

LIFTING LETTER

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Collaborative Approach
to Problem Solving



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BARNHART'S

Collaborative Approach to Problem Solving.

COVER STORY

Barnhart Crane & Rigging has a team approach for every project the company undertakes. While each project offers challenging opportunities, Barnhart's collaborative approach to problem-solving starts with communication with the customer – what does the customer want? The marketing and sales teams bring opportunities back to the engineering and operations teams. Those teams collaborate on the solution process – determining what tools may be applied to the job and coming up with new applications for tools.

When a new project opportunity is brought on board, the teams consider innovative solutions by asking "What if? Can we do this? What else can we consider?" Innovation – one of Barnhart's core values sets the company apart as does Barnhart's nationwide equipment inventory and ability to assemble teams from any of its 27 branch offices. According to Tim Heldman, Barnhart's Vice President of Sales, the company has "a culture of optimization." There are no bad solutions in problem-solving; one may simply be better than another. The teams strive for the common good as a result of the collaborative approach.

Company executives attribute the success to Barnhart's people who not only understand capabilities and know limitations, but who look at ways of doing things differently – especially optimization in unforeseen circumstances. A little innovation can make a big difference. Every decision and choice is made to support the customer's objectives as well as to safely deliver on time and within budget.



REFINERY PROJECT

The Detroit Refining project included participation across several branches and with heavy support from our Memphis Service Center. During the project, Barnhart converted a pull-up gantry into a push-up gantry to jack modules up to a 14' height and set the modules using a Goldhofer platform trailer rather than a traditional approach with a crane. It included the use of our Goldhofer tailing frame, eliminating the need for a tail crane, our MLT for setting the heaviest Reactor and specialized/flexible rigging arrangements for many other pieces of equipment that we set with cranes.





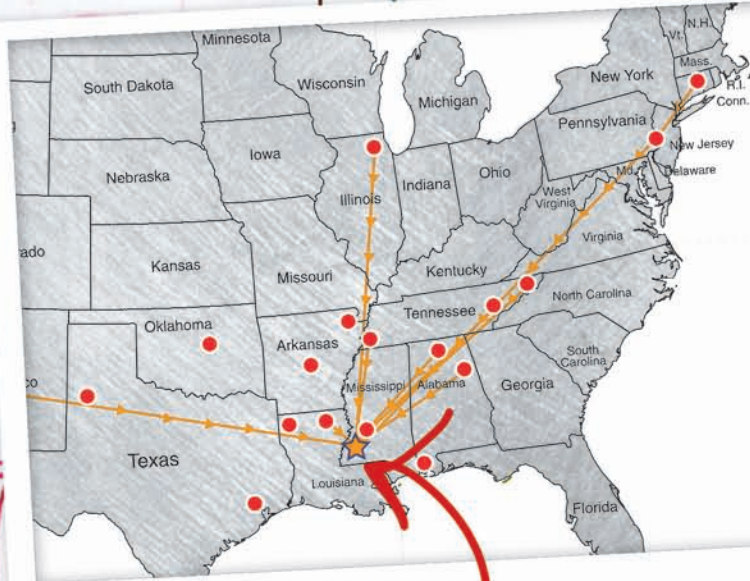
NUCLEAR STATION TRANSFORMERS

Several Barnhart branches collaborated on a project at a nuclear power station to haul multiple Main Power Transformers in a single convoy. The successful work required significant coordination of equipment, additional bridge spanning coordination, and personnel as well as regulatory coordination.



