

LST TEST FACILITY



Vintage Reminder of Efforts Expended in World War II to Create a Viable Amphibious Ship Design

BACKGROUND

Painful lessons were learned during the evacuation of over 300,000 troops from the beaches of Northern France in May of 1940. Shallow water and the lack of any port facilities in the village of Dunkirk forced the British to use hundreds of small watercraft to extract personnel. But their military equipment of any size had to be left behind.



Any Allied attempt to invade Europe later in the war would require a large number of amphibious ships. Such vessels would need to be capable of carrying huge quantities of men and material, be seaworthy and be capable of running onto beaches or at least very close to shore in shallow waters.

In August of 1941, British Prime Minister Winston Churchill and American President Franklin D. Roosevelt agreed that the design and construction of such vessels should be accomplished in the United States.

"Let there be built great ships which can cast upon a beach, in any weather, large numbers of the heaviest tanks." ~ Winston Churchill, 1940

DESIGNING A LANDING SHIP, TANK (LST)

The task of designing such an amphibious ship was assigned to John Niedermair [right] of the US Navy's Bureau of Ships. His basic design, with some refinements, as described later in this article, was utilized during World War II to create over one thousand vessels that were officially designated as Landing Ship, Tanks (LST's).



Each one of these ships was 328 feet long with a beam of 50 feet. An over-sized ballasting system enabled their tanks to be filled with sea water, resulting in a draft of 14 feet, making them suitable for self-sustained ocean transit. When approaching a beachhead, these tanks could be pumped dry, allowing a LST to reduce its draft to just three feet, nine inches.



'Clam shell' doors and a ramp were fitted to their bows. Machinery and crew spaces were mostly located aft, allowing for as many as 27, twenty-five ton tanks to be carried internally.

Some of the first LST's were built at Newport News Shipbuilding (NNS). Their need was so great that the keel of an aircraft carrier was pulled out of Shipway #11 in late 1942 to allow for six LST's at a time to be built there.

As ingenious and practical as this design was, it included two problems for the military. The Army's tanks had to be carefully backed up the ramp and into the vessel; not an easy task for a tank driver who only could face forward. Then there was the more serious issue of tank engine exhaust.

Preliminary tests at the Army's Aberdeen Proving Ground indicated that the amount of toxic exhaust generated by just one tank in a confined space was staggering. Twenty seven tanks' engines, all warming up at the same time inside an LST would be lethal.

To help solve this problem, construction of a full-scale mock-up of a LST 'tank deck' was ordered by the War Department. Fort Knox, Kentucky, home of the US Army's Armored Force was selected as a suitable site to build such a facility.

BUILDING & EVALUATING THE LST TEST FACILITY

Using blueprints developed for ship construction, the Post Engineers at Fort Knox started constructing what became informally known as the 'LST Building' in April of 1942. Two months later, the structure... depicted on the right during practice to back a tank into its interior...had been completed.



What was also called the 'Fort Knox Ark' featured internal structural features similar to those to later be installed in real LST's. But these duplications were made entirely of wood.



After a few tanks had been parked inside the LST Building, large flexible ducts were attached to each tank's engine exhaust in order to disperse their noxious fumes to the atmosphere, as shown on the left.

On a signal from a control and monitoring station built immediately adjacent to the mock-up structure, tanks started up and moved forward, one by one. They passed in single file through the faux bow doors (shown in their closed position from the interior of the mock-up, right) and down a simulated ramp.

Numerous problems were encountered with this procedure. The ventilation ductwork leaked badly and was easily damaged. Tank drivers were forced to wear gas masks while in the building, which greatly hindered their visibility for maneuvering in close quarters.



When the tanks moved forward, the ducting connected to their engine exhausts often did not disconnect as hoped, requiring the ducts to be repaired before reuse. In addition, after some of the tanks had exited the mock-up, dangling exhaust lines remained, interfering with the remaining tanks' movements.



Bureau of Ships observers decided that a better design was needed. The ultimate fix was to install several huge fans in the overhead of the tank deck of all LST's. These fans discharged directly to the atmosphere, keeping the enclosed area reasonably clear of noxious fumes. After this concept was tried in the 'Fort Knox Ark' and found acceptable, all testing there ended in August of 1942.

POST-WORLD WAR II USAGE



After lying dormant for about three years, the all wooden structure was converted into classrooms. Windows and doors were cut into the sides of the structure. Heating and fire protection systems, and restrooms were installed. For three decades the US Army's Armor School used the building for educational purposes.

Emptied out and abandoned again by 1980, the structure deteriorated badly until some years later the Army elected to use it for storage of antique armored vehicles until additional display space at the nearby General George Patton Museum could be provided. The Army's original plan, once that transpired, was to tear the venerable wooden structure down. Accordingly, for a number of more years, little was done to maintain the LST Building.

World War II veterans, including a number of US Army 'tankers' and US Navy LST sailors vehemently objected. The Army relented, and arranged for some maintenance work to be done.

A patriotic local contractor doing other roofing work on the military base donated material and labor to install a new roof on the LST Test Facility a few years ago. What its interior currently looks like, still housing several old tanks destined someday for museum display, is shown on the right.



In 1998, it was determined that the LST Building could possibly be listed on the National Register of Historic Places. That recognition has yet to take place, perhaps because of the structure's uniqueness. Since it was built to ship plans, it didn't neatly fit in the National Register's standard categories.

But because it is a one-of-a-kind entity and of World War II significance, a small but determined cadre of preservationists hopes to not only get it listed...but restored as much as possible to its original configuration. That will require donations of a lot of money and volunteer labor...plus Army cooperation.

In all likelihood, the LST Building will eventually be demolished, perhaps sooner rather than later, as have almost all of the hundreds of LST's whose amphibious missions benefited from the tests run in the 'Fort Knox Ark'. Such is often the fate of test facilities and mock-ups, once they have fulfilled their original purpose.

FOOTNOTE

While the LST Test Facility may not survive much longer, one of the vessels whose design was improved by the 1942 testing is likely to be around for a long time. LST 393, restored to its World War II configuration, serves as a floating museum in Michigan. Built by NNS in 1942, public access to her tank deck is provided via her permanently gaping clam shell doors and lowered ramp.



Bill Lee

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