

Taking safety to new heights

Installation and replacement of equipment in elevated positions is difficult to achieve, even in the best conditions. CHRISTOPHER COX, president at Engineered Rigging, explains how the company's new patent-pending Pipe Modular Lift System (PMLS) was used at a power plant in the windy Midwestern USA

When faced with wind and rain, accessing elevated worksites and safely supplying them with materials becomes extremely difficult. The Pipe Modular Lift System (PMLS) was created to solve this problem, making it safer, easier and faster to lift massive loads up and into raised equipment hatches.

Rather than relying on a hook to carry heavy loads, the PMLS uses a platform to mechanically raise loads to elevated locations. This approach protects personnel and equipment by eliminating the hazards of suspended loads. It is more efficient than using a crane, Cox says



Christopher Cox

Christopher Cox has been president of USA-based heavy lift, transport and engineering company Engineered Rigging since May 2014 and vice president of PSC since 1999. He is a professional structural engineer in multiple US states.

Battling wind

Unlike cranes, which must halt lifting when winds reach 20 miles per hour (32 km/h), the PMLS operates in 50 mph (80 km/h) winds and withstands 120 mph (195 km/h) winds. This stability benefited a power plant in the windy Midwest of the USA and helped the utility keep a large project on schedule, despite numerous windy days.

The utility was replacing 48 cooling coils and any slip in the schedule meant substantial lost revenue. Complicating matters, all equipment had to be lifted 50 feet (15 metres) to the building's only access point.

After erecting the PMLS, which took five days, Engineered Rigging used its self-propelled modular transporter (SPMT) to move the cooling coils, knuckle boom cranes and components, onto the PMLS platform. This approach cut manpower needs in half - saving money and improving safety by exposing fewer personnel to lifting hazards.

Instead of using a crane, crews loaded heavy supplies from the ground onto the SPMT. "We drove the SPMT onto the PMLS platform and hit the 'Up' button. When the platform stopped, we drove the trailer across the elevated deck and into the plant," explained Bogdan Gaita, Engineered Rigging vice president. "We eliminated below the hook lifting until we were in the building."

For eight weeks the 50-person crew provided 24-hour coverage, performing all outside and inside rigging and handling without any lost time. Historically, the utility would lose two to four days due to weather so keeping on schedule saved the



The PMLS is designed to quickly and safely lift big loads to elevated locations



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utility significant potential lost revenue.

The configurable PMLS can have 400, 800 or 1,200 tonne lifting capacity and a square, rectangular or round footprint tailored to site conditions. Height can be increased in 10 foot (3 m) increments (standard columns) or customised, achieving vertical travel distance exceeding 50 feet (15 m). With a lift

speed of 20 inches (500 mm) per minute, the PMLS is twice as fast as strand jack systems, Cox says.

“Every job is different. The PMLS variable lifting capacity handles even the heaviest loads,” said Gaita. “Its flexible footprint accommodates crowded work sites, while its configurable height efficiently reaches elevated locations.”

PMLS SPECIFICATIONS

LIFT SPEED:

20 inches per minute (500 mm/min)

LIFTING CAPACITIES:

400, 800 and 1,200 tonnes

VERTICAL TRAVEL DISTANCE:

up to and exceeding 50 feet (15 metres)

LAYOUTS:

square, rectangular and round

SIDE LOADING: 5 percent

SHIPPING:

12 standard ground transportation trailers

ASSEMBLY:

five shifts or fewer

WIND LOAD:

50 mph (80 km/h) - operating. 120 mph

(195 km/h) - high winds

POWER FAILSAFE:

load remains in place until power is restored

Safe and synchronised

Using a platform rather than a hook delivers significant benefits. There are no cable drums or strands to fail, or hydraulics to leak. The self-locking PMLS provides synchronised lifting and positive engagement at all times.

Computerised controls keep the platform moving at a constant speed and set vertical travel distance. Redundant safety limits prevent the PMLS from travelling beyond the set distance. If the power fails, the load remains in place on the secured platform.

Getting the PMLS to the work site is simple and the assembly quick. It ships in 12 trailers, versus the 25 to 30 needed for high-capacity cranes, Cox says. It assembles in five shifts, or fewer, compared to three to four weeks for comparable systems.

PSC crews drove the loaded SPMT from the PMLS platform and into the equipment hatch



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