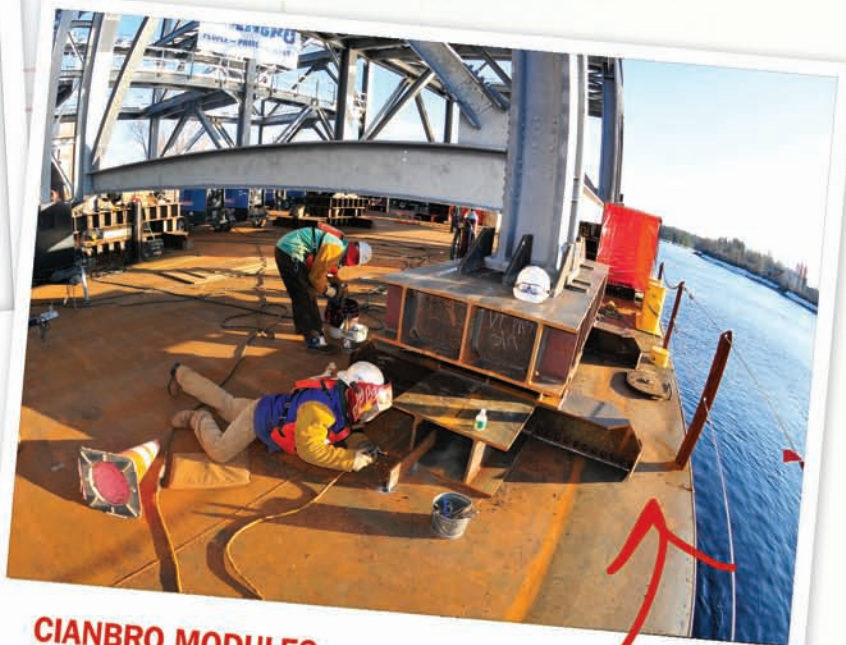
NUCLEAR STATION

Three Barnhart branches and multiple service centers worked together to swap out Feedwater Heaters at a California nuclear station. The design team created solutions that included custom fabrication of gantry tracks and upper works that included the team to make multiple tracks and upper works system. The plan minimized extra work and reduced downtime needed for multiple operations.



COMPONENT REPLACEMENT

Barnhart was awarded the job to remove and replace components at what will eventually be the largest single unit Boiling Water Reactor (BWR) plant in the world. The project scope is to replace all the existing components with larger components to generate additional power for the Mississippi nuclear plant. (See related story, page 13.)



CIANBRO MODULES

Barnhart was awarded a complex project at a coal-fired power station to convert an existing parabolic concrete cooling tower into an internal cooling system. The project required innovation, custom designed equipment and collaboration between numerous Barnhart branches - Marino, Houston, Chicago, Memphis, Hake Rigging, Wind Division, Project Equipment Group, Heavy Lift Crane Group, and Transportation Group.

1000 PAGES
22-14

POWER: Heavy Haul & HRSG Replacement

PROJECT REVIEWS



Barnhart was awarded a project to offload six Heat Recovery Steam Generators (HRSGs) at a Florida port and haul them to the Florida power plant. The project scope was to remove six old HRSGs and install the six new HRSGs. The team received the HRSG modules – each weighing 346,100 lbs. – from ship’s gear and set them on an 18-line Goldhofer platform trailer for transport to the job site where they staged the HRSG modules on stands and beams.

Since there were bridges and culverts along the transport route, the Florida Department of Transportation required the team to use Barnhart’s new Dual Lane Goldhofer Trailer. The crew was able to successfully haul one module per day on the 120-mile round-trip transport.

The older modules were slightly smaller than the tilting frame was designed to accommodate. So Barnhart’s engineering team modified the frame to remove the older HRSGs. The team used a M18000 crane, 22 lines of Goldhofer platform trailer and the Barnhart tilting frame to remove and replace the HSRGs. The entire project was performed safely during a critical outage with no injuries or property damage.

REFINING: Reactor Job



PROJECT REVIEWS

Barnhart's Chicago office partnered with the Memphis office on anchors to anchor bolts, a refinery project in Rosemount, MN. The team's full scope of work was to receive three reactors from ship's gear in New Orleans, secure the reactors to barge, roll off in Minnesota, load test the cranes, haul and stage the reactors for dressing, and finally set them.

The initial contract was to set one 250 ton reactor using a 600 ton crawler crane with the Goldhofer Tailing Device and two 600 ton reactors using Barnhart's Modular Lift Tower (MLT) at the facility. The team first set the 250 ton reactor using a CC2500-1 and the Goldhofer Tailing Device.

However, the customer asked Barnhart to use the M21000 (a 1000 ton class crawler crane) instead of the MLT to set the two 600 ton reactors. The locations in which the reactors had to be set were very close to live units and it would have created a hazard to conduct the critical lifts necessary to construct the MLT. So Barnhart re-engineered the plan to use the M21000 to set the reactors.

The team remobilized several months after the first stage of the project. They used the Modular Tailing Tower (MTT) and the M21000 crane with Max-ER to set the 600 ton reactors. They also met the customer's schedule – a 3-day window – to set the two 600 ton reactors and the units came back online as scheduled.



