

**Practical Experience of
Log Barging in Canada**

by

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INTRODUCTION

Seaspan International based in Vancouver, British Columbia, operates the largest integrated tug and barge fleet in Canada.

The major segment of our business is dependent on the forest industry, in which our four self-loading/self-dumping log barges play a significant role.

BACKGROUND

Tug and barge transportation has flourished on the west coast of Canada due to the unique features of the coastal geography. First is the inland waterway created in the shelter of Vancouver Island, stretching 350 miles. Second is the range of coastal mountains that eliminates the possibility of north/south rail or road routes for the transportation of cargo by land.

Logging and associated lumber activities began in a small area of the lower south section of British Columbia's coast in the 1880's. From that time, to the early 1920's, logs

were delivered over relatively short distances to sawmills in the form of flat booms. These booms were of simple construction, mainly employing reusable dog gear.

As local logging areas were used and the need to move further away from the established sawmills and shipping ports became necessary, log boom towing was performed within the protection of Vancouver Island in relatively sheltered waters. These booms became more sophisticated, first as flat booms with log side sticks and swifters and then tows of bundled booms with wire swifters. Both methods are currently being used.

With the expansion of the sawmill and the growing pulpmill industry, it finally became necessary to move away from the sheltered waters behind Vancouver Island and move to the harsher waters off the west coast; the Queen Charlotte Islands and the north coast of the mainland.

For a while, towing companies tried to deliver logs by inventing modifications

to traditional rafts, continuing to allow towing logs in the water. These were known as Davis rafts or cribs which were basically a network of logs lashed together and loose logs loaded onto the floating mats. The completed raft was made by lashing the loaded logs to the mat. This method of log boom construction was very labour intensive to assemble and disassemble and required large tugs that moved at very slow progress in only relatively good weather.

BIRTH OF LOG BARGES

Due to the need to move an increasing volume of logs from unprotected waters, it became evident that logs would have to be carried over the water rather than in it.

Up to the end of the second world war, many attempts were made to transport logs in the holds of redundant sailing ship hulls. The old wooden hulls were difficult to stow, caused many problems in transit due to seaworthiness, were impossible to keep on a straight course and did not carry

an economical pay load.

After the second world war with the availability of war surplus barges and the beginning of locally built steel barges, logs were carried as a deck cargo.

These barges were loaded and off loaded by shore cranes, usually stiff leg. These barges were small and could only be utilized at locations where shore cranes were available and as a result, proved again to be a costly form of transportation.

About this time, the idea of flooding one side of the barge to allow the logs to slide off and reduce discharge time was attempted. In fact, the logs did not slide off but the barge moved out from under the cargo when heeled over. The concept of self-dumping log barges was born.

SELF-DUMPING LOG BARGES

By 1954, a number of steel hulls were converted to self-dumping barges and in that year, the first specifically

intended self-dumping barges were built to carry approximately 7,000 short tons.

These two barges were the prototype of all larger size log barges in use today. The typical construction has two longitude water tight bulkheads with two tipping tanks on one side controlled by separate valves. Water is introduced to these areas until an angle has been reached that the logs begin to slide and the barge is forced away from under the cargo. The barge, then empty, either self drains or pumps the ballast from the tanks to allow the empty barge to return to even trim.

Due to the success of these two barges, a number of self-dumping barges were introduced to coastal trade and some are still in service today.

SELF-LOADING/SELF-DUMPING LOG BARGES

The newer deck loaded self-dumping barges proved that logs could be moved economically through bad sea conditions and with a quick turnaround due to the self-dumping technique.

However, as the number of logging camps, many non-permanent, increased in the outlying areas, it proved costly to justify the installation of many shore cranes.

To satisfy the need, a self-dumping barge was fitted with a single pedestal crane in 1958, mounted amid ships on the opposite side of the tipping tanks.

The result was instant success and six more self-loading barges were built between 1961 and 1965. These barges had capacities between 6,000 and 18,500 short tons.

Due to their size, some larger barges were fitted with two cranes to allow the necessary reach to load the barges to capacity.

RE-ASSESSMENT PERIOD

This may be a good time to stop and reflect on what seems to be a success story, in fact it was far from it.

The barges were loaded to ensure maximum cargo but were under-

designed leading to deck and hull failures. Cranes were mounted on deck stepped pintles with roller bearing cabs, which suffered damage from heavy weather shock loads and vibration during transit. Discharges that occurred too quickly resulted from improper introduction of ballast in relation to load height. This caused cranes, booms and hulls to suffer excessive damage from extreme forces, not understood at that time.

As a result, barges and cranes had to be redesigned and upgraded structurally. Load sizes were reconfigured and constructed to allow safe discharge. All logs are now stowed thwartship in single tiers or double tiers on larger barges.

Each load is now specifically calculated to height and width, depending on the species and weight of each cargo to allow the barge stability for the transit, as well as ensuring a safe dump when water ballast is introduced at the discharge site.

A barge should safely dump between 40 to 50 minutes after commencement

of ballasting.

HEAVY LIFT SELF-LOADING/SELF-DUMPING LOG BARGES

With the knowledge gained from the original self-loading/self-dumping barges and a new demand to transport larger bundles of logs from the camps to the marketplace, the current phase of log barges began, and in 1976, four specifically redesigned barges were commissioned with cranes capable of lifting 50 ton bundles. Under normal circumstances, these barges can load the cargo between eight and ten hours.

The current fleet of self-loading/self-dumping barges is twelve ranging from 8,500 to 18,500 tons capacity with either a 20 or 50 ton lifting capacity.

ANNUAL CAPACITY

The total log barge fleet is projected to transport approximately 10 million short tons of logs annually. On average, each barge will complete between 65 to 70 trips of approximately four to five days duration. When hauling out of

south east Alaska or into the Columbia River, average trips are seven to eight days.

Our longest trip to date was lifting 18,500 tons of logs from Icy Bay Alaska to Gold River, British Columbia towing over 4,000 miles in 22 days.

SUMMARY

Although log barging is not a strict science, a great deal has been learned over the course of events and today's barges are designed for suitability to the trade, performance and dependability.

In this regard, tugs and crews are dedicated to the service to allow utmost familiarity with customer facilities and needs. Barge loaders are highly skilled in loading procedures and log characteristics, as well as being capable of barge maintenance, as customers demand both on-time service and extreme care of cargo under a demanding schedule.

To compete successfully in the log

barging trade is a long-term decision based on high utilization due to the large capital outlay to initially construct a capable carrier and a continuing regular outlay of capital to ensure the ongoing maintenance of the barge.

LOOKING AHEAD TO "2000"

The log barging industry on our coast has come a long way from its humble and inefficient beginnings some fifty years ago. I feel confident that with the wealth of local knowledge and continuing advancement of technology, we can continue to upgrade and economize this unique form of marine transport. However, the key to our future success lies in the hands of the forest industry, governments and unions to show wisdom in working together to provide an ongoing stable forest resource.