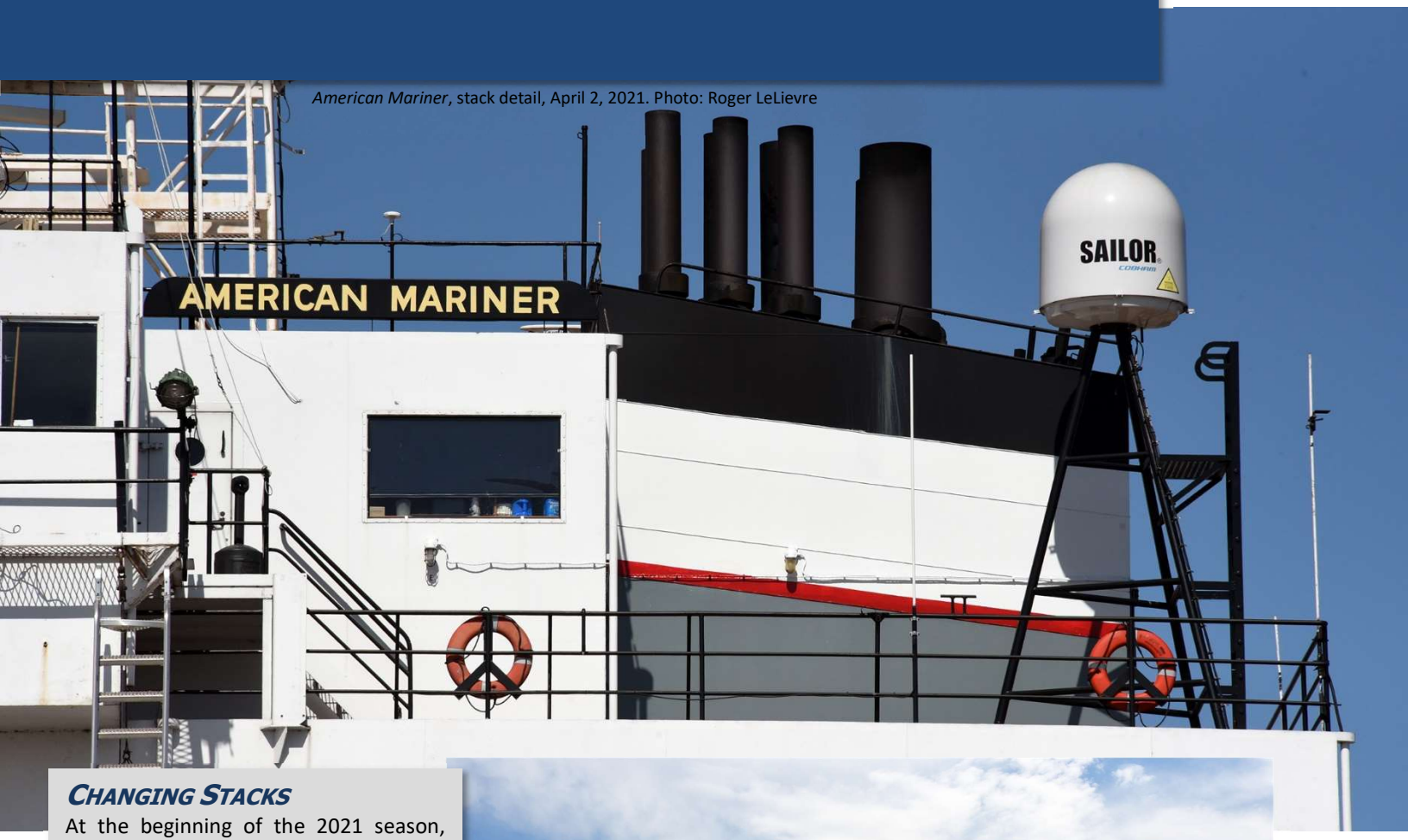
News in Photos

THE LATEST NEWS CAPTURED IN PHOTOS



American Mariner, stack detail, April 2, 2021. Photo: Roger LeLievre

Changing Stacks

At the beginning of the 2021 season, Grand River Navigation chartered five ships from American Steamship Company. *American Courage, American Mariner, H. Lee White, John J. Boland* and *Sam Laud* were all involved in this operation. Prior to entering service, their American Steamship stack markings were painted over with the Grand River black, white, red, and grey stack. Grand River's wheel logo was not applied to the stacks. The five ships will operate for Grand River for the remainder of the 2021 season. Any further changes to the vessels and their operations are currently unknown.□