REFINING: Heavy Haul



underground utilities and miss existing light poles with the tail swing. The team also had to deal with the low ground bearing capacity. In addition to the regular steel mats that are positioned under all outriggers, the team added two additional 1" layers of 8' x 8' steel plates to help spread the load.

Barnhart Crane and Rigging was awarded a heavy haul project at a West Virginia refinery. The project scope was to transport a Naptha Splitter – 6 ft. in diameter, 153 ft. long and weighing 101,000 lbs. – from the fabricator located in Mississippi to the job site in West Virginia, then offload and set the vessel. However, flooding on the Mississippi River created a challenge for the team and resulted in an uncertain pickup date and transport route.

It was impossible to transport such a large piece of equipment through the town next to the job site, because it had too many S-turns. So the team had to change the route which added 125 miles to the journey. Winding roads and construction on the new route made the last 120 miles the longest leg of the journey.

The team met additional challenges during the transport. They had to position the crane outriggers to avoid

The customer required that the crane hook be magfluxed and that the operator have a license in the state of W. VA. In addition, the team had to design a way to support the splitter while it was being dressed out. As a result, the new erection weight was 119,000 lbs. The team used a Liebherr LTM1400-7 500 ton capacity hydraulic crane with super-lift and a 220 ton hydraulic tailing crane to set the Naptha Splitter.



HEAVY LIFT: Independence Hall

Barnhart's Hake Team recently completed a historic job at Independence Hall in Center City Philadelphia. The main tower structure was undergoing a complete restoration. The team's scope was to remove the old spire, set the new spire and then set four large wood panels.

The new spire – a bar of solid 316 stainless steel with a 2" diameter – was 38' long and weighed approximately 780 lbs. Since the top 14' of the spire was powder coated black, one of the team members designed a custom collar that clamped the spire to prevent scratching the paint. Given the job site's historic nature, all the work had to be conservative – from the size of the crane, to the mats required for use on the cobble stone road and to the load test on the collar in the Hake shop before

the actual lift. In addition, the work had to be performed after hours since Chestnut Street had to be completely shut down for the duration of the lift.

The team used a Liebherr LTM1200 with 220' boom to set the spire like a plum bob at an elevation of 175' above ground level. The spire went down into the tower flawlessly until the last two feet where it got stuck in the bottom conduit. The team considered using dish soap to grease the slide, but at 1:00 A.M. above Independence Mall, dish soap wasn't readily available. Fortunately, one of the team members had a tube of sun block and the team used it to grease the slide. It did the trick, and they were able to finish setting the spire in place.



REFINING: High Pressure Separator

Barnhart's HAKE team was contracted to remove and replace a High Pressure (HP) Separator at a Delaware refinery. The former plant owner purchased the 463,000 lbs. HP Separator in 2006 but the project was cancelled and the Separator was put in storage for five years on storage beams and stands.

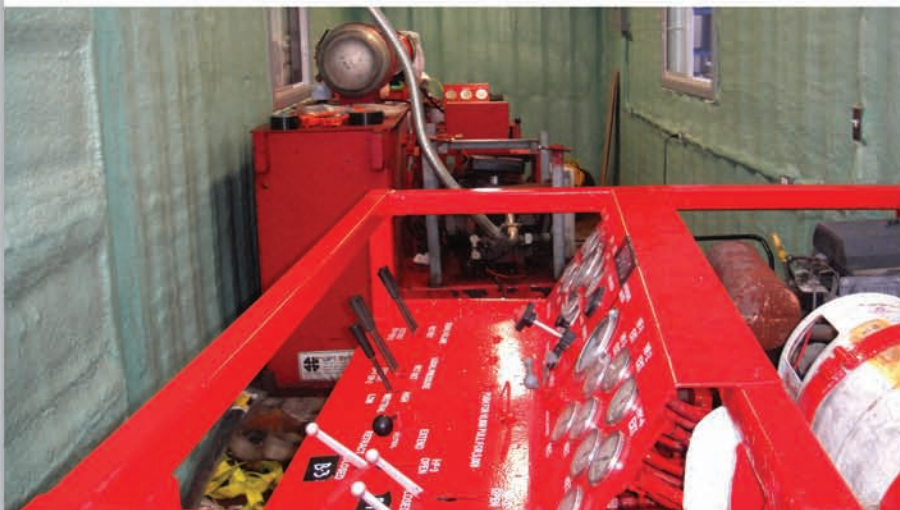
The team used two cranes (a 550 ton crane and a 250 ton tailing crane) to remove the old 215,000 lbs. vessel and they used Goldhofer THP platform trailer to transport the old HP Separator to temporary staging. The former plant owner had planned to set the 463,000 lbs. vessel with a heavy lift crane. However, the new plant owner and engineering contractor did not want cranes or increased ground loading at the job site.

