

AMERICAN CONCRETE PUMPING ASSOCIATION

# CONCRETE PUMPING

WINTER 2013



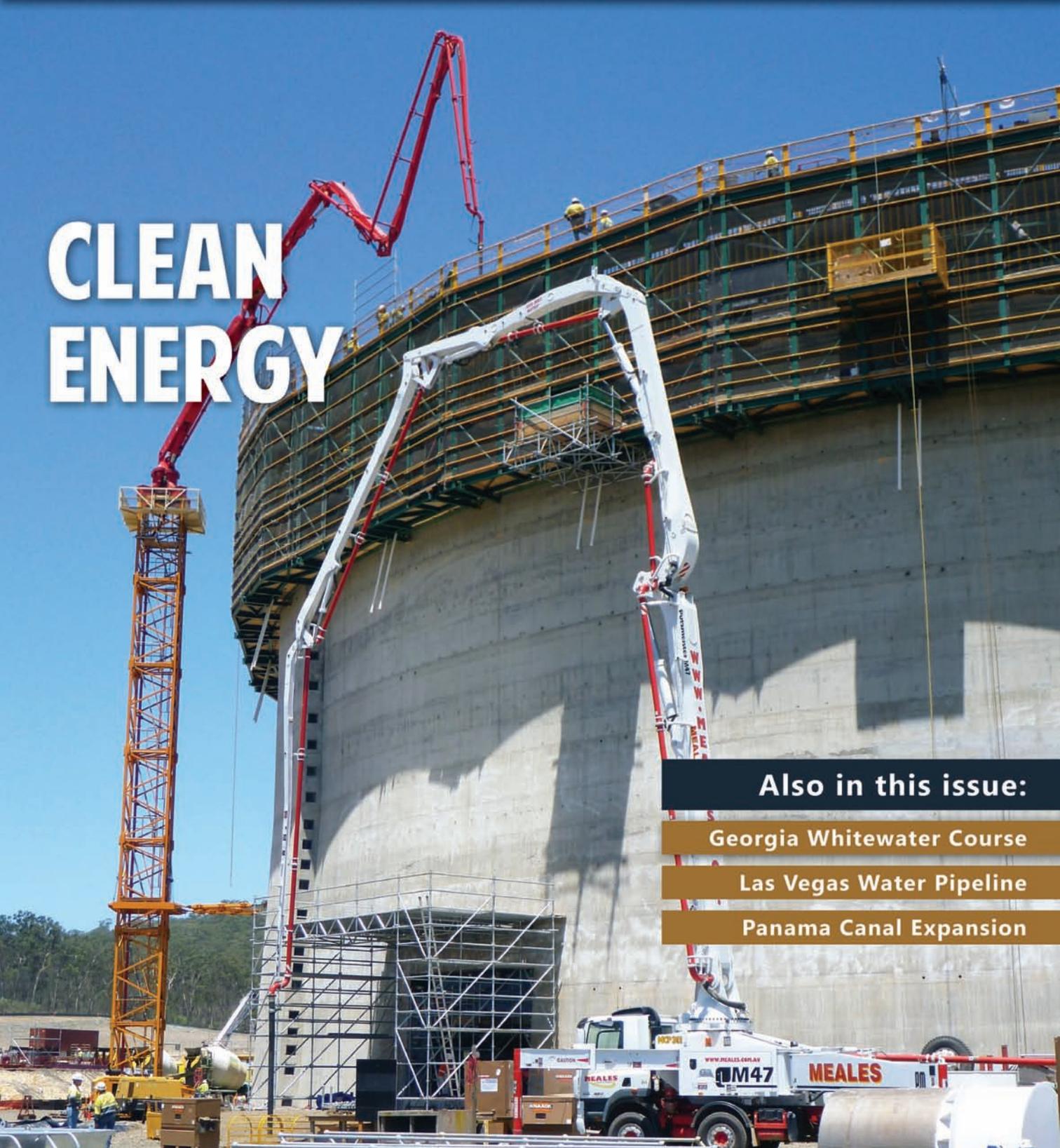
## CLEAN ENERGY

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# LNG: The Train to Cleaner Energy

***This Australian project will generate LNG from coal seam gas.***

Upon completion in 2014, Queensland Curtis LNG (QCLNG) will convert coal seam gas into liquefied natural gas (LNG), providing cleaner hydrocarbon energy for export markets, along with creating thousands of jobs and boosting the local economy. The project is being developed by QGC Pty Ltd, a division of the BG Group, a leading player in the global energy market with operations in more than 25 countries across five continents. Equipment from Putzmeister America, Inc. (Putzmeister) has been working to place concrete at the site since last fall.

QCLNG, located on Curtis Island in Gladstone Harbour, Australia, consists of the construction of a world-class LNG plant. Upon completion, the plant will comprise two LNG production units, known as trains, each able to produce nearly 4.5 million tons of LNG per year; two storage tanks each able to hold nearly 37 million gallons of LNG; a marine facility for passenger and equipment transportation between the mainland and Curtis Island; and marine loading facilities for LNG cargoes.

Most of the 130,000 cubic yards of concrete needed for the plant and accompanying structures for the project is being

*Due to a congested work site and because most of the marine areas are not accessible by land, much of the work for the marine facilities has been performed from barges located in the water.*

placed by Putzmeister equipment, including: two 47Z-meter truck-mounted concrete boom pumps; two 36Z-meter truck-mounted concrete boom pumps and six MX 43/47Z-meter placing booms.

