BARNHART

LIFTING LETTER

www.barnhartcrane.com

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FEATURE STORY

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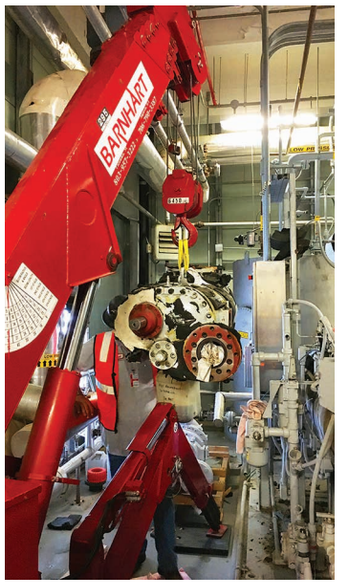


EMERGENCY LANE BREAKDOWNS

Perhaps it's a surprising analogy comparing the maintenance of a car to that of an industrial facility, but that doesn't mean it's a poor one. A recent report found some of the reasons people postpone vehicle maintenance include: 1) lack of convenient time, 2) too costly, 3) can't afford to be without vehicle. One could imagine similar reasons being given as to why so many plants are delaying outages or other maintenance projects. No one can argue about the high cost of shutdowns and, regardless of planning, there certainly never seems to be a convenient time for one.

Still, more than any other reason, it is understandable why so many plant and maintenance managers "can't afford to be without their vehicle." Downtime is not a good thing. If a plant is not operating, it's not making money, which is why so many outage and maintenance managers are under pressure to reduce downtime or put off planned maintenance projects for as long as possible.

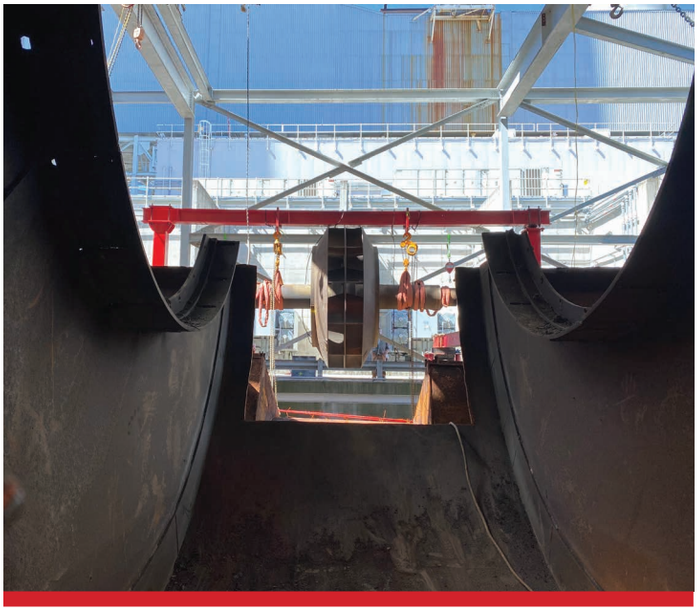
Regardless of the underlying reason, at some point an emergency or unplanned event will force the replacement of plant equipment. When that happens, reducing risk and downtime are still the names of the game.

So, what if you could complete a maintenance project in one shift instead of five, or two shifts instead of seven? How valuable would it be to save multiple shifts and get "back on the road" quicker?

Sometimes, the best of companies with the best of planning can have equipment that unexpectedly fails. Thankfully, Barnhart specializes in developing tools and techniques to remove and replace plant equipment while lowering risk and reducing schedule.

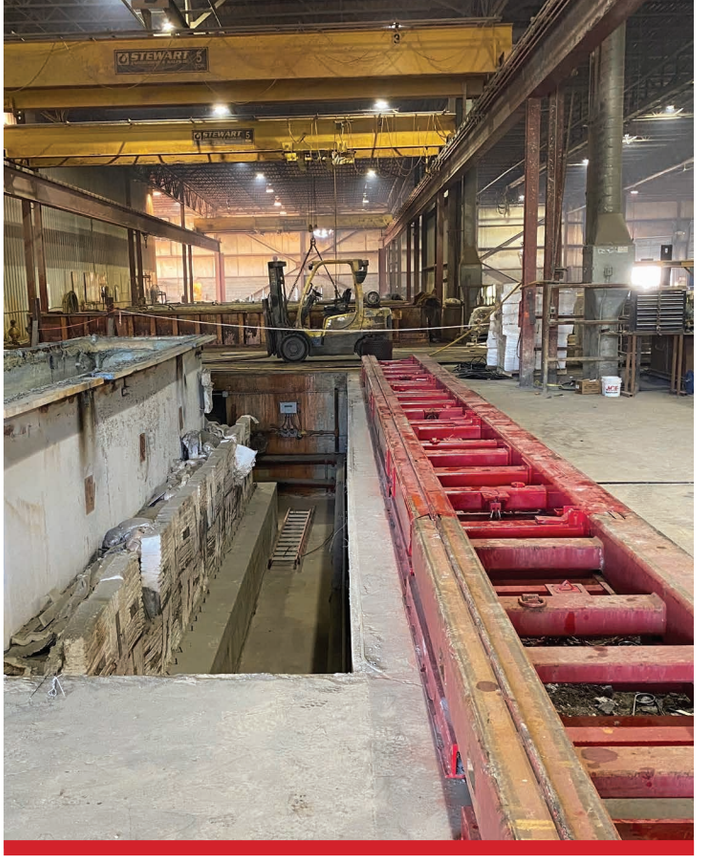
1 Barnhart was hired to remove and replace a fan rotor at a power plant in Tennessee. Challenges included overhead obstructions and a 60-foot wide plant piping trench that had to be spanned. The team assembled a 16" slide system combined with custom-fixed gantries.

