



Up the Hawse Pipe
Bruce Liberty:
A Brief History of a Ship's Engineer

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by Sheila Packa

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Not many people know what life is like on the freighters on the Great Lakes. This is a short history of one mariner, Bruce Liberty, a fleet chiefengineer, whose life spans much of the history of Great Lakes ore (and other bulk cargo) carriers, from hand fired steam to modern steam turbine and diesel, including the present day 1000 footers. In northeast Minnesota laker history, he is one of the many proud "hawsepipers" who started at the bottom and climbed the ladder to leadership positions. Unlike seamen who stepped from academy courses into a licensed position up the chain, hawsepipers learned the business from the ground up, on the job. Hawsepipers have the advantage of gleaning the wisdom of senior seamen as they gain first hand experience in the trade as the technology and industry changes. Hawsepipers are a tightly knit group of mostly seasoned sailors that operate the transportation pipeline on the Great Lakes. The boats they work on are monuments of naval architecture, mechanical engineering and navigation.

As an engineer, Bruce Liberty oversaw, contributed to the design, installation and maintenance of the mechanical and electrical systems for many of these lakers, especially in the US Steel fleet. Many of the boats seen on the lake today have been in operation for sixty years; he kept the massive engines in his fleet operating at peak performance.

The shipping lanes are routine, except for other

traffic and weather. Bruce was never concerned about his ship sinking. Lakers, made so the waves break over the deck, are different than salt water vessels designed to dive and rise with waves. From the pilot house during a storm, he was reassured by the sight of the steel frame of the boat flexing; this helped it ride the heavy seas. In earlier days, before the steel beams were welded, he could hear the rivets of the beam whiz through the air. As for the toll on the boat, replacing the 10,000 rivets in dry dock was just part of his job.

His parents were married on the steam ship, A. D. MacBeth, and together they "kept ship," meaning that his father was the chief engineer and his mother, the cook. The A.D. MacBeth was built in 1897, was 375 feet long, and had a three cylinder (triple expansion) steam engine that ran at 1150 horsepower. Bruce was 6 months old when his parents brought him aboard a ship for its christening; he grew up sailing with his dad on the lakers. He shipped out on his own in high school, and after 41 years of service, retired as Senior Mechanical Engineer of the US Steel Fleet in 1992. I interviewed him at his home in east Duluth. He was suffering from mesothelioma, a lung cancer that stems from exposure to asbestos. Photos of the boats are posted on his fridge next to those of family members. He has photo albums of freighters and a library of Great Lakes shipping and engineering books. His and his father Edward's careers on the freighters nearly span the history of the shipping industry.

A Steamship: The Harry William Hosford

Edward Ross Liberty, Bruce's father, began working on the boats in 1913 and eventually became a chief engineer. At first, he worked for the company owned by the Hutchinson family. In the trade, they were given the nickname, Hungry Hutch, because they were known to

feed the crew well. He saw the fleet split into two, the Pioneer Steamship Company and the Buckeye Steamship Company. Edward then worked for the Buckeye Steamship Company. These ships were red with red cabins and black smoke stacks. Many of its ships were purchased when other companies went bankrupt, like the Harry William Hosford. This steamship, built in 1903, was 512 feet long with a triple expansion steam engine that ran at 2000 horsepower. This boat, formerly one of the FB Squires of Jenkins fleet, was very flexible. It had five different cargo hold compartments instead of the usual three. This enabled the company to carry five different products or to haul freight for five different customers. It had smaller tonnage, which was better for customers without the cash resources needed for the larger shipments. It never did "lay up" in the winter during the depression years. In about 1928, Bruce's father started working on the Hosford and he became the chief engineer.

During the Depression and later, during the war years, the captain and chief engineer were asked to sail the ship with no fixed pay until the company delivered the cargo. Then, all the crew men would be paid first, as required by federal law. The captain and engineer might get paid, or they might be given a share in the company, thereby allowing the company to survive economic hard times.