## **LOGISTICS OF LOCATION**

Occupying less than two percent of the island, the plant facility is surrounded by an environmental protection zone. The site can accommodate an expansion to more than 13 million tons per year of LNG, a colorless, odorless, non-toxic and non-corrosive liquid. For the project, Bechtel Australia PTY LTD was chosen as the general contractor and purchased the placing systems; Meales Concrete Pumping (Meales) is supplying the truck-mounted concrete pumping equipment and high-pressure trailer pumps.

One of the more challenging aspects of the QCLNG project is that it is located on an island, which means all equipment,



*Because the project is located on an island, all equipment and supplies are shipped to the site on bulk barges.*



*For the nearly 300-foot wide by 130-foot high liquefied natural gas storage tanks, both Putzmeister placing booms and truck-mounted boom pumps are being used to place the approximately 16,400 cubic yards of concrete for each tank.*

supplies and workers need to be transported across the harbor from Gladstone, Queensland. As a result of the approximately 3,000 workers needed for the job, a temporary construction camp, which houses up to 1,700 workers, has been established on the island. This has helped to reduce road traffic and relieves pressure on the Gladstone housing market. Additional local workers ferry across from the mainland to the island each day.

All aggregate materials for the site's concrete are shipped across to the island on bulk barges, then transferred into six-wheel dump trucks and transported to the two 130-cubic-yards-per-hour batch plants set up by the project's concrete supplier, Boral Concrete. All other construction materials and equipment, including the boom pumps and placing booms, also arrived via water transport.

## **MARINE MANAGEMENT**

Being based on an island, adequate marine facilities are an essential part of the QCLNG project. Thus, the first phase of the construction process involved building a material offloading facility that ships would be able to pull up against during construction to unload their cargo.

The construction team has been using a 36Z-meter truck-mounted concrete boom pump to place the 8,750 to 11,000 cubic yards of concrete required for all marine facilities.

Because of a congested work site and since most of these areas are not accessible by land, building the marine facilities has been a challenge, as much of the work has been performed from barges located in the water.

"The work site near the marine facilities is congested with barges, piling rigs, drill rigs and cranes," explains Peter Lethbridge, general manager of Meales. "The 36Z was especially useful for this part of the project due to its small footprint."

Additional marine facilities consist of terminals for passenger ferries, along with docks and ramps for the barges that transport all the construction vehicles. Eventually, a "jetty" will be built, where ships will go to get loaded with LNG once the plant is complete.

## **TRAINS**

The term "trains" refers to the two LNG production units through which the coal seam gas travels for processing, eventually being converted to LNG. To build the massive trains, two 47Z-meter truck-mounted concrete boom pumps are working to place the majority of the 98,500 cubic yards of concrete for the footings, mat pours, pedestals and columns.

On certain occasions, to supplement the 47Zs, a 36Z-meter truck-mounted concrete boom pump assists in the placement of concrete. The 36Z is used in addition to the 47Zs on mat pours greater than 1,300 cubic yards and for smaller miscellaneous pours, such as many of the pedestals that will support the plant upon completion.

"The Putzmeister truck-mounted concrete boom pumps were selected because they not only allow us to reach the designed heights and complete the large pours efficiently, but they also allow us to move the machines around the site easily with fast setup and teardown times," explains Lethbridge. "On any given



*Upon completion, the liquefied natural gas plant will comprise two production units, known as trains; two storage tanks; a marine facility for passenger and equipment transportation between the mainland and Curtis Island; and marine loading facilities for liquefied natural gas cargoes.*

day the machines could be set up in three or four different locations for the placing of concrete.”

## TITAN TANKS

After the gas is liquefied in the processing plant, it will be transferred to one of two massive storage tanks before exportation. To build the nearly 300-foot wide by 130-foot high tanks, both placing booms and truck-mounted boom pumps are being used. Approximately 16,400 cubic yards of concrete will be placed for each tank.

Six MX 43/47Z-meter placing booms, three surrounding each tank structure, are mounted on 130-foot high freestanding lattice tower sections. Each has two ties back to the tank to help support the free stand height. The systems utilize three BSA 2109 HD stationary concrete pumps. Since the placing boom does not require a counterweight, it has helped to significantly reduce congestion onsite. The crew also is using the truck-mounted 47Zs to support the placing boom systems on larger tank wall pours.

Each tank will require 10 wall pours at about 13 feet high, each of which are poured in a complete ring. The base of each tank will be poured in four sections, which include two outer ring pours and two inner floor pours with each pour consisting of roughly 1,100 cubic yards of concrete.

“The tanks are about 300 feet in diameter, which gives you a fairly significant circumference,” notes Lethbridge. “The placing booms were chosen because they gave the crew complete coverage of the walls, and offer enough reach to access the top of the tanks to pour the roof.”

The placing booms are primarily responsible for placing concrete for the walls and roof of the tank structures. On the lower sections of the tank walls, which are thicker than the top portions and therefore require more concrete placement, the truck-mounted 47Zs are being used to help supplement the pours.

“The truck-mounted pumps allow the pours to be finished in a shorter period of time than if just the three placing booms were being used,” concludes Lethbridge. “This helps the crew to better meet its deadlines, which is vital to any construction project.” **CP**

### Specs:

**Owner/Developer:** BG Group—Reading, England

**General Contractor:** Bechtel Australia PTY LTD—Brisbane, Australia

**Equipment Owner:** Meales Concrete Pumping—Queensland, Australia

**Ready Mix Concrete Provider:** Boral Concrete—Sydney, Australia

**Equipment:** Two Putzmeister 47Z-meter truck-mounted concrete boom pumps; two Putzmeister 36Z-meter truck-mounted concrete boom pumps; six Putzmeister MX 43/47Z-meter placing booms; and three Putzmeister BSA 2109 HD stationary concrete pumps.