John J. Boland downbound at Sault Ste. Marie, MI, April 16, 2021. Photo: Roger LeLievre

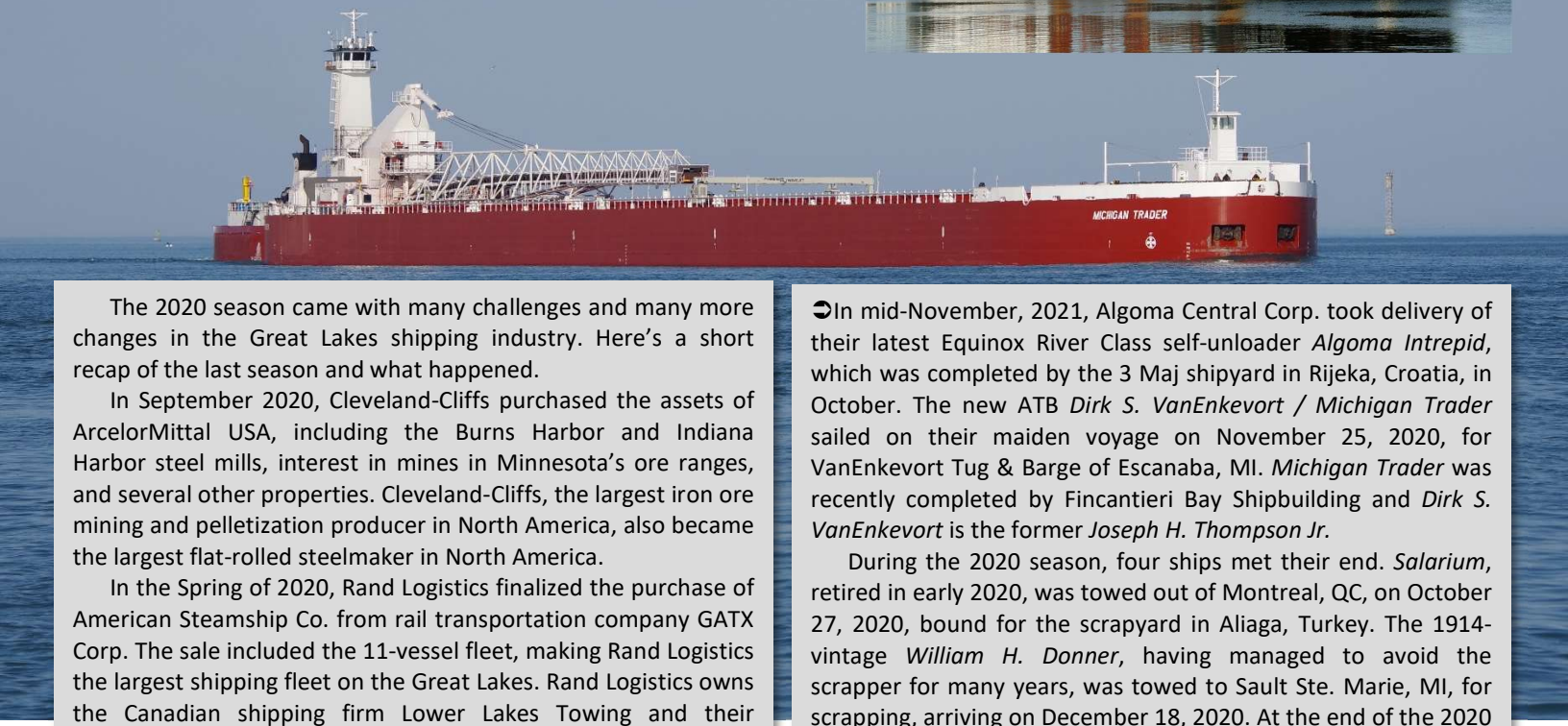
LOOKING BACK: 2020 SEASON RECAP

RECOUNT OF THE 2020 SHIPPING SEASON

MARCH 25, 2021

Michigan Trader / Dirk S. VanEnkevort entered service in November 2020. Photo: Isaac Pennock

Harvest Spirit on a trip down the St. Marys River on her first season under the Canadian flag, December 2020. Photo: Roger LeLievre



The 2020 season came with many challenges and many more changes in the Great Lakes shipping industry. Here's a short recap of the last season and what happened.