Boats were different back then, as were the practices of the shipping industry. The steam ships were fueled by coal that was shoveled into the boilers by hand. The earlier tow ships were equipped with a propulsion plant, often had quadruple expansion engines (4 cylinders) and could tow behind 2 barges (that looked just like the steamer but with no engine). When it arrived at the destination, the ship dropped off one barge to be towed into port by tugboats and went on to the next port. It was an efficient way to haul a lot of tons. However, these ships

slowed traffic in the Soo Locks, and eventually the US Coast Guard and the Corps of Engineers forced a change. The barges were scrapped out and in order to increase the fuel efficiency, the tow ships' cylinders were "bushed down" to cut down the horsepower and save fuel. Bruce's father was in charge of this; Bruce worked right alongside the crew on the massive engines with their exposed rotating crankshaft and piston rods.

It was common in summer months for a family to come on board. Bruce's mother acted as cook, his sister Carol as 2nd cook or baker. When she preferred to be on deck to look at the sights, Carol was designated a wheelman. Bruce, fascinated by machinery, helped out in the engine room. During the war, when the boat was run shorthanded because there was nobody to ship out, the family supplemented the crew.

Communication was different back then, before radio. In the 1940s, the Harry William Hosford hauled grain. After the ship loaded its cargo, it would depart and pass through the Soo Locks where the captain would receive orders for his destination—from the post office or telegraph. The captain would also learn what other vessels were destined to arrive at the same dock. In Detroit, a mail boat from JW Westcott Company would bring a second message with orders. The war effort was on; tonnage was needed, and sometimes safety was lax. Discharging the cargo took a week. If the captain and chief engineer could arrive at port ahead of the competitor, it would be a great financial advantage.

Near Buffalo, New York, Bruce remembers when his father's boat raced ahead of the others in order to get to the loading dock in the port first. With the ship's lights out, so as not to be detected at night, Edward raised the steam pressure in response to the captain's call. He looked through the pipes at the boat they were going by as the horsepower increased and the vessel's speed increased

another 1 or 2 mph. Often, the crew of the other boat wouldn't even know what happened.

Boats came off the line in winter. The shipping season ended in December and the companies put their ships into port. Bruce's dad and many engineers would be the 'winter gang' that overhauled the engines and cleaned the boilers. His mother got permission from the school to release Bruce from class to work with his dad. Near the Christmas holiday, his father sent the crew home to be with their families. He knew they appreciated the time off, and the company was happy because they didn't have to pay all those workers. Bruce and his dad would finish the job on their own.

Times on shore were different too. Bruce bought his first car when he was in the eighth grade; the family home was in Toledo, Ohio. Because his father did not drive, he would taxi him to and from the ship. A family friend, Mr. Sebert, owned a shop and converted standard automobiles into ambulances or hearses that were sold across the country. Bruce and Mr. Sebert's son Fred, who was the same age as Bruce, 14, were assigned to deliver an ambulance to Monterey, Mexico. Bruce said they did the job responsibly. In the ninth grade, Bruce helped out at the Cherry Grove Dairy where he and his school age friend gained a lot of experience working on the milk trucks. Soon, the owner suggested they buy a bailing machine. They did so, and charged 11 cents a bail; within a year, they paid off the bailer. In 1949, they bought a Ford truck (and paid cash for it) and used it to haul sugar beets for the farm after school. And later, during a coal strike, they bootlegged coal, as the owner of the dairy also owned a coal yard. The highway patrol would escort the boys in and out of the coal yard, but on the road, they were on their own and knowing they were in danger, they would speed back to the Dairy.

It was no surprise that with his level of experience

at the age of 14, Bruce decided that he would sail on the lakes and get a nest egg. He switched to a McCumber Vocational School where students were sent into the industry, alternating weeks at school with weeks in a machine shop. He knew that learning how to make parts would be a useful skill. He earned a high school diploma in machine shop in 1950. The summer before he graduated, he shipped out on the Charles L Hutchinson, a Pioneer Steamship Company bulk carrier that hauled iron ore, steel, and limestone. This boat, built in 1910, was 580 feet long and had a triple expansion engine that ran at 2000 hp. Bruce came back to finish school and then shipped out again. It was the beginning of his life-long career on the ships.