2 A beam was placed atop the gantries and two hoists and slings were attached to the rotor shaft. Barnhart's rigging solution provided a method for removal and replacement of the rotor with minimum requirement of overhead duct removal.



3 The fan rotor was then slid out of its housing approximately 50 feet to an opening in the steel structure above. The crew then lifted the rotor from the system with a 275-ton hydraulic all-terrain crane.

4 The crane set the rotor on a shipping stand and then the crew reversed the process for the new rotor replacement.



1 Barnhart provided an engineered plan to remove and replace a damaged scrap kettle 34' x 7' x 8' at a zinc plating facility. The kettle had leaked zinc, which had stuck to the outside of the kettle, making its actual weight unknown.

2 Despite weighing approximately 500,000 pounds, the kettle was removed successfully using pull-up gantries with traveling bases and a 6-line Goldhofer. Then the process was reversed to install the new kettle.

3 The kettle was maneuvered through the plant and back into position.

4 It was then successfully installed. Despite the unknowns with the damaged kettle, the job was completed incident-free and ahead of schedule.

DESPITE WEIGHING APPROXIMATELY 500,000 POUNDS, THE KETTLE WAS REMOVED SUCCESSFULLY USING PULL-UP GANTRIES WITH TRAVELING BASES AND A 6-LINE GOLDHOFER. THEN THE PROCESS WAS REVERSED TO INSTALL THE NEW KETTLE.

1 Transporting heavy loads is nothing new for Barnhart, but a recent multi-state job was nearly one for the record books. Barnhart was hired to transport an energy tower, also known as a deisobutanizer, to a refinery in Superior, Wisconsin. The journey started in Oklahoma City, where the tower had been fabricated and insulated.

2 Two cranes loaded the tower onto a 6-line and 10-line EasTrac. When the pull and push truck was added, the entire convoy was 280 feet long. The rig had 24 total axles, 156 tires and weighed nearly 700,000 pounds.

3 The vehicles and crew of 17, which included police escorts and bucket trucks, left Oklahoma City in late October. The trip to Superior was more than 1,600 miles and wound through six states. The convoy could only travel at a maximum speed of 35 mph on a route that was mostly two-lane roads.

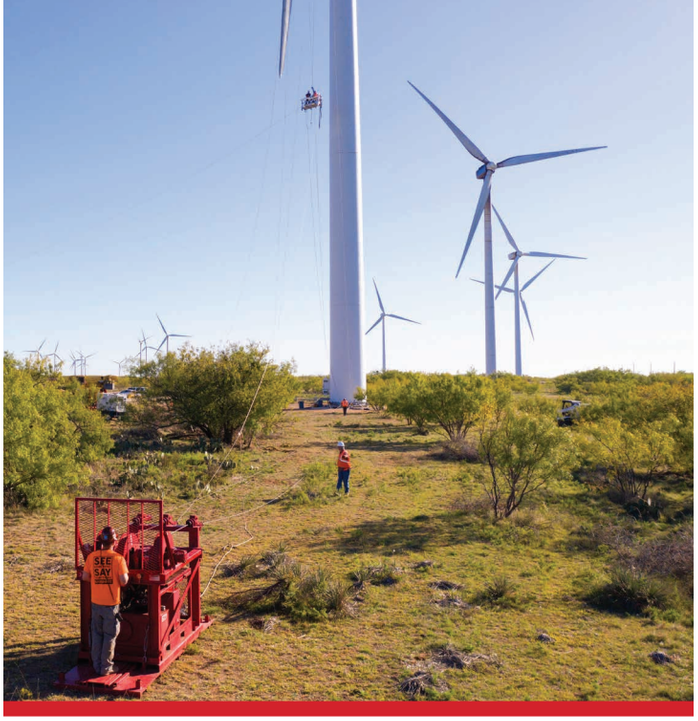
4 The 280-foot-long convoy drew many onlookers. A local school brought its students outside to watch it pass through. The load finally arrived at the refinery after a trip of 16 days and the tower was offloaded. Once assembled, the tower stood 200 feet tall and weighed 130 tons. The haul was the second-largest load ever to enter the state.

1 Barnhart was hired to set 21 bridge girders on three different spans on an interstate junction in Mississippi. Barnhart engineers developed an innovative system using two 9-line, single-wide self propelled modular transporters (SPMTs) and two 6-line, 1½-wide Goldhofer SPMTs.