In September 2020, Cleveland-Cliffs purchased the assets of ArcelorMittal USA, including the Burns Harbor and Indiana Harbor steel mills, interest in mines in Minnesota's ore ranges, and several other properties. Cleveland-Cliffs, the largest iron ore mining and pelletization producer in North America, also became the largest flat-rolled steelmaker in North America.

In the Spring of 2020, Rand Logistics finalized the purchase of American Steamship Co. from rail transportation company GATX Corp. The sale included the 11-vessel fleet, making Rand Logistics the largest shipping fleet on the Great Lakes. Rand Logistics owns the Canadian shipping firm Lower Lakes Towing and their American-subsidiary, Grand River Navigation. In March 2021, Grand River Navigation chartered American Steamship's *American Courage, American Mariner, H. Lee White, John J. Boland*, and *Sam Laud* for the season.

In the final days of 2020, Interlake Maritime Services was formed to manage the Interlake Steamship Co. and their related companies. This followed Interlake's move to purchase the Lake Michigan Carferry Co. and Pere Marquette Shipping Co. Interlake acquired the historic carferries *Badger* and *Spartan*, as well as the articulated tug-barge unit *Pere Marquette 41/Undaunted*. The steam-powered passenger and car ferry *Badger* will operate as usual, and *PM41/Undaunted* will operate as usual for Interlake Logistical Solutions, the new name of Pere Marquette Shipping.

Several vessels were welcomed to the Great Lakes fleet, both new builds and used vessels. McKeil Marine purchased the tankers *Adfines Star* and *Adfines Sea* in early 2020, renaming them *Atlantic Spirit* and *Northern Spirit*, respectively. They continued their fleet expansion in September when they announced the purchase of the shallow-draft, crane-equipped, ocean bulk carrier *Juliana*. Upon her arrival in Canada, *Juliana* was renamed *Harvest Spirit*. ➲

➲In mid-November, 2021, Algoma Central Corp. took delivery of their latest Equinox River Class self-unloader *Algoma Intrepid*, which was completed by the 3 Maj shipyard in Rijeka, Croatia, in October. The new ATB *Dirk S. VanEnkevort / Michigan Trader* sailed on their maiden voyage on November 25, 2020, for VanEnkevort Tug & Barge of Escanaba, MI. *Michigan Trader* was recently completed by Fincantieri Bay Shipbuilding and *Dirk S. VanEnkevort* is the former *Joseph H. Thompson Jr.*

During the 2020 season, four ships met their end. *Salarium*, retired in early 2020, was towed out of Montreal, QC, on October 27, 2020, bound for the scrapyard in Aliaga, Turkey. The 1914-vintage *William H. Donner*, having managed to avoid the scrapper for many years, was towed to Sault Ste. Marie, MI, for scrapping, arriving on December 18, 2020. At the end of the 2020 season, both the *Algoma Enterprise* and *Mississagi* were retired. *Algoma Enterprise* was laid up at the Marine Recycling scrapyard in Port Colborne, where scrapping is now more than 50% complete. *Mississagi* was laid up at Hamilton, ON, but moved to Sarnia, ON, in April 2021, where she is currently being stripped of valuable parts.

On February 1, 2021, the *Roger Blough* suffered a severe fire in her stern section while in winter layup at Bay Shipbuilding. Damage was suffered to her unloading boom casing, as well as portions of her accommodations and engine room. A plan for repairs had not been announced at this time.