Bulk Carriers: Enders M. Vorhees and the William A. Irvin

Right after high school, on his first ship, Bruce was able to move from coal passer to fireman to oiler. The firemen (usually there were two) shoveled coal from the bunker into the fire. His record was two tons per hour. The coal passer assisted. Every four hours, they pulled the fire out to clean the fire box. The coal passer would pull the ashes out and shoot them out into the lake. The work was hard manual labor, and it was hot. "You'd have thought you were in hell," Bruce admits. The oiler was the man oiling the big reciprocating engine (typically 1400-1800 horsepower) with open bearings and connecting rods and a rotating crankshaft. It required skill and mindfulness. Bruce remembers the exact dimensions of the pistons and rods.

Following advice from his coworkers, Bruce transferred to the US Steel fleet on August 1, 1951. US Steel had their own fleet of boats as well as the mines and steel companies. The independent fleets were haulers only;

their role did not seem as secure. Bruce shipped out on the Henry H. Rogers as an oiler and he sailed on the Rogers until the end of the season. When the winter season brought extreme cold weather that froze the cargo on the docks and in the cargo holds, U. S. Steel assigned him to another ship in Lorain, Ohio, the Enders M. Voorhees. The Vorhees had the new steam turbines. He signed on the "article sheet," a seaman's document that identified who you are, that you were a citizen of the United States, and that you wouldn't jump ship in the middle of a voyage. He sailed on her until she came off the line. By that time, Bruce had enough sea time to write the license as a 3rd assistant engineering officer. The chief engineer on the Voorhees was Albert Rhodes, "Daddy Rhodes," a 50 year employee who shipped Bruce's dad off the dock as a kid in 1913.

Once, the ship suffered a blackout and the "black gang" (named for the black coal dust that covered the men) rushed to the engine room to find Albert Rhodes sweeping the floor. They looked askance at the chief engineer. "I'm staying out of your way," he told Bruce and the other men and he had them locate and repair the problem. Bruce already seemed to have a mechanical genius; he appreciated that his superiors gave him the privilege and opportunity to troubleshoot and address these challenging repairs.

Every day brought interesting work, and occasionally, adventure. On May 11, 1953, the Enders M. Voorhees was called to rescue another ship. Out on the lake, south of Isle Royale, a distress signal came from the Henry Steinbrenner; the boat's hatch covers had come off, and it was sinking. Because of the heavy seas, the crew of the Vorhees was ordered to batten down everything before the ship could tum around; the crew worked hard and quickly to accomplish this.

When the ship made the tum, the waves made the

ship lean so far over that the life boats, suspended high on the pilot house, touched the water. Because of the tilt, the bricks lining the boiler fell into its fire pit. The fires went down and the ship lost power. In the middle of a heavy storm, the Vorhees and its crew were in danger. Al Rhodes dressed the crew in overalls and coveralls, doused them with a fire hose, and then one at a time, put a man on a plank into the fire area to haul out the bricks. After six to eight minutes, with wet clothes steaming and the plank singed, the man would be pulled out and put on the floor while another man went in. Working in this way, the men were able to clear the fire pit and get the fires back on. But by that time, another ship intervened and rescued 14 of the 31 crew members before the Steinbrenner sank.

Bruce knew engines inside and out. It was common for him to slide inside an engine in order to assess a situation. He continued to climb the ladder of responsibility and went from the Voorhees to the John W. Gates as 2nd assistant engineer. The fleets' policy was to move engineers from small to large boats, through the classes, to give each officer sufficient hours to qualify for the licensing exams. Bruce worked on the William A. Irvin as 2nd assistant engineer. Now a popular tourist destination in Canal Park, the Irvin then was a flagship ore boat that carried corporate passengers. The crew was hand-picked. The cabins were paneled with fine wood, with fireplaces and brass hand rails. The boiler room was painted with a coat of aluminum paint once a month to keep it spotless.

