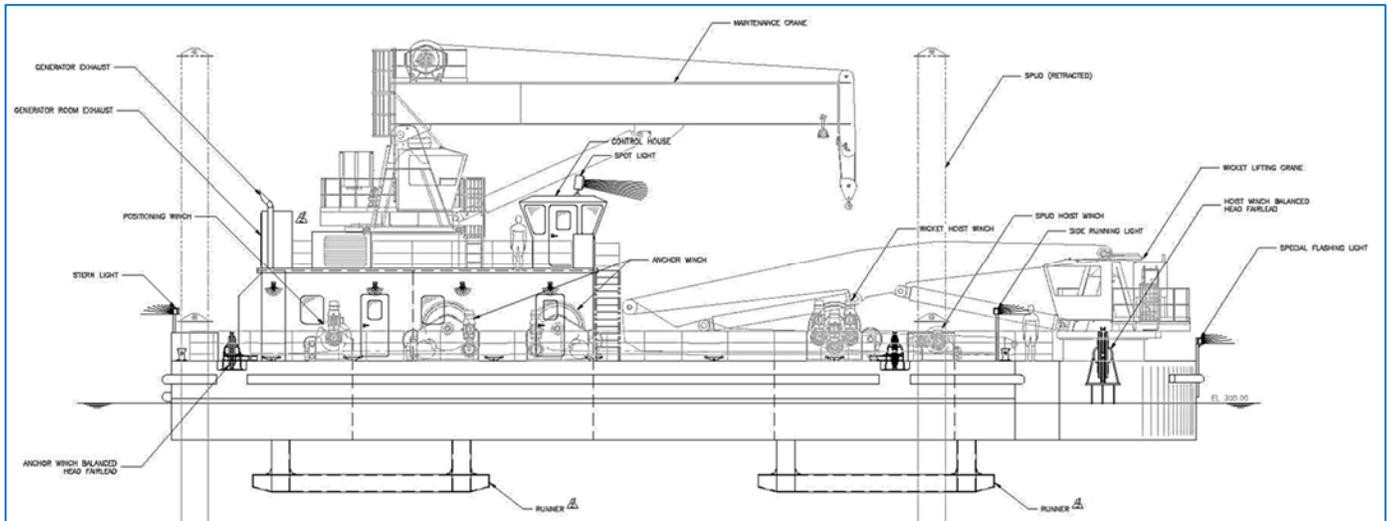




Power Dynamics Innovations LLC To Design and Manufacture Wicket Lifter Barge Winches and Winch Controls

March 2017 – Stennis Space Center, MS,

Power Dynamics Innovations LLC has been awarded a contract by Conrad Shipyard, Morgan City, LA, for the design and construction of Winches and Winch Controls for the U.S. Army Corps of Engineers “Wicket Lifter Barge” which will be used to raise and lower steel dam wickets and perform maintenance functions at the Olmsted Locks and Dam on the Ohio River.



Conrad Shipyard was awarded the contract by the U.S. Army Corps of Engineers for the construction of the barge. "Conrad Shipyard has a long history of building vessels for the Army Corps of Engineers," said President and CEO Johnny Conrad. "This award is a testament to the extraordinary level of quality and craftsmanship that Conrad consistently delivers." When raised, wickets block water and feed it to adjacent boat locks that safely harbor barges to a lower elevation when the river is low.

The Olmsted Locks and Dam Project is the largest and most expensive inland water navigation installation ever built in the United States. More than ninety million tons of material are shipped through the locks annually. PDI, Power Dynamics Innovations LLC will design and provide the Anchor Winches, Positioning Winches, Wicket Hoist Winch and Spud Winches along with Winch Control Stations and Winch Variable Frequency Drives.



Carl Liberty, PDI Managing Member says, “We are extremely thrilled that we have been selected as a supply partner to Conrad for this contract. Conrad’s founding principles of Quality, Craftsmanship, Integrity and Service have served them well over their rich 70-year history and we look forward to a long and mutually beneficial relationship with them in the future.” Liberty adds, “PDI has thirty years of providing successful, cost effective custom designed equipment and fluid power solutions. We thank Conrad Shipyard for this opportunity to supply our Dynamic Power™ Winches and Controls.” Power Dynamics Innovations LLC is known as a leader in the industry, engineering custom winches, hydraulic power units and pipeline tensioning equipment.

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Significance of the Project

Of the 25,000 miles of inland, intra-coastal and coastal waterways in the United States, approximately 12,000 miles constitute the commercially active inland and intra-coastal waterway system all maintained by the Army Corps of Engineers. This network includes nearly 11,000 miles of the “fuel-taxed inland waterway system.”