2 The girders were brought in on a closed roadway for the team to lift and set. The prestressed concrete girders weighed between 138,000 and 203,000 pounds. The longest ones were 170 feet in length.

3 Barnhart used a 1,000-ton Slide System to safely control the lateral shift of the girders and air hoists to compensate for various placement heights.

4 The two sets of self-propelled trailers (PSTs) were spaced 133 feet apart and separated by the new bridge. One set was on a Hwy. 51 bridge during the lifts while the other PSTs were on an I-20 bridge. The SPMT system allowed Barnhart to relocate the lift system to the next girder while meeting the loading requirements. Despite delays with girder delivery, Barnhart completed the project ahead of schedule and under budget.



1 Barnhart was hired to exchange blade and pitch bearings at a wind farm in Texas. The team employed a new "craneless" method. This method utilizes a smaller assist crane and ancillary equipment in place of the large crawler cranes that are normally used.

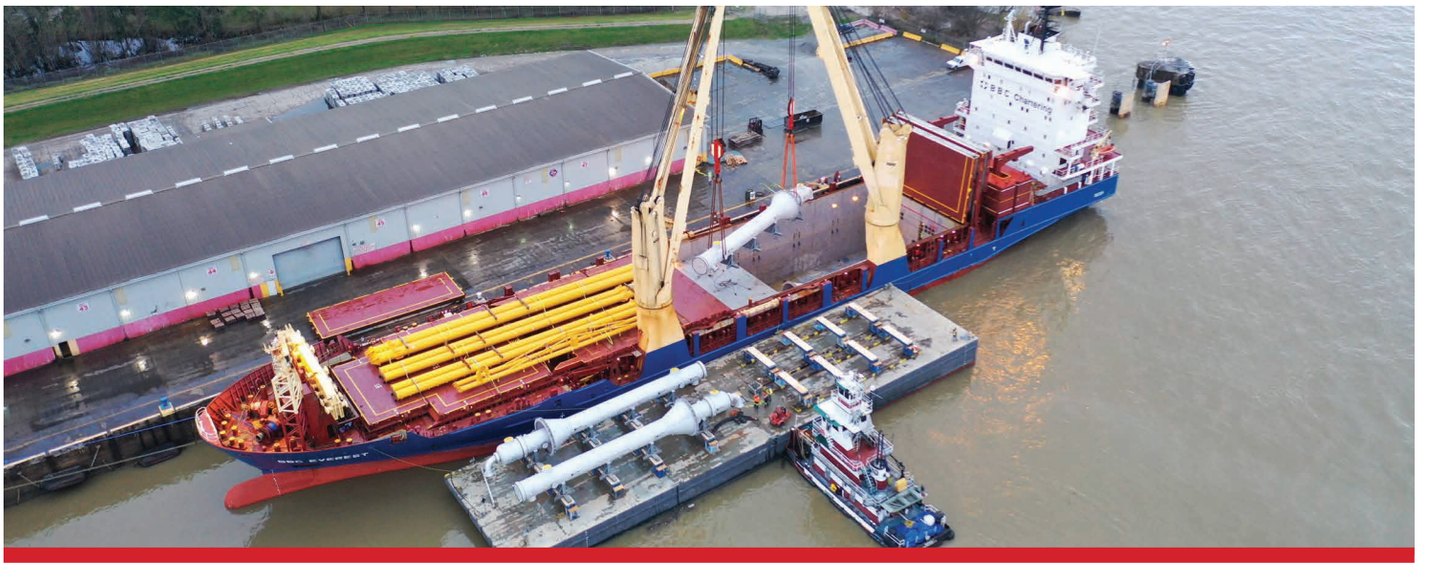
2 Due to an issue with the blade's structural integrity, the craneless method had to be modified to this specific blade type. Barnhart's technical team quickly developed a modified procedure using mechanical rotor lock plates and trailing-edge and leading-edge protection (or blade tacos).

3 The first phase of the project was to lower the damaged blade using the craneless system with the modified trailing-edge and leading-edge protection.

4 The second phase was to safely raise the blade using the same system after the repair was completed.

THE TEAM EMPLOYED A NEW "CRANELESS" METHOD. THIS METHOD UTILIZES A SMALLER ASSIST CRANE AND ANCILLARY EQUIPMENT IN PLACE OF THE LARGE CRAWLER CRANES THAT ARE NORMALLY USED.

1 Four Texas Towers in Italy needed to be delivered to Illinois. The towers, 87 feet long and weighing up to 325,000 pounds, were barged to the Port of Marghera by the local fabricator. Barnhart received the towers from the barge directly to the heavy lift vessel, BBC Everest.



2 After nearly a month's journey by sea, the towers arrived at Associated Terminals in New Orleans. Barnhart's crew received the towers to a 250' x 54' deck barge by the ship's gear.