Like other ships, a rivalry existed between the deck and engine room crew. Bruce believes it stemmed from the sailing ships and also the separation of the two trades. One trade worked on deck with sunshine and scenery (or cold weather and fog), and they had the navigational expertise to travel safely. Each deck officer is a pilot trained and qualified by the Coast Guard. In order to pass the licensing exams, the employee must know each

port, plus all the charts, lights, buoys and what they mean besides have the skill to navigate the ship in any weather and in ships' traffic. The engineers were responsible for the propulsion of the ship and for the power generation, plus the lighting, services, and heating. The two trades' cabins were on opposite ends of the ship. The captain's dining room usually had the deck officers on one side of the table, and the licensed engineers on the other side. Sometimes the rivalry was humorous. He said there was always one person in charge, the captain, or "skipper," and the vessel operated under his command. The chief engineer also served the skipper.

With all his experience, Bruce's skills earned him a license to operate any type of diesel or steam engine ship on any waters in the world.

the U.S. Steel Fleet

Then in 1956, three years after his father retired from the Hosford, Edward was diagnosed with cancer; his mother had had multiple sclerosis for a long time. Bruce was needed at home. He reluctantly handed a letter of resignation to his supervisors and went to help his parents.

Three months later, US Steel called and asked Bruce to come back. His father encouraged him to go. "Show good faith to your company," he said. Bruce was reinstated on the Ralph H Watson. When the company sent the head engineer from the office to the ship to ask Bruce if he'd be interested in coming ashore as fleet engineer, he said yes. He came ashore in the fall of 1956 in Cleveland, Ohio to join the staff that was responsible for the design and functioning of all the ships in the US Steel fleet. At that time, 58 boats. Eventually, US Steel moved its shore side engineering office from Cleveland, Ohio to Duluth, Minnesota. Bruce and his wife bought a beautiful house on the east side of Duluth.

The Duluth Port Authority's Jim Sharrow, who once worked with Bruce, said: "Bruce's approach was not merely to fix what was broken but to improve upon the original design and make it work better than it ever had." Ralph Bertz, his friend and former boss, acknowledges that Bruce had an exceptional mechanical genius and that he was self taught. He was knowledgeable about converting boats from steam to oil. He generously used his skills for others. "He was always gung ho," Ralph said.

Bruce said unfortunately being ashore didn't mean spending more time with his wife and three children. "I spent 280 days a year chasing the boats around the lakes." He could drain and lay up the ship, move the fuel around, or pump out the ballast tanks (a vessel used 75000 gallons of fuel for ballast). Whenever a boat had damage or needed work (this is called a casualty), he was there to make sure the work was done. He would eventually oversee the installation of all machinery, specifications, and installation on the new ships that were built, the Roger Blough (built 1972, 858 feet), the Edwin H Gott (built in 1979, 1004 feet), and Edgar B. Speer (built in 1980, 1004 feet).

Bruce was at the forefront of all the major changes in technology in his career along with a cadre of shore side personnel. The ships in his father's day were using hand fired coal. Next, the boats were adapted to a stoker fired coal boilers that were automated. Crew still had to clean the fire pit and pull the ashes every four hours. Then the industry made the transition to oil fired burners on the Arthur M. Anderson, the Philip R. Clark, and the Cason J. Callaway (all these boats were built in 1952, and were 767 feet long). He started the process of converting the older reciprocating steam engines to burn on diesel fuel instead of coal. Each change increased the horsepower of the boat and reduced fuel usage. Each change reduced the number of crew needed.

Bruce was an early adopter, encouraging the use heavy oil in the diesel engines. Heavy oil was the least expensive, about the half the cost, but it did pose some challenges. He oversaw the installation of refining equipment (a centrifuge to clean the impurities and a method to heat the fuel in order to improve the viscosity) so the oil was suitable for use in the large engines. The sludge or remainder was used in the boilers for heat and electricity, resulting in a zero discharge. This was a significant contribution to the industry.