The Hake 400 Lifting System provided the solution. The team transported the 463,000 lb. HP Separator from staging using a 12-line Goldhofer to the Hake Tower components with 500 ton hoist and 5' girders. They removed the separator from the platform trailer (with the tower and gantry in horizontal position on the THP). Then they moved the separator into an upright position with the Hake Tower and a Tailing Gantry. Two legs of a 650 ton J&R crane tailed the separator. Finally the team side shifted the separator using a heavy slide system to the foundation where they set the vessel safely to anchor builds in spite of unusually rough winter weather delays.





NUCLEAR: FWH Replacement



Barnhart was engaged to conduct a feedwater heater replacement (FWH) at an Illinois nuclear plant. In this turnkey project, Barnhart supplied all the engineering, equipment, operators and pipefitters to support the removal and replacement of three FWHs, the heaviest of which weighed 67,000 lbs. The customer needed help maneuvering the FWHs through the plant during critical path.

The team had experienced extreme temperatures of -22 degrees with a wind chill of -44 degrees on a previous project for the plant. Once again they had to find a solution to meet the challenges of working in extreme cold. They used a modified conex and installed insulation on the side. Then they loaded the pumps inside the container to protect them. In addition, the team made sure all the hydraulic lines were heat-traced with insulation to protect them from the temperature extremes.

The team set all three FWHs from start to finish with two crews in only 14 hours. Since the station schedule had been 16 hours to set only one FWH, the customer said it had to be a “new world record”.



REFINERY: Turnaround



Barnhart recently completed a successful turnaround during an Oklahoma refinery outage under the leadership of the Oklahoma branches and with the cooperation and contribution of many branches across the Barnhart network. More than 70 employees were involved round the clock during this outage and the team brought the Barnhart distinction to the job with techniques including the bear paw, cantilever beam, Goldhofer platform trailer and very good crane placement.

Several key factors contributed to the success of this major turnaround – Barnhart’s network, demonstrated experience, and added value of innovative techniques and equipment inventory. The ability to draw on the network was a distinct advantage. Many branches rallied in a collaborative effort to assist with men and equipment. Barnhart’s successful track record on other major outages for the same customer demonstrated the knowledge and experience the team brought to the job. The team’s work on the project used a number of the tools and techniques that add value and define Barnhart – for example, Barnhart’s Cantilever technology. In addition, our team was able to accurately plan the lifts using the cranes’ features including scoping load capabilities and intermediate boom lengths.

Barnhart had representation at each daily safety meeting and the customer was pleased with the team’s diligence and efforts with regard to Risk Management.

NUCLEAR POWER: Security Upgrade



Barnhart's Hake and Marino teams recently completed a security upgrade at a nuclear plant. This collaborative effort by both teams was an unusual project to install "shooting houses" – Defensive Fighting Positions (DFPs) – on the roof of a turbine building. The scope of the project was to provide the crane and engineering to set the DFPs on the roof during a U2 outage.

Although the units were rather light at a weight of 4,500 lbs. each, the radius was relatively large – approximately 200 feet. The team used Marino's Demag AC 300 crane with 178' of main boom and 98' fixed jib at a 20 degree offset. Engineering provided the crane layouts as well as the fabrication and analysis of a specialized lifting beam.





NUCLEAR: Component Replacement

Barnhart was awarded the job to remove and replace components at what will eventually be the largest single unit Boiling Water Reactor (BWR) plant in the world. The project scope is to replace all the existing components with larger components to generate additional power for the Mississippi nuclear plant. The actual on-site work, scheduled to begin in January 2012, will be conducted during an Extended Power Uprate (EPU). However, Barnhart teams have been working off site in support of the project since late December 2010.

