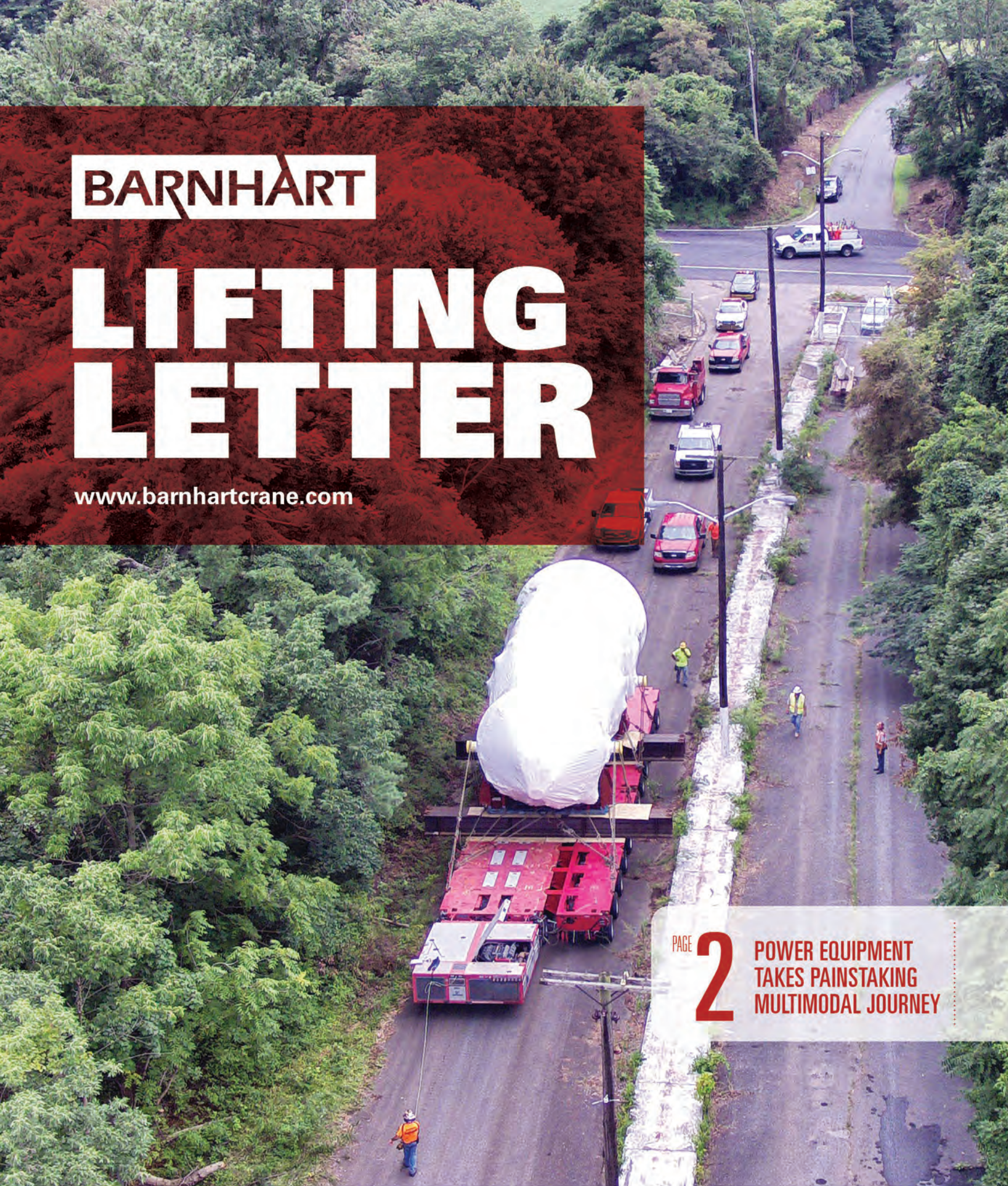


BARNHART

LIFTING LETTER

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**POWER EQUIPMENT
TAKES PAINSTAKING
MULTIMODAL JOURNEY**

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POWER EQUIPMENT TAKES A PAINSTAKING MULTIMODAL JOURNEY

COVER STORY



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More than 2.4 million pounds of turbines and generators traversed rail, water and highway to be utilized in the expansion of a power generation facility in Maryland.