In 1978, with his cohort Rick Harkins, Bruce organized the Medium Speed Diesel Engine Owners Association in order to network with other companies to improve the engine, filtration, and lubrication and all phases of medium speed engines. They also evaluated the OEM, or Original Equipment Manufacturer specifications, and were able to work with the manufacturers to improve engine components. At first, their association began as a small group meeting in Duluth but it eventually grew and meetings were held all around the country. The focus was problem-solving and the group made much progress improving the technology and efficiency of the boats. The medium speed engine had a low profile and allowed the company to design the ship in such a way that the conveyor system could travel over the top of the engine, as in the Roger Blough.. They went from 'straight deckers' having to be unloaded, a process that used to take a week to self unloaders with booms on deck that could discharge the cargo in a matter of hours. The company was later able to go to 1000 foot class and have belt technology to raise the cargo to the unloading boom. The fleet that had originally had 58 boats, went down to 38 and then to 11, hauling the same tonnage, traveling and unloading much faster.

Bruce loved his job; it was the perfect fit. With his skills, he was able to make a significant contribution to

the entire industry but most difficult was that his work kept him away from his family for long periods of time. Because of it, he didn't urge his own sons into the shipping business. When two of his children were grown, and the youngest son was still at home, tragedy struck. Bruce's wife Josephine was on her way down Superior Street in Duluth to a quilting meeting with a friend, when a car collided with theirs. Josephine was killed instantly. Bruce was away from home at the time; it was tremendously difficult time for the children and for him.

Bruce missed his wife so much; a year later, he knew he wanted to share his life with someone. He talked to his daughter Vickie, also a quilter, inquiring if there were any women among his wife's quilter friends who might be single. Vickie did know of somebody who had helped her get through the difficult loss of her mother. She planned a dinner at Bruce's home in Duluth, and invited Feme. Feme was an avid quilter, like Bruce's first wife. She had recently lost her husband of many years. When Feme realized that she was being courted, she had some consternation but Bruce soon won her over. He was articulate, capable, strong and charming. They now have been married for 24 years.

Since Bruce retired in 1992, he's been very active in the community, doing the same work he's done all his life, working on machinery and fixing things. He used to visit the lakers in port. Jim Sharrow of the Port Authority said any boat was better for Bruce having been on it, even if he was visiting. He was often asked to help diagnose an engine problem. Recently, he helped with deck crane motor on the William A. Irvin and boiler problem on the Kaye E. Barker (1952, 767 feet).

Bruce is a member of the Harbor Club, an organization of retired employees of the shipping industry and consults with many organizations and individuals regarding boats and engines. He continues to use his skills for

others, and continues to do so despite the lung cancer. He admits to prowling the line at old steam tractor shows with his steam license as documentation to be on hand to help diagnose and repair a balky steam engine. His expertise soon became known!

He asked the members of his wife's quilt guild to make a list of things at home that they needed fixed, and one by one, he took care of the repairs. He's overhauled cars with friends and also the fire and rescue vehicles of The Clifton Volunteer Fire Department. The fire truck they had been using was purchased from the airport, and it was formerly used as a military jet refueler. Bruce explained that because it had been designed to carry fuel to the planes, it was made to travel at slow speeds over flat terrain. On the highway, racing to fires, the engine wasn't able to meet the need. So, he was able to locate another used truck from the power company that had a more suitable engine and chassis to carry the large water tank. He worked on the fire department's ambulance. All short work for a man of his background.

I interviewed Bruce in his sun filled kitchen. As we finished talking, she came up from the quilting studio in the lower level as if from the hold of a ship. He handed her the work lamp that he had just rewired.

"He's got to have something to fix," she told me, as she gave him an affectionate hug. "If he doesn't, then I break something."

Resources:

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