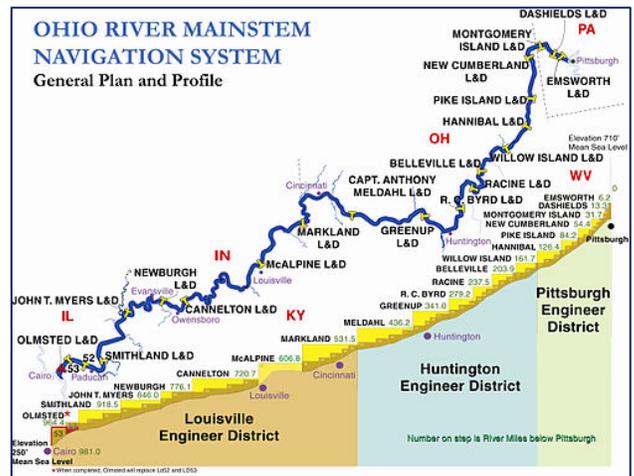
The principal value of the inland waterways is the ability to efficiently convey large volumes of bulk commodities moving long distances. The shippers and consumers all depend on the inland waterways to move about 630 million tons of cargo valued at over \$73 billion annually which is about 17 percent of all Inter-city freight by volume. These are raw materials or primary manufactured products that are typically stored for further processing or consumption, or transhipped for overseas markets.

If the cargo transported on the inland waterways each year had to be moved by another mode, it would take an additional 6.3 million rail cars or 25.2 million trucks to carry that load. Imagine adding this traffic with the associated air pollution to the already congested rail lines and highways that pass through our communities. Carbon Dioxide emission from water transportation are millions of metric tons less than if other transportation modes would have been used.

While annual capital spending for the inland waterway system has averaged about \$170 million in recent years, the income stream from the systems “fuel tax revenues” can support an annual capital investment program of about \$250 million without reducing the surplus in the Inland Waterways Trust Fund, a system that is paying for itself.

The Ohio River flows 981 mi from Pittsburg Penn. where the Alleghany and Monongahela Rivers join together forming the Ohio River, to the Mississippi River near Cairo, Ill. This waterway is key to the local and state economic development and job creation. The Ohio River System produces over 100,000 jobs, \$11.5 billion dollars in yearly revenues and contributes over \$3 billion dollars in tax revenue. A single 15-barge tow can carry 26,250 tons of cargo or as much as 240 train cars or 1,050 tractor-trailer trucks.

PDI has been involved in numerous civil engineering Mega Projects including the new Midtown Tunnel in Norfolk, Virginia. Carl Liberty explains, “The Olmsted Locks and Dam is one of the biggest civil works jobs ever undertaken by the Army Corps of Engineers. Even though our part is a small piece of the project, it is a very important piece, the whole purpose of the wicket dam is to raise and lower the wickets during low and high water conditions within the Ohio River Navigation System and our winches and controls installed on the Wicket Lifter Barge help accomplish that goal.”



During the past 50 years, all but two of the original wooden wicket dams and locks on the Ohio River have been replaced with high-lift dams. Until the Olmsted Locks and Dam project is complete, this stretch of the Ohio River on the Illinois-Kentucky border has had to rely on two 81-year-old locks and rickety wooden wicket dams named Dam 52 and Dam 53.



Shipping traffic is growing rapidly and the antiquated design of the original wicket dams is making it impossible for the USACE to meet the shipping traffic demands. The lower Ohio River is of special importance because it provides the connection between the Cumberland, Mississippi, Ohio, and Tennessee Rivers.



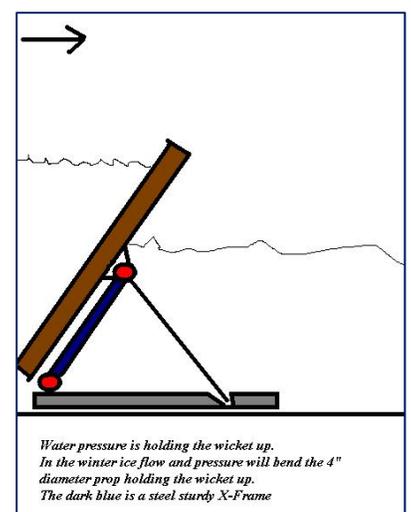
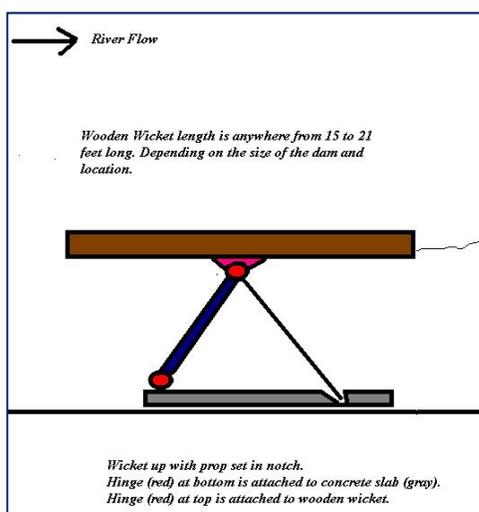
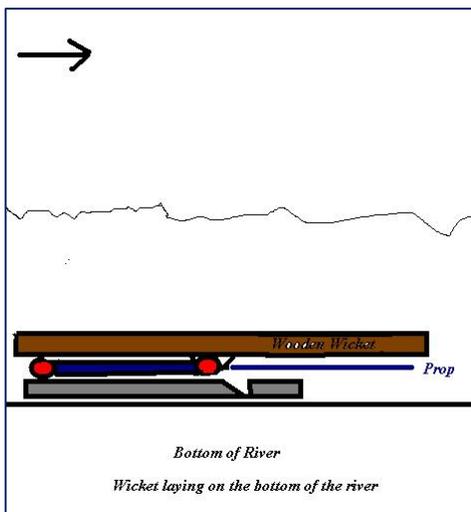
Construction of the new facility (Olmsted Locks and Dam) began in 1993 and is located at Ohio River Mile 964.4, near Olmsted, Ill., approximately 1.8 mi downstream from Locks and Dam 53.