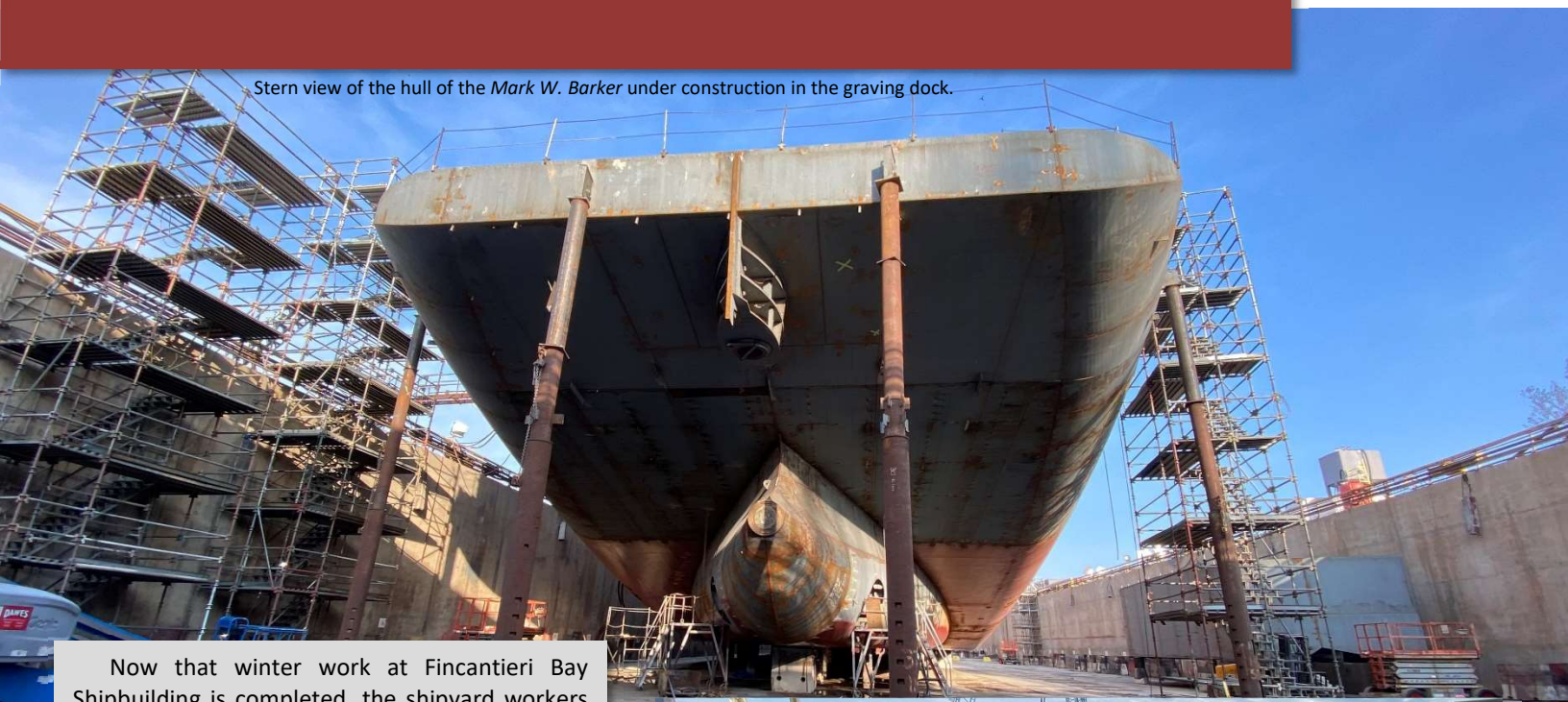
New ships are on the lookout, as Algoma Central awaits the arrival of their latest Equinox class ship from China. The *Captain Henry Jackman {2}* is expected to arrive in Canada within the next few months. Interlake Steamship Co.'s new self-unloader, *Mark W. Barker* is currently set for completion in 2022. See the next page for more details on her construction progress.◘

LeLievre, Roger. *Know Your Ships 2021.* Marine Publishing Co., 2021.

Construction Update: Mark W. Barker

Update on the construction of Interlake Steamship's new ship

October 16, 2020



Stern view of the hull of the *Mark W. Barker* under construction in the graving dock.

Now that winter work at Fincantieri Bay Shipbuilding is completed, the shipyard workers are busy installing the highly intricate structural modules for Interlake Steamship Company's new build, the M/V Mark W. Barker.

Following is an update on her construction at the Sturgeon Bay, Wisconsin shipyard:

Stern modules are being placed and welded while support beams stabilize that area of the structure. There is one section left to be put in place.

Most of the machinery is now installed or in position in the lower levels of the engine room. Piping and wiring are well underway in that area, including motor control centers and other electrical panels.

In the accommodations, bathroom modules are in place and they are working on air conditioning ducting and pulling wire through the multi-level structure which sits beside the vessel dockside.