When onsite work starts, the team will remove and replace four 700,000 lbs. transformers, two 610,000 lbs. Moisture Separator Reheaters (MSR), a Steam Dryer, and nine 65,000 lbs. Feedwater Heaters (FWH). The Steam Dryer, located inside the containment vessel, is highly radioactive, and safety measures will be taken.

The four replacement transformers were shipped from Korea to New Orleans where they were offloaded to a barge. When the ship got within range of New Orleans, the team released Big AL – Barnhart’s floating barge crane – from Mobile to hook up with the components loaded onto the barge. The barge with the components and the Big AL barge were pushed 195 miles upriver to

the Port of Claiborne County where there was a landing with a dock just a few miles from the nuclear plant.

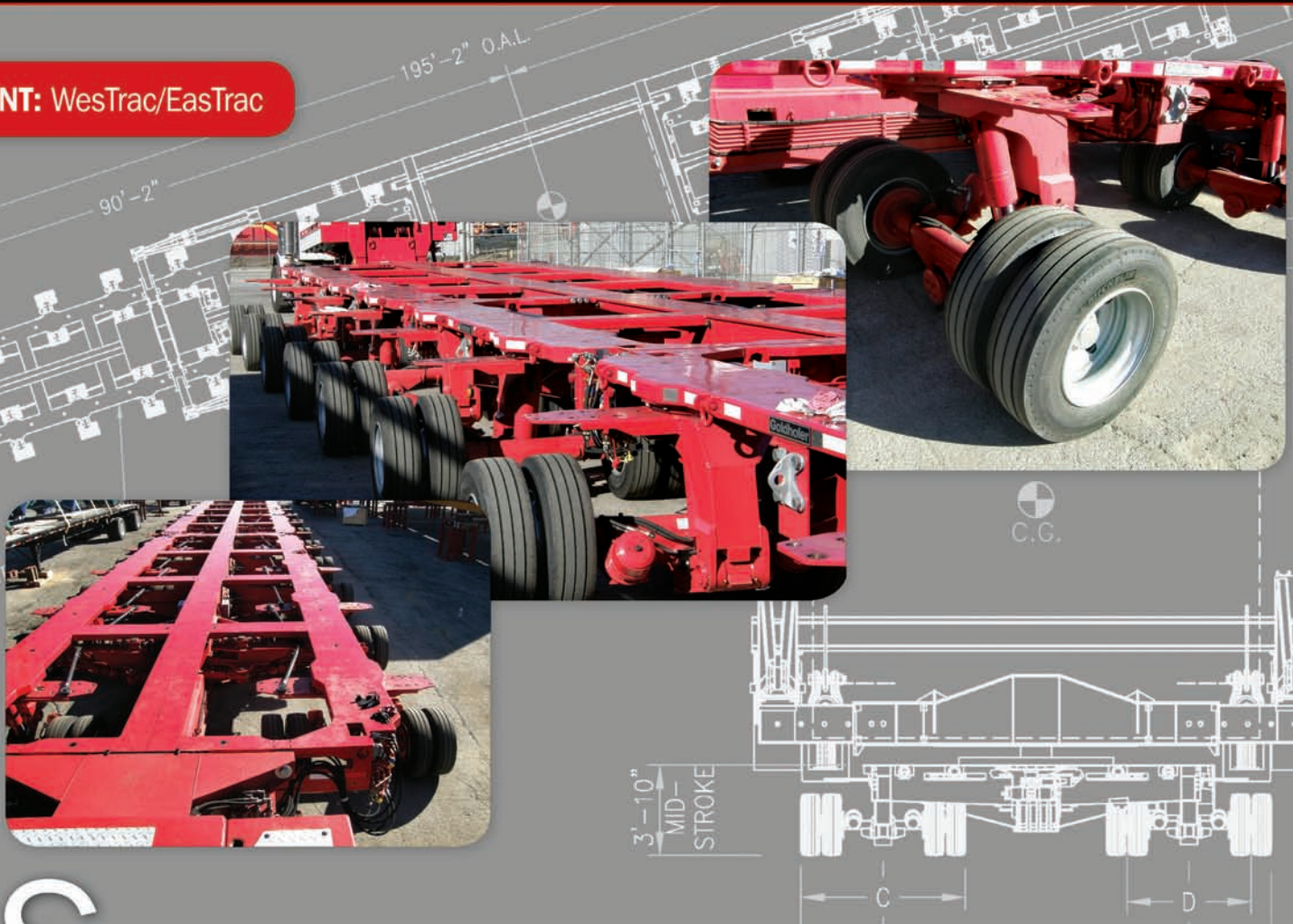
Big AL lifted all four transformers from the component barge and set them onto a 16-line PST Goldhofer at the dock and transported them to a temporary staging location on shore. This evolution was completed in just one day. The team then transported each transformer four miles to the plant, one per day, where they were staged onto pipe stands and beam arrangements at the plant.

