(PHOTO COURTESY OF NORTH CAROLINA PORTS)

McKIM&CREED
ENGINEERS SURVEYORS PLANNERS

PLANNING FOR SAFE PASSAGE:

MASSIVE CRANES' JOURNEY FROM CHINA TO WILMINGTON

BY MARIANNA BOUCHER, CORPORATE COMMUNICATIONS, MCKIM & CREED

What does it take to ship two cranes—each the height of the Statue of Liberty—from China to Wilmington? In a word, planning. And lots of it.

On March 29, two massive neo-Panamax cranes made their way up the Cape Fear River to their new home at the Port of Wilmington. The cranes began their journey from Shanghai two months earlier aboard a 767-foot-long Zhen Hua vessel. But planning for the transport started well before then.

In fact, logistical preparation began eight months before the cranes were scheduled to arrive, according to Mark Blake, PE, senior director of engineering and maintenance with North Carolina Ports. And there were myriad details to organize.

For example, Mark explained, "The cranes were so wide we had to close down a portion of the Cape Fear River to all commercial and recreational activity." And the cranes were so tall—at 151 feet, each was literally the height of the Statue of Liberty minus the foundation—that they were unable to pass beneath two 230-kv transmission lines that cross the river near the Port.

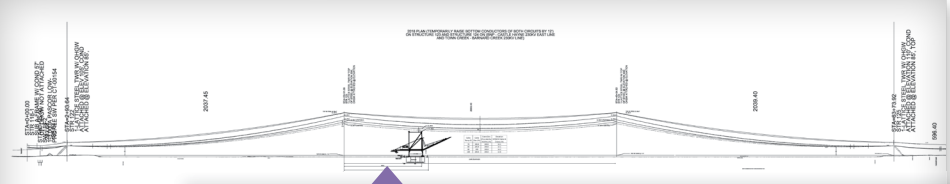
"We looked at modifying the structure of the cranes to make the legs shorter, but it wasn't structurally viable. We feared for the long-term effects on the crane, because those legs must be built to a certain height," said Mark.

THERE WAS ONLY ONE SOLUTION. RAISE THE HIGH-VOLTAGE LINES ABOVE THE HEIGHT OF THE CRANES.

THIS IMAGE, TAKEN IN FEBRUARY, SHOWS THE HEIGHT OF THE TRANSMISSION LINE PRIOR TO THE CRANES' ARRIVAL.

Mark assembled a team to plan and execute the complex delivery. The U.S. Coast Guard handled navigation and safety while the Cape Fear River was closed to traffic. The New Hanover County sheriff's department provided security along the river. Meteorologists tracked the weather forecasts, because winds as high as 15-20 knots would make the entry into the Port too dangerous. River pilots were tasked with guiding the cranes into port, while the U.S. Army Corps of Engineers provided hydrographic surveys in the channel under the transmission line to verify depths.

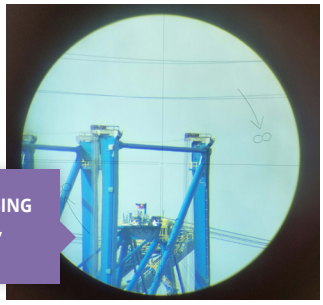
Duke Energy was responsible for de-energizing and raising the transmission lines. And McKim & Creed was charged with ensuring that the lines were raised high enough to accommodate the cranes' height.



THIS DRAWING SHOWS THE RAISED TRANSMISSION LINE. IT WAS RAISED APPROXIMATELY 10 FEET TO ALLOW SAFE PASSAGE FOR THE 151-FT TALL CRANES.

"We started our surveys in February so we could tell how high we would be able to raise the lines," said David Jones, PLS, CFS, regional manager with McKim & Creed. McKim & Creed surveyed the area again after the northern conductor line was de-energized. A final survey was conducted the day before the delivery, when the southern

THIS HIGH-VOLTAGE TRANSMISSION LINE, WHICH CROSSES THE CAPE FEAR RIVER, HAD TO BE DE-ENERGIZED AND RAISED TO ALLOW THE CRANES TO PASS BENEATH IT



THIS SHOWS THE TOP OF THE CRANES PASSING BENEATH THE RAISED TRANSMISSION LINE, WITH A FEW FEET TO SPARE.

conductor was de-energized and raised 10 feet. "We were estimating the clearance to be 10 feet," David said.

On the day of delivery, David and his crew watched from nearby. Viewing the sight through a survey total station so they could see in detail, the crew could see that the passage beneath the lines was successful—with a few feet to spare.

"THERE WAS NO ROOM FOR ERROR," SAID DAVID. "IT WAS AN ANXIOUS MOMENT FOR EVERYONE."

The new cranes will allow the Port to handle more container traffic by simultaneously accommodating two of massive ultra-Panamax ships now calling at East Coast ports. These ships are the result of the 2016 Panama Canal expansion, which doubled the canal's capacity and allowed larger ships to pass. They can carry twice the cargo of the smaller, older ships, and are about one and a half times the size.

"As soon as those larger vessels came, it was a 'proof of concept' that Wilmington is on the map. Wilmington is serving for the future," said Hans Bean, vice president of trade development for the ports, in a Wilmington TV news report.

The two cranes that arrived this spring became officially operational in June. A third and final crane will arrive next year. The cost of the three cranes was $33.8 million, according to the ports.

THE NEO-PANAMAX CRANES ENTER THE PORT OF WILMINGTON.
(PHOTO COURTESY OF NORTH CAROLINA PORTS)

A PORTION OF THE CAPE FEAR RIVER WAS CLOSED TO TRAFFIC WHILE THE NEO-PANAMAX CRANES MADE THEIR WAY INTO THE PORT.
(PHOTO COURTESY OF NORTH CAROLINA PORTS)

THE CRANES APPROACH THE TRANSMISSION LINES ON THEIR WAY INTO THE PORT OF WILMINGTON.