In the pilothouse, all of the propulsion and auxiliary consoles are in position.

In the 311-fabrication building, bow sections are being constructed to complete the final 150 feet of the forward end of the hull.

Expected to be underway in Spring of 2022, the 639-foot vessel is making history as the first ship built on the Great Lakes for operation on the Great Lakes in more than 35 years. ◻

Special thanks to Chrissy Kadleck from Interlake Steamship Company for providing this update. Photos and update courtesy of Interlake Steamship Company.

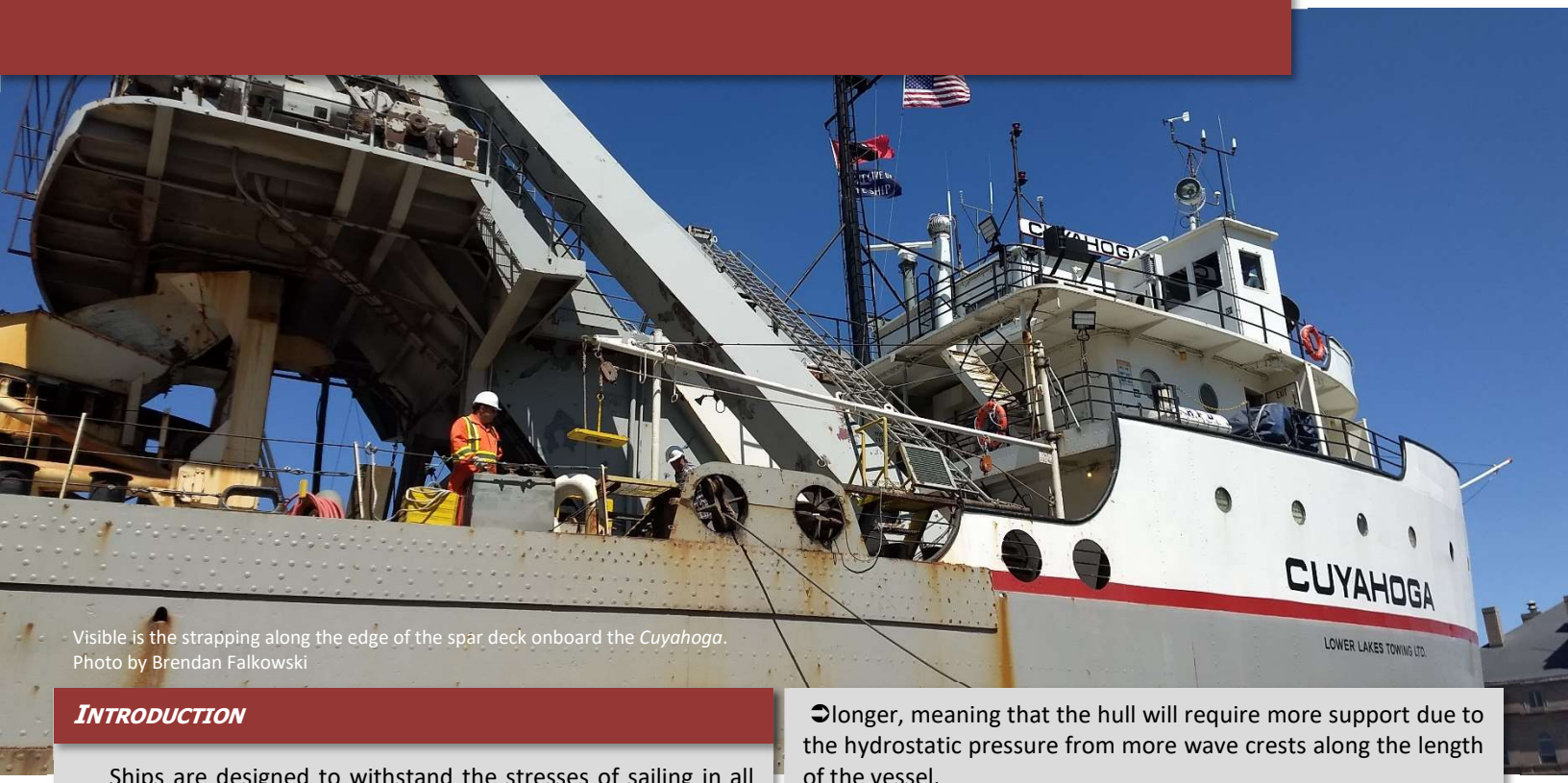
Two forward keel blocks added to the hull