The new dam structure will consist of wicket gates made of steel and concrete across the 1,400 ft. navigable channel. Liberty adds, "This is the last dam to be replaced in a congressional project started in the 1950s to upgrade the turn-of-the-century dams along the Ohio River. Trawling freight along a river is much cheaper and carbon-footprint-friendly than driving it with a truck or riding it along a railroad. One barge can tow the equivalent of about 800 trucks on the roadway." If the locks were to fail, boats that haul around 90 million tons of raw goods every year would not be able to get through because the river's height fluctuates as much as 50 feet over the course of a year.



How the Wicket Dam Works

The wooden wickets on the old dams were large planks that are manually raised to a steep angle or lowered flat to control the river flow. Workers would head out on the river on a steam



powered barge and would raise and power the wickets as needed. When raised, they block water and feed it to adjacent boat locks that harbor barges safely to a lower elevation when the river is low.

Wicket Dam Raising and Lowering Operation: The Old Way

It was a dangerous job, manually raising the antiquated wicket dam may seem like a simple task, but the crew had to work inches away from the rushing water of the Ohio River. The boat is connected to the lock wall by a sturdy stern wire controlled by three operators. They keep the boat and its crew from being swept over the dam and allow the boat to inch on to the next wicket. To lift the wickets, crew members use long crochet-like hooks, or wicket hooks, to grab the wicket eye and pull it out of the water. One of the many challenges, though, is fighting against the powerful current of the Ohio River, blindly probing around in 16 feet of rushing water with a 23-foot steel rod and mate the hook-end with the wicket eye. It took a lot more finesse and technique to find the mark than it did muscle. The Lever rack operator controls foot pedals for the steam-powered friction crane that hooks to the rods and lifts the wickets out of the water.

At low water the wickets are raised, raising the river level. A boat coming down the river enters the lock chamber from the upper level. The doors are closed behind it, and the chamber is emptied of water through valves until the water level matches the lower part of the river. The locks are 1200-foot-long, 110-foot-wide enclosures with watertight doors. The boat can then safely pass to lower part of the river. At high water the wickets are down, boats bypass the locks altogether and go straight over them.

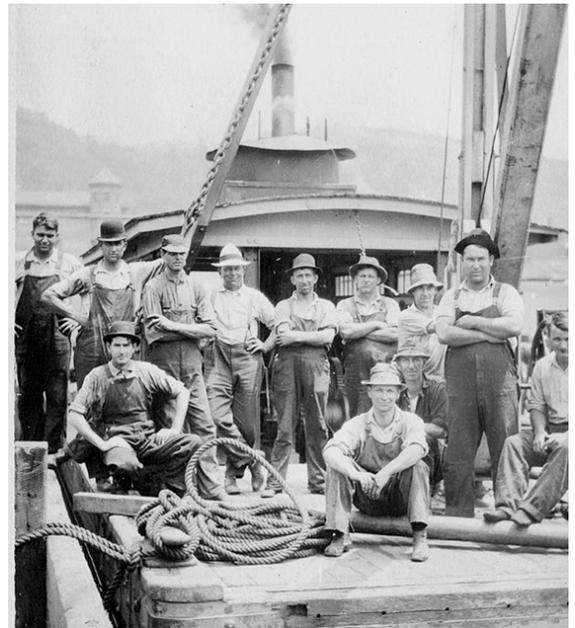
Infrastructure Investment.

In this era of new technologies, a blind eye is often turned to the things that should be addressed. Every family, every community and every business needs infrastructure to thrive. Postponing infrastructure investments in the near term will only add to the problems in the years to come. The average age of infrastructure is at a record high in the U.S following several years of below-average investment. Improving U.S. infrastructure was a common theme in President Trump's campaign, which suggests the potential for substantial new funding to improve and or replace our antiquated public systems.

PDI and its employees are proud to provide to Conrad Shipyards the winches and controls for the US Army Corps of Engineers Wicket Lifter Barge. The Wicket Lifter Barge is a small piece of the Olmsted Locks and Dam Project, but a very important piece.

Fluid Power Industry Leaders

Power Dynamics Innovations **engineering/manufacturing expertise** is known and respected throughout the fluid power industry providing successful fluid power solutions for over Thirty Years. PDI stands today as a leader in the industry, engineering custom hydraulic power units (HPUs), winch and pipeline tensioning equipment and horizontal directional drilling units (HDDs), as well as worldwide repair and maintenance field service. Key to PDI's success has been our team of dedicated employees. To see how we can help you with your fluid power project call us or send us an email. For more information please visit our web pages.



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