Manufacturers delivered the equipment to the Port of Savannah in Georgia – the turbines arrived by rail and the generators shipped from Japan. From there, Barnhart barged the equipment in two shipments to Port Deposit, MD, then transported it the remaining 26 miles to the plant.

Throughout the process, challenges were commonplace. The late arrival of the first generator from Japan significantly reduced the lag between shipments to just nine days. To make up for lost time, the Barnhart barge had to quickly return to Savannah to pick up the second turbine, then intercept the second Japanese generator at an alternate port.

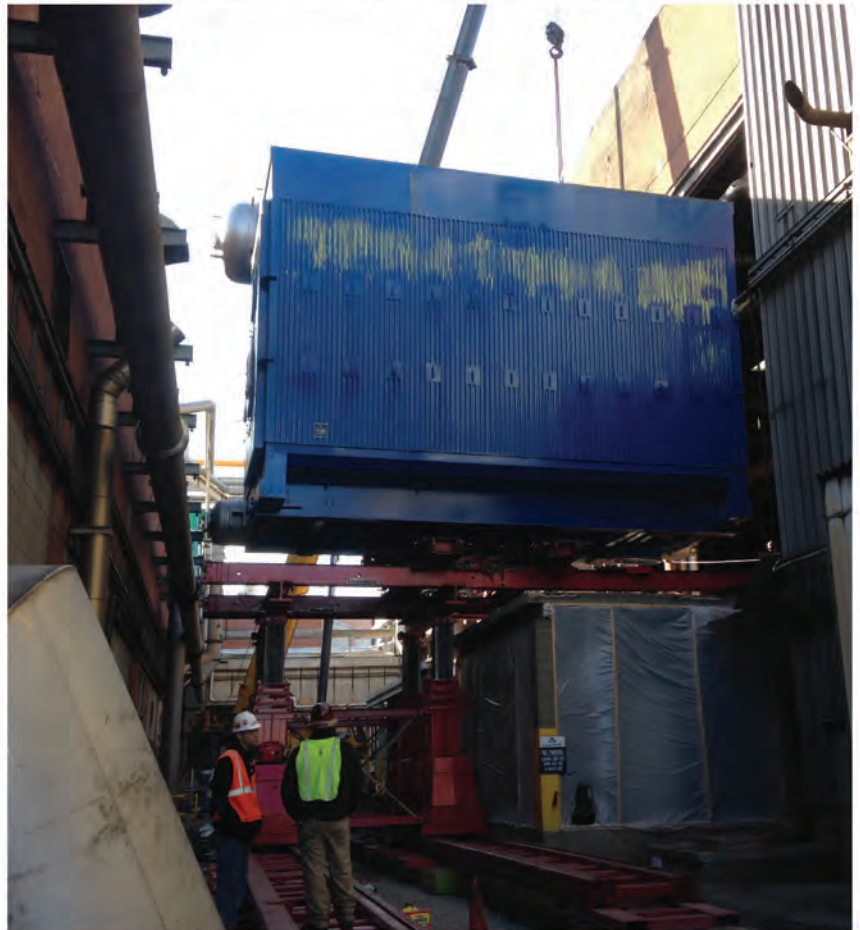
Once offloaded in Maryland, each turbine/generator shipment had to scale a 1 mile long, engine-straining, 8 degree slope aboard a Goldhofer PSTE transport vehicle to reach the GS-800 transport system. The GS-800 was designed and fabricated within Barnhart's Memphis facility and included an 8-dolly arrangement to comply with state axle weight requirements.

During highway transport, the route distance increased from 12 to 26 miles to bypass a bridge placed off limits by the Maryland DOT. Due to the longer route, more than 30 utility lines and cables had to be "pre-raised" to make way for the equipment. Barnhart also steel plated seven locations to protect culverts and pipes, and utilized a Barnhart custom-engineered bridge jumper system to protect a 50-foot-long bridge section.