Stern view of aft deck under construction

NAVAL ARCHITECTURE & MARINE ENGINEERING

IN THE DESIGN: HULL STRENGTH

A LOOK INTO HOW SHIPS ARE DESIGNED TO WITHSTAND THE STRESSES OF TIME AND WEATHER



Visible is the strapping along the edge of the spar deck onboard the *Cuyahoga*.
Photo by Brendan Falkowski

INTRODUCTION

Ships are designed to withstand the stresses of sailing in all seas. They encounter all kinds of sailing conditions while on the water. Great Lakes vessels are designed to special parameters to be able sail in the unique conditions found on the Inland Seas. A lot of effort of designing a ship is put into making sure that the vessel will be able to sustain the stresses of carrying cargoes and sailing through various sea conditions.

DESIGN

Classification societies, such as American Bureau of Shipping (ABS) and Lloyd's, all have developed their own rules regarding structural components of ships. These rules all fall under a global set of rules, set by IACS, the International Society of Classification Societies, which satisfy each of the individual classification society rules. These classification societies have developed rules to prescribe hull girder strength, moment of inertia, minimum section modulus, and more in accordance with the designed length, beam, and draft of a ship. There are also certain rules that are specific to the Great Lakes. Since lake vessels are regulated by lock-based design and are operating in more unique conditions, they are put out of the realm of normal length-beam-draft ratios. Great lakes vessels are typically longer in length but shallower in draft compared to ocean ships, and have a larger beam to draft ratio. Classification society rules have calculations for figuring spring or bending moment. These calculations take into account combined bending moment, which comes from the wave bending moment and springing bending moment. The Great Lakes offer unique conditions not found in many locations in the world. Due to their smaller size, waves have higher frequency while the vessels are➲longer, meaning that the hull will require more support due to the hydrostatic pressure from more wave crests along the length of the vessel.

When designing ships, it is necessary to find a balance between keeping a stiff hull and a flexible hull. A stiff hull can suffer heavy stress in localized areas and possibly snap like a twig when put in a high stress environment, while an extremely flexible hull will sail like a noodle. When sailing in rougher conditions, ships will spring and shift, and will typically move around nodes, which are points that may exist on the vessel that will not move. During the design process, naval architects will calculate the bending moment of the vessel, the amount of time it takes for it to bend out of place and back to its original form. The longer the vessel, the longer the bending moment will be. The vessel design must undergo tests to make sure certain stresses are kept to a manageable level. Stress is typically most extreme in the midship section as well as the extreme exterior points of a section modulus, normally around the top points of the hull and far sides. They must also take into account the tensile and yield strength of the building construction materials. The section modulus is tested and designed so that no member will reach the maximum yield strength, the point in which it will not return to its original shape, and the tensile strength, the point at which the material will break. All of these components go through the Finite Element Analysis (FEA) test, which computes the stress on each element for the model of the design.

Nowadays, ships are longitudinally-framed, which provides more strength while helping to reduce weight, and in turn, allow for increased cargo capacity. When ships are lengthened, hull girder strength tests on the vessel may find it deficient, as the➲

Transverse reinforcement beams add rigidity to the hull of the *Mark W. Barker*. Photo: Interlake Steamship

Visible in this photo is the reinforced pads on the barge *St. Marys Challenger*. The pads on the tugboat brace against the pads on the barge to help hold the tug in place in the Bludworth notch. Photo: Brendan Falkowski

➲ship was originally designed to be much shorter than its lengthened form. As a solution, longitudinal strapping is welded to the spar deck, and sometimes to the bottom of the hull as well. The strapping thickness will taper off towards the ends of the vessel, as the vessel requires the most strength at the midbody. Hull girder sections are usually stronger on the bottom of the hull than on the deck, which is why strapping is usually required on the spar deck after lengthenings. Since there are cargo hatches on the spar deck, the vessel's neutral axis is moved closer to the bottom of the hull.