The transformers came in “undressed” at 523,000 lbs. and the plant will dress them out – put the components on the transformers and fill them with oil -- reaching the final weight of 700,000 lbs. One transformer swap will be made during pre-outage while the plant is still in operating mode. All safety concerns will be addressed. During the actual outage, the team will remove and replace the three remaining transformers.

Ongoing work continues to prepare for removal and replacement of the multiple plant components. In many cases Barnhart is developing unique systems specific to the components such as a project-specific extraction and insertion gantry system for the Feed Water Heaters.

EQUIPMENT: WesTrac/EasTrac

EQUIPMENT PROFILE



Super heavy hauls on public roads pose challenges in meeting Department of Transportation (DOT) requirements, especially hauling very heavy loads across bridges. Axle spacing of the transporters – longitudinal as well as transverse – is critical because it is essential to distribute the load in a way that’s friendly to bridges and acceptable to the DOT engineers. The traditional solution to this problem has been the use of transportation systems based on two-axle dollies which have allowed Barnhart to complete some of the heaviest long hauls in the US.

Recently, Barnhart engineers began to design a new breed of dual-lane transporter with the features of a modular platform trailer and with the spacing and footprint that best meet DOT requirements across the country. The company is known for innovation – one of the Barnhart’s core values – as well as the ability to fabricate new equipment to meet specific project challenges.

However, in this instance, Barnhart elected to collaborate with one of its key suppliers to develop and manufacture the transporters. Goldhofer will deliver two new dual-lane systems, one that features axle spacing suitable for roads and highways on the West Coast and another that has axle spacing more suitable for roads and highways on the East Coast. The system is designed for efficient mobilization, higher road speeds and variable widths to achieve dual-lane loading and can handle payloads over 600,000 lbs. in some configurations.

Each transporter will work in several different configurations: as a platform trailer, as two trailers with a bolstered load and with suspension girders between two trailers to suspend the load. Barnhart has dedicated teams in Long Beach and Memphis to provide Heavy Highway Hauling to most of the US market. These teams will provide planning and execution expertise including the new WesTrac and EasTrac Systems.

BRANCH PROFILE: Chicago, IL

"We are now within just a few miles of some of the region's biggest industrial sites. It goes without saying, but Northern Illinois and the Three Rivers area are vital to the economy. We hope to play a role in the strengthening of that economy."



L to R: Clay Chenoweth, Randy Williams, Jen Soltis, Ryan Pointer, Brandi Ellerbrock, Matt Wamhoff, Mike Hayden, Bob Kirr, Dan Webb, and Bill Tierney

Barnhart Crane & Rigging relocated its Ottawa, IL branch 50 miles east to a new location in Channahon, IL. According to Barnhart Regional Director Matt Brennan, the new site offers customers a number of advantages. The most obvious benefit is the branch's centralized geographic location that customers can leverage for their own on-demand industrial warehousing site. In its new location, Barnhart is better equipped to handle more demanding special transport jobs and to provide better coverage of the Great Lakes Region.

Barnhart's new location provides customer access to rail routes and waterways and allows transport for heavy equipment barging. The Channahon, IL branch features 72,000 sq. feet of industrial warehouse and storage space available for fabricators, plant owners, and contractors to store various critical spare equipment or capital equipment waiting to be installed. In addition, the new site has increased capabilities to perform machinery moving projects.

Brennan said, "We are now within just a few miles of some of the region's biggest industrial sites. It goes without saying, but Northern Illinois and the Three Rivers area are vital to the economy. We hope to play a role in the strengthening of that economy."



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