Traveling an average of only 10-12 mph, the Barnhart team worked 10-hour days to complete the transport in two days. Nearly 65 people – including subcontractors – were needed for the entire operation.



PULP AND PAPER: Boiler Installation



WISCONSIN

In a recent job at a pulp and paper mill, Barnhart's installation of a 400,000 lb. boiler was like threading a needle. The scope of the project was to receive, install and set the boiler at the mill. First, Barnhart offloaded the boiler from a geared vessel at a nearby port facility and hauled it to the site using 10-line PSTe Goldhofer trailer.

Complicating the process was the fact that the boiler had to travel down an alley only slightly bigger than its width to reach its destination, which was an elevated wall opening. Measuring 40' x 20' x 27', the boiler had to be lifted and tracked 130 ft. on Barnhart's 750-ton turntable and 450-ton gantries to the opening.

At the opening, the boiler was rotated on the turntable and slid into the building. The clearances on all sides of the boiler during the rotation were no more than a few inches. It was then jacked down once it was set on its foundation.

Each sequence of the project demanded close attention by the Barnhart team. With a year and a half of planning by Barnhart's engineers, the installation was executed flawlessly. **B**

NUCLEAR: Feedwater Heater Removal And Replacement



MICHIGAN

Barnhart was hired to remove and replace two feedwater heaters (FWH) during an outage at a nuclear power plant. Floor-loading issues were the biggest challenge, as the plant's flooring was not able to accommodate such heavy loads. Barnhart devised an alternate rail system on turbine flooring using over 1,450 ft. of slide track, steel plate and cribbing.

After exploring many different schedules with the plant, Barnhart designed a pre-outage and post-outage plan for this system, which eliminated the need for the use of the turbine crane during the outage scope.

Barnhart offloaded the new FWHs from over-the-road trucking using Pull Up Gantries (PUGs), Goldhofer PSTe and staging. They hauled the new FWHs to the turbine truck bay and lifted them onto empty powered saddle rollers (PSR) on the rail system.

The team removed and replaced the FWHs using two sets (8 total) of PSRs, Hillman rollers and jacks. The system was reversed to lift and haul away the old heaters.

The early planning shortened the original proposed outage schedule and the client was extremely pleased with the outcome of the project. Barnhart's planning, execution and attention to detail has led to three FWH projects with this client since the fall of 2013. **B**



COMMERCIAL: Generator Install



LOUISIANA

All projects come with limitations, and on this one Barnhart had to maneuver around some living obstacles. The project was to set three generators ranging from 10,000 lbs. – 40,000 lbs. on the second floor of a commercial building. Alongside the building was a row of pecan trees and the client requested Barnhart preserve them without breaking limbs or causing any damage. This required detailed pre-job planning and layouts.

First, the generators were trucked to the site and were offloaded with Barnhart's 265-ton crane and staged. But the area was so tight between the building and the trees that the team didn't have the room to offload with the moveable cantilever beam. Barnhart had to temporarily stage the new generators in a precise location on the ground in order for the cantilever beam to reach them.

The client would also not allow the crane's matting within a predetermined radius of each tree base to preserve the root system. This limited our crane's available reach points with the total weight of load and rigging being 108,000 lbs.

Despite the challenges, the result was a job well done with no damage to the trees and a customer that was very happy with the work and crew. **B**



CHEMICAL: Absorber Column Transport And Set



PROJECT PROFILES

OKLAHOMA

Barnhart was tasked with transporting a 540,000 lb., 193' long, 16' diameter, Nitric Acid Absorber Column (NAAC) from the Port of New Orleans to a plant site in Oklahoma.

At the Port of New Orleans, Barnhart loaded out to a 200' deck barge from ship's gear. The cargo was then transported to the Port of Catoosa where it was rolled off at the port and offloaded to the port's staging area.

The crew returned six weeks later to transport the piece over the road on two 10 line PSTes approximately six miles from the port staging area to the plant staging area. This involved handling a tough turn near the plant entrance that required negotiations with the plant and several utility companies and building an angled turn road to accommodate the piece.