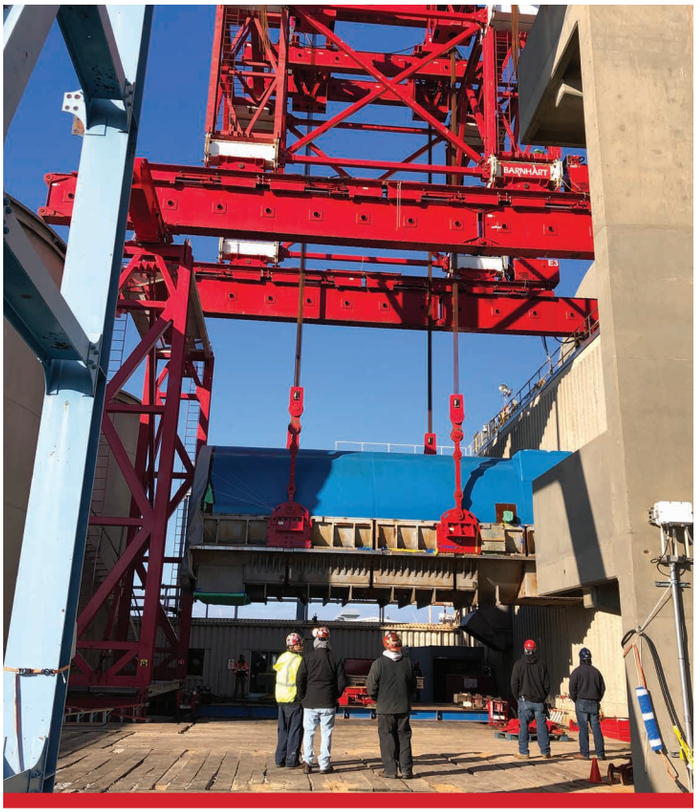
3 The barge journey was made under a dedicated tow to the roll-off location. Upon arrival in Joliet, the Barnhart crew rolled the cargo off the barge and transloaded to self-propelled platform trailers. But paralyzing snowstorms resulted in icy roads and subzero temperatures, complicating the final leg and delaying delivery for days.

4 Once the weather finally lifted, Barnhart transported the towers to the site one by one. The sections were self-offloaded to stands and beams. From beginning to end, the towers traveled roughly 9,000 miles.

1 Barnhart was hired to remove and replace a stator at a nuclear plant in New Jersey. A load test was first performed, which involved the assembly of a Modular Lift Tower (MLT) frame at Barnhart's Memphis location. The test load weight, including support girders, was 1,332,160 pounds, or 125% of the lift load.

2 At the site, an MLT, 750-ton hydraulic turntable and 500-ton slide system were used to rotate the stator.

3 The MLT was tight between two water tanks, overhead gantry crane bents and a turbine building. There was just six inches of clearance between the turbine building and stator during the lift tower operations.



4 Strand jacks were utilized to raise and lower the stator. The project required more than 50 calculation packages, 70 drawings and 650-plus match-marked components. But the work paid off in a project that was completed safely and without incident.

1 Barnhart was tasked with delivering a surge tank vessel from a fabricator in Paramount, California, to Lake Mead, Nevada, a distance of 490 miles. The vessel was 105 feet long and weighed 310,000 pounds. It was hauled by a 10-line Goldhofer and two push trucks, making for a combined total weight of 548,450 pounds and an eventual length of 180 feet.

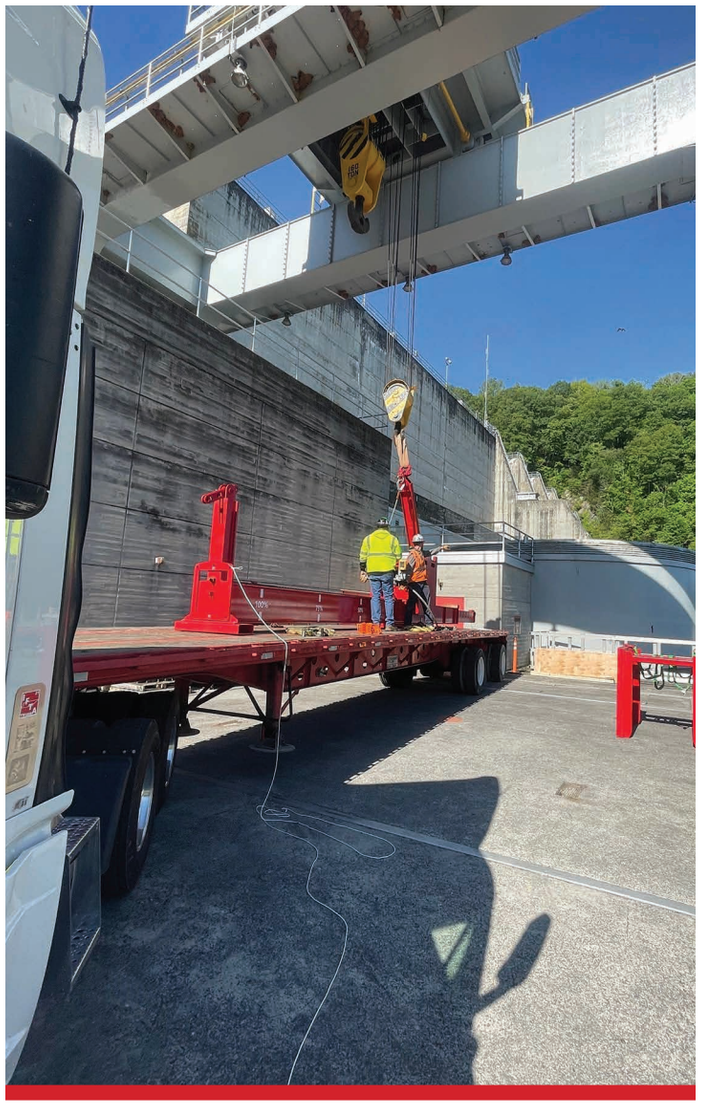
2 Barnhart had to mobilize, assemble and operate specialized transportation equipment, prime mover escorts and support equipment. They secured all permits from the required transportation departments and other authorities. The convoy relied on the assistance of the California and Nevada highway patrols in order to make its necessary turns.