While most of the framing is longitudinal, designers also must keep transverse strength in mind to protect against torsion. Transverse bulkheads or reinforcements to help give the vessel more transverse rigidity. Ships designed with fewer bulkheads may go through more torsional analysis on the computer to test the plans. Interlake Steamship Co.'s *Mark W. barker*, which is currently under construction, is a perfect example. The ship is designed with only two cargo compartments, with only one transverse bulkhead in the cargo hold. In order to strengthen the vessel, other transverse reinforcements are designed in place of bulkheads.

Another challenge posed to naval architects is designing a sturdy vessel while keeping weight to a minimum. Again, it is important to find a balance between the two by meeting requirements but not going overboard with too much. Extra steel is deadweight and takes away from cargo capacity. Great Lakes ships will usually have thicker plating around the bow and hull side areas for protection during ice operations. Steel strength and grade is dictated by the thickness and location on the vessel. High strength steel is lighter and stronger, but more expensive. Ultimately, construction materials will come down to owner preference.

In the case of articulated tug-barges (ATB), the tug and the barge are treated separately as far as class design goes. Barges will be constructed similarly to normal vessels, while tugs will have little to no bending moment due to their shorter length. Both will have a strengthened structure and heavier plating ➲ around the connection point, which takes heavy stress. Connector loads are based off of computer model tests and extrapolated according to different sizes. Several components come into play in this step, such as sea state and the thrust/power of the tug. There are many forces acting on the rudder of the tugboat and the connection point of the ATB.

Advancements in Design

Over time, designs have changed as we continue to learn more about ship design. Construction materials and techniques have changed over time. During the 1950's, more was learned about pre-WWII era steel. Through the late 1940's, several T2 tankers broke up off of the East Coast, followed by cracking issues on the hulls of other T2 tankers and Liberty ships. As a result of these incidents, we have learned more about the temperature properties of this "brittle steel". Better higher strength steel has since been developed and used in the construction of new ships. From the development of the steel-hulled freighter through the 1950's, most Great Lakes ships were constructed of riveted and plated hulls with close framing. Ships were also transversely-framed up until the invention of longitudinal framing in the early 1900's. Transversely-framed vessels had thicker plating on the exterior hull, and was not ideal on larger ships due to the fact that they acted similar to a slinky. With the introduction of the longitudinally-framed ship, framing is able to be spaced further apart, and ships are lighter and have increased cargo capacity.

Hull strength is a critical component in designing new ships, and covers a wide range of elements of the design. As technology and our knowledge continue to advance, so do these designs. Ships will continue to be stronger, lighter, and more efficient. ◘

Special thanks to the naval architects who provided their time and resources to help me write this article. Thank you to Travis Martin, Fred Koller, and Nicholas Posh from Bay Engineering, Eric Helder from Interlake Steamship Company, and Nick Hunter from NETSCo. –Brendan Falkowski

VESSEL OF THE MONTH-#56 FREIGHTERS MARCH-APRIL 2021

CSL TADOUSSAC

CSL Tadoussac, St. Clair River, May 24, 2019. Photo by Logan Vasicek

Canadian Shipbuilding & Engineering LTD's Hull #192 was laid down on June 24, 1968, at their Collingwood Shipyards Division in Collingwood, ON. Hull #192, later known as Canada Steamship Lines' *Tadoussac {2}*, was designed as a self-unloading bulk carrier. She would be the last CSL vessel built with a forward pilothouse, and the first constructed with stern-mounted unloading gear. She was originally 730'03'' long, 75' wide, and 41'11'' deep, with a capacity of 29,700 tons at her mid-summer draft of 29'06''. She is powered by a single Sulzer 6RND76 diesel engine, producing 9600 BHP and giving her a rated service speed of 17 mph. Her cargo hold was subdivided into 5 compartments, fed by 23 hatches on her spar deck. A triple hold unloading belt arrangement fed an aft incline belt system to her 249'04'' deck-mounted boom.

Tadoussac was launched on May 29, 1969, and went down the ways 15 minutes prematurely. Sadly, the launch killed two shipyard works and injured another 35. At the time, workers were pounding in launch wedges when she began to slide into the launch well. The cause of the accident was blamed on rotten support timbers. *Tadoussac* set off on her maiden voyage on October 2, 1969, bound for Fort William, ON, to load iron ore.