Three weeks later, Barnhart transported the NAAC into the plant and rough set to anchor bolts using two cranes. Barnhart had to build the CC2800 heavy lift crane in a very tight area without disrupting daily plant operations.

After all of the new equipment was in place, the old NAAC was removed in two pieces and hauled to the staging area for demolition and disposal. The job was executed safely, without incident and without any delays caused by Barnhart. **B**



COMMERCIAL: Chiller/Evaporator Install



INDIANA

Barnhart tackles projects year round, but jobs in the winter can sometimes be particularly challenging. Barnhart was hired to install two chillers and evaporators at a university in Indiana in winter. They received the load from oversized trucks using a 200-ton crane to offload the units. They were then to slide the units through a wall opening and rough set to pad.

Barnhart set up their 500-ton slide system to slide the units through the opening. But keeping the slide system free of snow and ice was a constant challenge. The day prior to mobilizing to site, there was a major snow and ice storm at the job site with temperatures well below zero. The crew had to contend with weather issues for the entire project.

Floor loading capacity was another challenge, as the capacity was 200 psf around the pads and the work area was above a basement. Barnhart was able to work around these issues using a 38' long super slide track which allowed the team to span from outside the building directly to the set location pads. This track was able to span the floor with loading capacities of 200 psf. The strength characteristics of the 38' super slide track eliminated the need for support/cribbing in the floor area. **B**

MANUFACTURING: Crank Assembly Turnaround



PROJECT PROFILES

LOUISIANA

Sometimes it's a dirty job and this time Barnhart had to do it. Barnhart had a dirty job when it was tasked with removing a 20,000 lb. crank shaft and flywheel assembly at a manufacturing plant.

After the crank and flywheel were removed, Barnhart also had to extract the 18,000 lb. grease-covered pie weight, which was in a 15' deep pit below the crank assembly. Since the weight was recessed underneath the edge of the floor at the bottom of the pit, a creative solution had to be found to get it out.

Barnhart used chain falls and a 60-ton crane to drift the piece out and safely remove it. Working with minimal headroom and in very tight, dirty and slippery conditions in and around the pit, the crew had to be careful to avoid any accidents.

Once the new counterweight and crankshaft assembly arrived, Barnhart replaced all the pieces.

The result was a successful job with no injuries and minimal downtime for the customer. **B**



CHEMICAL: Ammonia Converter Replacement



VIRGINIA

Barnhart was hired to unload, upend and set a massive ammonia converter shell at a chemical plant in Virginia. The vessel was 95' long and weighed 660,000 lbs.

Using a CC2800 crane in conjunction with 400-ton gantries, Barnhart unloaded and upended the converter. The team also utilized the Barnhart-engineered adjustable rigging link system (ARLS) as a lifting frame from the hook to the piece.

Tight conditions in the plant were a challenge as Barnhart had limited space to build the crane and set up the gantry system.

After reaching a certain height with the converter at a horizontal position, the gantries traveled forward to tail the piece to the crane. Upon reaching a vertical position, the team disconnected the gantry system and the crane swung left to set the converter on its elevated platform.

Despite the challenges, the project was safely and successfully completed. **B**



STEEL: Mill Pinion Stand Replacement



PROJECT PROFILES

ALABAMA

Barnhart was hired to remove and replace a 146,500 lbs. mill pinion stand at a steel plant in Tuscaloosa. During the project there were several challenges. The pinion stand was located outside the radius of the overhead crane. Floor obstructions around the pinion stand prohibited a 4-leg gantry/slide operation for removal and the ability to position the slide system below the stand.

Barnhart had an extremely tight window of only 35 days to complete engineering, fabrication, testing, and scope of work. The plant outage schedule allowed just five days to complete the removal and replacement of the pinion stand.

To get around the obstructions, Barnhart fabricated two 3' jack housing stands to fit into the extremely limited floor space. The engineering team designed a cantilevered slide system that could be assembled off-site and installed over the pinion stand in one piece, saving critical outage time.