3 The vessel was delivered successfully due to the combined efforts of Barnhart's preplanning and field team and all the third parties along the route, from utility crews to city and county inspectors.

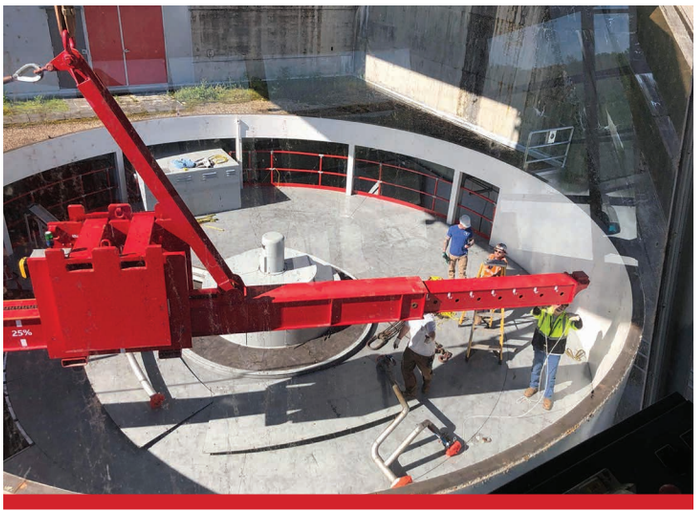
4 The tank was offloaded from the Goldhofer and set using 500-ton one-shot gantries.

BARNHART HAD TO MOBILIZE, ASSEMBLE AND OPERATE SPECIALIZED TRANSPORTATION EQUIPMENT, PRIME MOVER ESCORTS AND SUPPORT EQUIPMENT.

1 Barnhart was contacted to provide a rigging solution for the removal and replacement of three 2,500-pound chiller units on the No. 3 turbine at a hydroelectric facility in Tennessee.



2 The onsite overhead crane was only designed to extend to the center of the turbine, falling about 12 feet short of reaching the chillers. There was no way to utilize a truck crane because the turbine was on the far side of the dam. It looked like a job for Barnhart's Mini Movable Counterweight Cantilever System (MOCCS).



3 The Mini MOCCS was used with the client's overhead crane to reach the chiller units. The system allowed the load to pivot and skirt around the outside of the turbine houses with less than one foot of horizontal clearance.

4 The job was completed in less than one shift and the customer was extremely pleased with the method and professionalism of the Barnhart associates.

LOS ANGELES, CALIFORNIA

THE BRANCH SERVES ALL HEAVY INDUSTRY IN CALIFORNIA, NEVADA, UTAH, NEW MEXICO, ARIZONA AND THE SURROUNDING AREAS.

Industrial Gas Processing: Barnhart used a dual-lane over-the-road trailer and 500-ton gantries to deliver and set a 634,000-pound natural gas sludge catcher.

Barnhart's Los Angeles, California, branch has been providing specialized rigging, machinery moving, heavy lift, storage and transportation services for more than a decade. From its location on the coast, the branch serves all heavy industry in California, Nevada, Utah, New Mexico, Arizona and the surrounding areas.

Proximity to the Port of Long Beach is a particular asset for the branch, according to Branch Manager Chris Howe. "Many components come into the port, and our branch location and network allow us to transport, lift and set heavy cargo anywhere in the United States," says Howe. "Plus we have a nearly 100,000-square-foot facility ready to unload, store and reload your heavy cargo."