Tadoussac was the first downbound vessel through the Welland Canal for the 1972 season, and opened the Port of Hamilton, ON, on April 4, 1972. Just over a year later, on April 25, 1973, her self-unloading boom collapsed while unloading at Sandusky, OH. In 1976, ownership of the *Tadoussac* was transferred to Power Corp. of Canada, then the parent organization that owned Canada Steamship Lines, who continued to manage the vessel. Ownership was returned to CSL Group in 1988.

On November 10, 1990, the 15th Anniversary of the loss of the *Edmund Fitzgerald*, the *Tadoussac* found herself in an interesting situation. She lost power in a storm on Lake Superior, while sailing through the same general area that the ill-fated *Fitzgerald* was lost.

During the 1980's and 1990's, Canada Steamship Lines experimented with topping off large ocean vessels in the Gulf of St. Lawrence by unloading their Seaway-size Lakers directly into the holds of the ocean ship. *Tadoussac* was an active participant of this program. ➲

Tadoussac, Sault Ste. Marie, MI, 1972. Roger LeLievre

Tadoussac, Toledo, OH, August 1987. Jim Hoffman

CSL Tadoussac, unloading at Essexville, MI, April 2002. Roger LeLievre

CSL Tadoussac docked at Port Colborne, ON, May 2019. Photo by Isaac Pennock

➲In the late 1990's and into 2000, Canada Steamship Lines was awarded several ore and cement clinker hauling contracts, leading company officials to give the green light to upgrade and modernize the *Tadoussac*. CSL contracted Port Weller Dry Docks of St. Catharines, ON, to perform the midlife refit and reconstruction on the *Tadoussac*. She was laid up at Port Weller Dry Docks on December 15, 2000, and placed into the drydock in preparation for beginning work on the $20 Million project. With the recently-awarded clinker contracts, CSL chose to carry out some more "customized" modifications on the *Tadoussac* for this trade. After being placed in the graving dock, her old side tanks were cut out along the length of the cargo hold, and new side tanks were installed, adding 1'06'' to each side of the vessel, bringing her new overall width to 77'11''. Her cargo holds and self-unloading equipment was reconfigured with new side hoppers, and remotely operated unloading gates. A state-of-the-art dust suppression system was also installed for handling clinker cargoes. To finish off the job, a fresh coat of grey hull paint was applied to symbolize her new commitment to the cement clinker trade. She was rechristened *CSL Tadoussac* on March 3, 2001, in a joint ceremony with her fleetmate *CSL Laurentien*, which was also rebuilt over the winter.

CSL Tadoussac was floated from the drydock on June 13, 2001, and returned to service on June 20, sailing to Bowmanville, ON, to load cement clinker for Detroit, MI. While unloading clinker at the Essroc dock at Essexville, MI, on September 5, 2005, *CSL Tadoussac* suffered yet another boom collapse. Nobody was injured in the accident.

On March 20, 2007, *CSL Tadoussac* had the honor of opening the Welland Canal on the 75th Anniversary of the opening of the 4th Welland Canal in 1932. As a result of lower economic demand, *CSL Tadoussac* was laid up at Thunder Bay, ON, on January 17, 2015. Many believed that her sailing days were over. After winning a new ore hauling contract, Canada Steamship Lines had *CSL Tadoussac* towed to Heddle Marine's Thunder Bay shipyard on December 14, 2017, for a refit prior to returning to service. She departed Thunder Bay on April 7, 2018.

CSL Tadoussac continues to be an active member of the Canada Steamship Lines fleet, primarily serving the ore and cement clinker trades.□

CSL Tadoussac, St. Marys River, September 25, 2006. Roger LeLievre

CSL Tadoussac, Rouge River, June 23, 2019. Isaac Pennock

CSL Tadoussac, Sault Ste. Marie, MI, Summer 2019. Daniel Lindner

CSL Tadoussac, St. Marys River, Summer 2019. Sam Hankinson

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Brendan Falkowski

Is a Great Lakes ship enthusiast who shares his passion for the freighters through his newsletter and his artwork. He is currently pursuing his high school education in mid-Michigan before graduating and moving on to college, where he plans to attend to the University of Michigan to study Naval Architecture and Mechanical Engineering. Brendan is an avid musician, and is a drum major in his high school marching band. He enjoys sailing and spending time with his friends and family.

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Cover Photo: *American Courage* arriving at Bay City, MI, July 26, 2020. Photo: Logan Vasicek

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