Utilizing the custom fabricated set of jacks and the hook of the facility's overhead crane, Barnhart successfully slid the pinion stand from below the 500-ton slide track to pipe stands within the radius of the overhead crane for removal. The reverse order was executed for the rough-set of the new pinion stand.

This new customer commended our crews for handling some of the unexpected challenges of this project. The company assured us that Barnhart would be the first company they called for their next rigging job. **B**



PETROLEUM REFINING: Heat Exchanger Installation



PROJECT PROFILES

ILLINOIS

Barnhart was contacted by a refinery to develop a plan for the installation of two stacked heat exchangers. The plant had determined that they would not be able to do the job utilizing a forklift due to limited headspace.

The exchangers needed to be installed on the ground level, but were located under a concrete structure inside the unit. Barnhart's sales engineering determined the 30 Kip Sliding Gantry would be the best fit for this project.

Once the refinery agreed to the proposed installation plan and proposal, Barnhart proceeded with the onsite work utilizing the plant crane and support labor. In addition to very tight headroom clearances, the crew faced limited set up and staging areas. Plus, the initial dimensions Barnhart received from the plant were inaccurate, requiring adjustments in the field before the work proceeded.

Barnhart installed the lower exchanger first and set it to its foundation as directed by the client. The team then proceeded to install the second exchanger on top of the first exchanger.

Efficient planning and coordination by the project team and an outstanding performance by the field crew enabled Barnhart to accomplish this project safely, effectively and on schedule. **B**



REFINING: Separator Heavy Haul



PROJECT PROFILES

CALIFORNIA

Barnhart's extensive equipment inventory proved essential in this project, which involved receiving a cold high pressure separator (CHPS) from the Port of Long Beach and hauling it to a refinery 35 miles away.

The route involved traveling through the heart of the congested Los Angeles metropolitan area and Barnhart was the only vendor that had a transporter - the GS-800 girder transport system - that could haul the CHPS low enough to avoid most utility lines.

Barnhart received the CHPS from ships hook, and loaded it on to the GS-800. But before embarking on the journey, they had to obtain oversize load permits from the State of California, Los Angeles County, Los Angeles City, and the cities of El Segundo, Hawthorne, and Gardena. In addition, approval was also required from several utilities along the way.

At the refinery, the low clearance of the GS-800 allowed Barnhart to travel all the way inside the unit under low pipe rack and self-offload, thereby eliminating a critical lift inside a live unit. The 10 lines of PSTe allowed the CHPS to be staged within the tight radius that existed for the two cranes that would do the final set.

Before the contract was awarded, Barnhart had to provide a meticulously detailed plan of the haul route that included turn-by-turn details with photographs. In the end, the team had less than 30 days to obtain all the necessary permits and approvals.

The plan paid off as Barnhart's Long Beach crew exceeded the client's expectations. **B**



NEW TOOLS: Adjustable Rigging Link System

EQUIPMENT PROFILE



ADJUSTABLE RIGGING LINK SYSTEM

The adjustable rigging link system (ARLS) is a cool tool in Barnhart's equipment arsenal. The ARLS is unique to the industry and offers some big advantages.

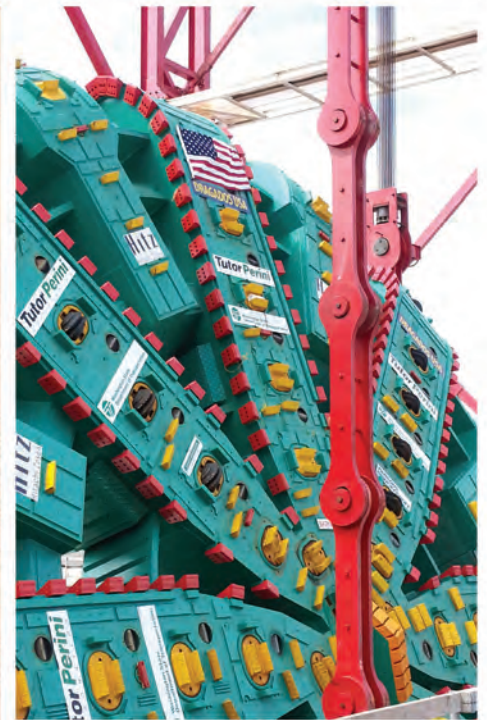
Used primarily for high-capacity loads, ARLS resembles a large bicycle chain. The length of the ARLS rigging assembly can be adjusted down to two-inch increments providing the exact length for any job. Extra accessory components, like hook adapters and shackle adapters, allow it to be modified to handle different loads.