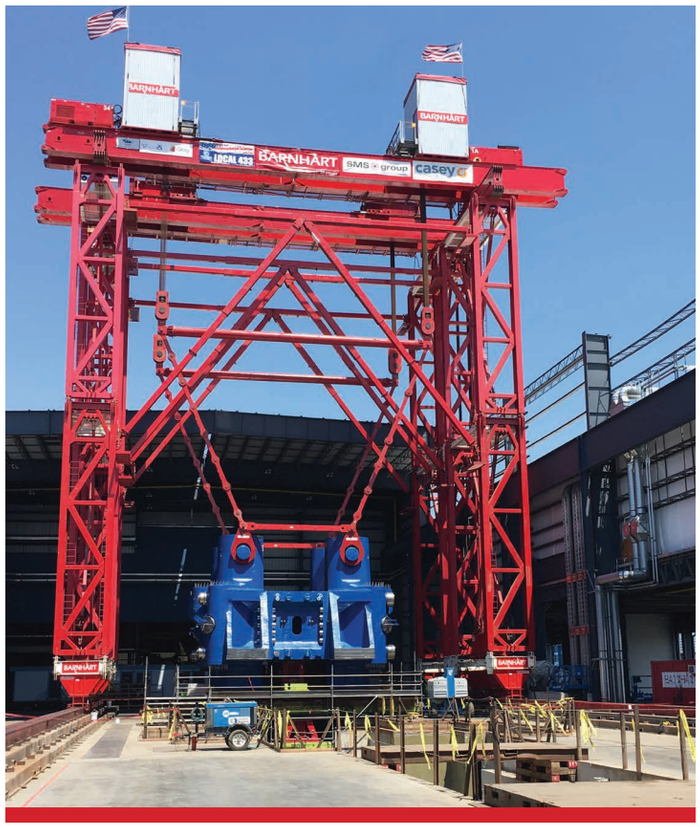
Barnhart's transportation fleet includes dual-lane transport trailers and a GS800 suspension girder system, which allows for over-the-road transportation solutions for cargo up to 800,000 pounds. Additionally, Barnhart can provide turnkey project logistics, storage and unloading and setting onsite.

In addition to the branch's specialized over-the-road transportation equipment, its fleet includes self-propelled modular trailers, hydraulic jacking systems, 500-ton hydraulic sliding systems, up to 1,000-ton hydraulic gantries, up to 70-ton industrial forklifts and cantilevering equipment.

Barnhart's Southern California branch is here to help all heavy industries in the Southwest as part of a network of more than 50 branches across the United States.

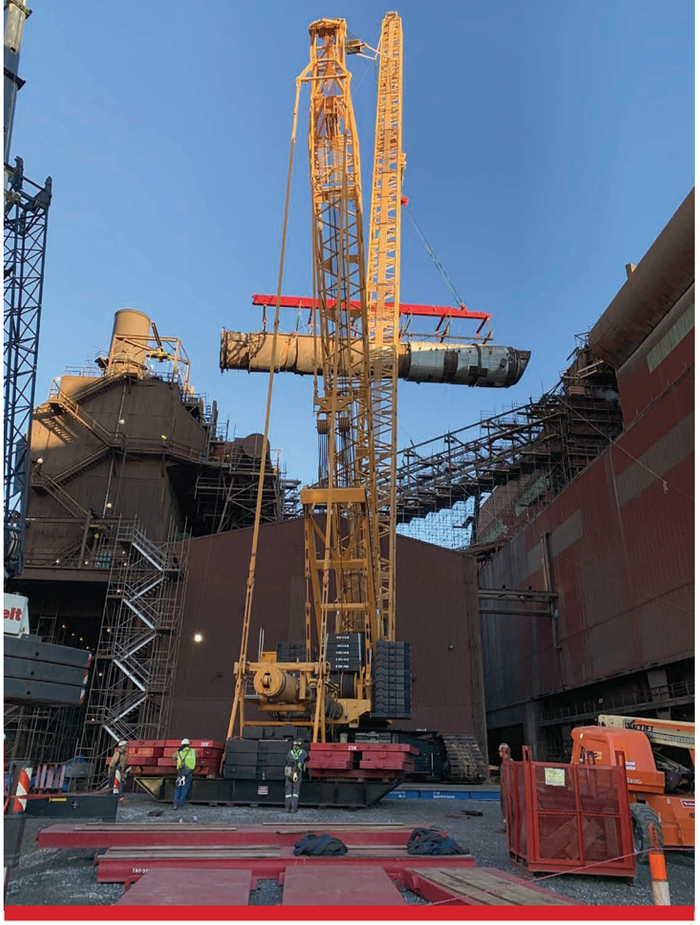
Refining: Barnhart uses its MOCCS cantilevering system to streamline heat exchanger replacements in a local refinery.

Heavy Civil: The team uses SPMT and jack and slide to move an 800,000-pound bridge.