Besides being adjustable, its advantage over synthetic and wire rope slings is durability. It's easy to inspect. Plus, you can use one rigging system for all lifts.

Set up is easy compared to cumbersome wire rope slings. The ARLS comes in a rack and essentially unfolds.

Barnhart has used the ARLS successfully for lifting tunnel-boring machines and other oversize equipment.

"For high-capacity lifts, it's very hard to beat," says Daniel Voss of Barnhart's training and implementation department. **B**



BARNHART: Northwest Region



BRANCH PROFILE

Barnhart's June acquisition of Sicklesteel Cranes, Inc. of Washington State, has increased its presence to five locations in the Pacific Northwest. Sicklesteel, founded in 1937, has a long history of excellence in the area.

With the acquisition, Barnhart added three branches, a fleet of 56 cranes, and tower crane services. While the Seattle area location will continue to operate as Sicklesteel and Pacific Tower Cranes will work under the same name, all others will operate as Barnhart. All the locations in the Northwest will have full access to Barnhart's national network of equipment, engineers and branches.

Barnhart's Washington footprint has grown to include offices in Richland, Tacoma, Portland, Seattle area and the Spokane Valley. The Richland branch offers specialty tools like large crawler

cranes, plus project leadership and support. Pacific Tower Cranes in Tacoma provides complete tower crane solutions for projects.

Sicklesteel customers continue to receive the same high quality crane service and tower crane service they have come to expect. However, through Barnhart's coast-to-coast network, customers have access to the nation's most innovative rigging systems, wind turbine up-tower services, project cargo logistics capabilities, and a department of over 40 engineers.

Barnhart Regional Manager David Webster believes that customers have benefited from the combined companies. "Customers have responded well to the added services that we can now provide utilizing Barnhart's extensive network of equipment and support," he said. **B**



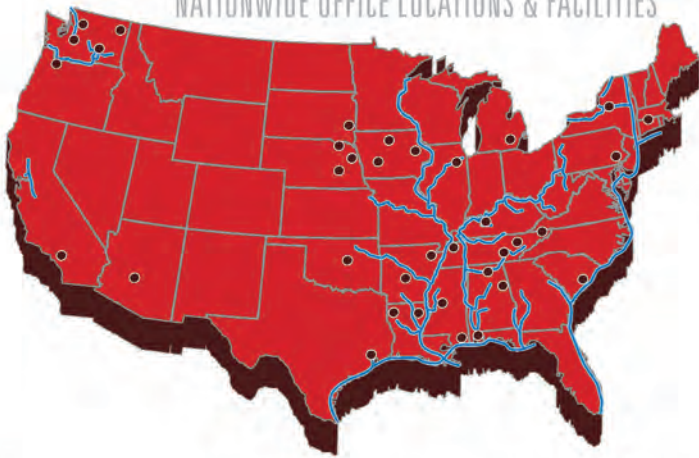
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- Pull-Up Gantry
- Hydraulic Slide System
- Jacks & Rams
- 4-point Gantry System
- Strand Jacks
- Modular Hoists

TRANSPORTATION SYSTEMS

- Dual Lane Transporters
- Goldhofer PSTe
- Hydraulic Dolly Systems
- Barging
- Ramps and Temporary Bridges

MARINE HEAVY LIFT

- Derrick Crane – Mississippi River
- Barge Crane – Gulf Coast
- Barge Crane – Great Lakes
- Heavy Lift Terminal – Great Lakes
- Heavy Lift Crane – Houston

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LATTICE BOOM CRANES

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- Truck cranes from 115 to 800 tons
- Ringer cranes from 360 to 1,800 tons

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- Full turnaround services
- Nationwide Network of Crane Branches