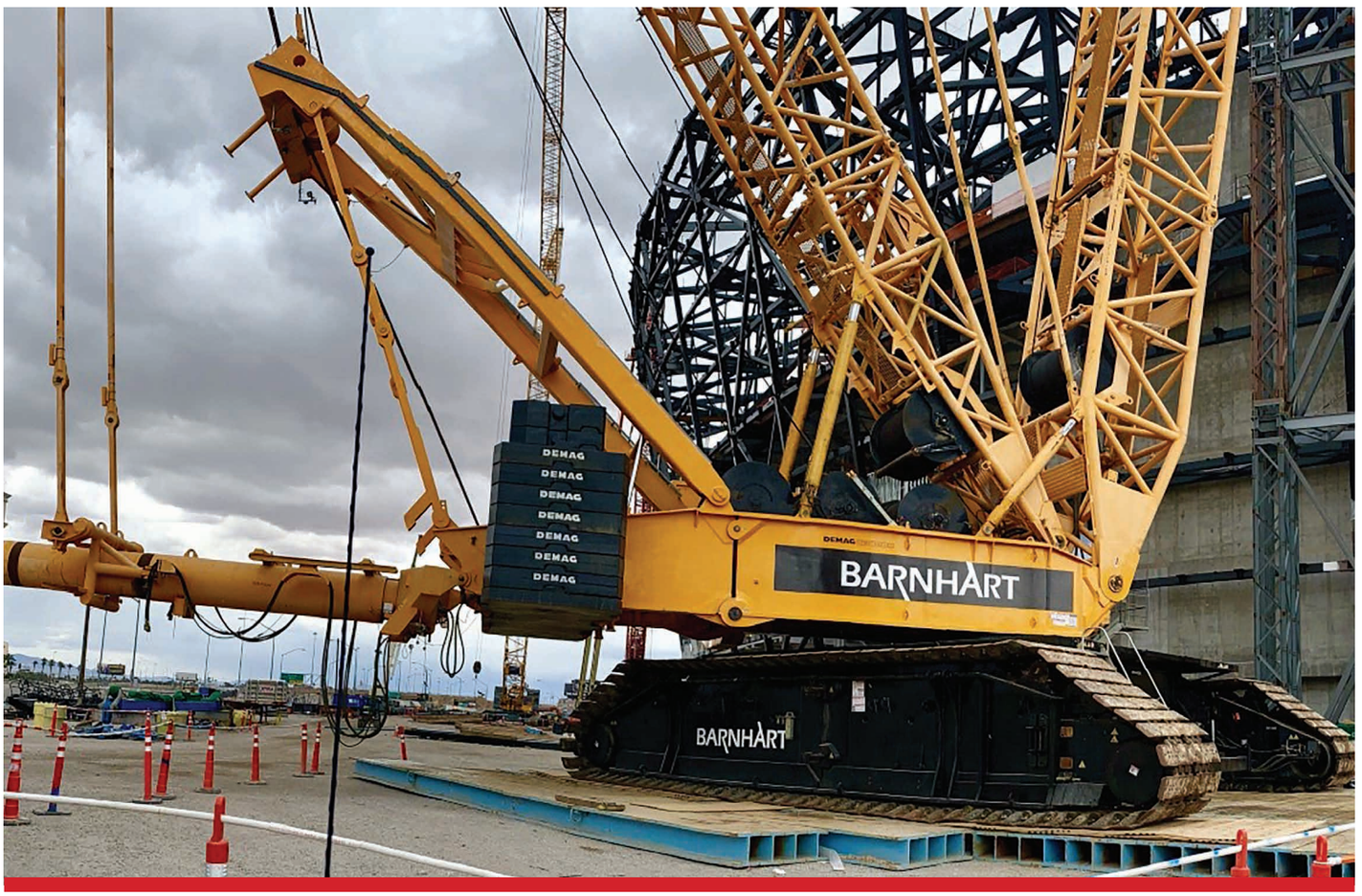
Steel Manufacturing: Barnhart lifts and sets a 2,200-ton piece of a press using its modular lifting tower and strand jacks.

Aerospace: Barnhart hauls a 200,000-pound autoclave in its suspension girder system in Southern California.



The CC8800 in action at a steel mill with customized rigging that provided horizontal rotation in the air.

The CC8800 helps with construction at the Nashville airport lifting 180-kip truss sections at a 328-foot radius.



Helping build the Raiders stadium in Las Vegas in 2019.

A 500-ton truss of the stadium lowered into place utilizing hydraulic cylinders incorporated into the rigging for much-needed fine-tuned adjustment.

CC8800 CRANE

THE 8800 COMES WITH OVER 1,100 TONS OF COUNTERWEIGHT.

Barnhart's Demag CC8800 1,375-ton crawler crane is one of the top 10 largest crawlers in the U.S. market. It is a mega lift crane that can be assembled in as little as 6 to10 days.

The 8800 comes with up to 617,000 pounds of main counterweight, 221,000 pounds of ballast counterweight and up to 1,411,000 pounds of super-lift counterweight. That's over 1,100 tons, which is the equivalent of almost 50 truckloads of counterweight.

One of Barnhart's differentiators is that it has branch locations from coast to coast and owns a fleet of smaller Demag crawler cranes. And the counterweight of those cranes is interchangeable with the CC8800.

Barnhart has the ability to competitively ship the crane almost anywhere in the U.S. at reasonable rates. We also have a large supply of engineered steel matting that can reduce ground bearing in typical plant settings.

Potential markets where the CC8800 can be utilized include:

- Heavy steel erection (large stadiums or airports)
- Refinery FCC outages and other capital or maintenance work
- Steel mills for large duct work removal and replacement work
- Space industry for erection of large launch pads
- Offshore wind – laydown yard/pre-assembly at the port to assist in loading out large wind turbine components
- Large kiln or Yankee dryer removal and replacement projects where going through the roof is the only viable option

It's not just the big hook that Barnhart supplies, it is what comes with it. Innovative below-the-hook rigging, local branch support and fully customized engineered lifts backed by a large engineering team are available throughout our branch network.

BARNHART

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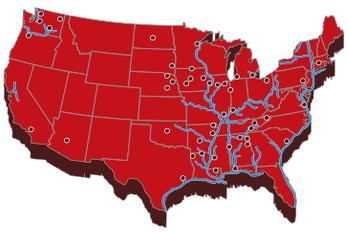
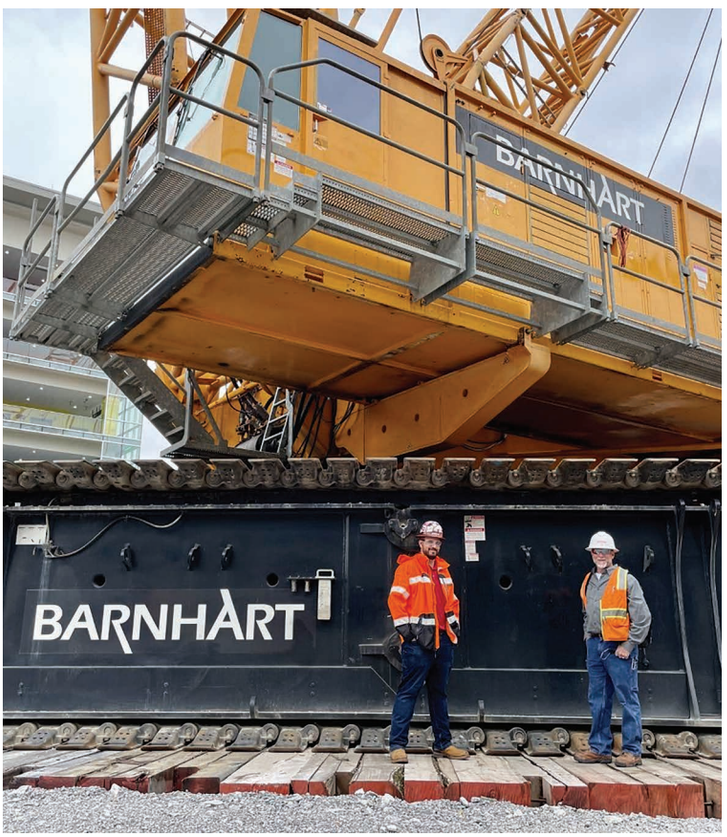
NATIONWIDE OFFICE LOCATIONS & FACILITIES



- ANNISTON, AL
- DECATUR, AL
- GADSDEN, AL
- MOBILE, AL
- BLYTHEVILLE, AR
- LITTLE ROCK, AR
- PHOENIX, AZ
- LOS ANGELES, CA
- MIDDLETOWN, CT
- CEDAR RAPIDS, IA
- DES MOINES, IA
- MASON CITY, IA
- CHICAGO, IL
- EAST MOLINE, IL
- LADD, IL
- ELKHART, IN
- FOWLER, IN
- CALVERT CITY, KY
- OWENSBORO, KY
- BATON ROUGE, LA
- SHREVEPORT, LA
- WEST MONROE, LA
- MONROE, MI
- COLUMBUS, MS
- JACKSON, MS
- PASCAGOULA, MS
- LINCOLN, NE
- OMAHA, NE
- SOUTH SIOUX CITY, NE
- RALEIGH, NC
- MANDAN, ND (VIANT)
- CANTON, OH
- OKLAHOMA CITY, OK
- PORTLAND, OR
- PHILADELPHIA, PA
- CHARLESTON, SC
- SIOUX FALLS, SD
- CHATTANOOGA, TN
- KINGSPORT, TN
- KNOXVILLE, TN
- MEMPHIS, TN
- HOUSTON, TX
- HAMPTON, VA
- KENT, WA (MAGNUM CRANE)
- MT. VERNON, WA
- RICHLAND, WA
- SPOKANE, WA
- WOODINVILLE, WA
- SUPERIOR, WI (VIANT)



BARNHART EQUIPMENT

ALTERNATIVE HEAVY LIFT
- MODULAR LIFTING TOWER
- 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

TELESCOPIC BOOM CRANES
- FROM 7 TONS TO 650 TONS

LATTICE BOOM CRANES
- CRAWLERS FROM 100 TO 1,800 TONS
- TRUCK CRANES FROM 115 TO 800 TONS
- RINGER CRANES FROM 360 TO 1,800 TONS

OPERATED CRANE SERVICE
- OVER 450 CRANES
- LATTICE BOOM TO 1,760 TONS
- TELESCOPIC BOOM TO 600 TONS
- FULL TURNAROUND SERVICES
- NATIONWIDE NETWORK OF CRANE BRANCHES