

ENERPAC APPLICATION INSPIRATION



- Buildings and Stadiums
- **Bridges and Infrastructure**
- Manufacturing
- Power Generation
- Steel and Metal Production
- Oil and Gas, Petrochemical
- Shipbuilding
- Mining

Enerpac Application Inspiration



POWERFUL SOLUTIONS. GLOBAL FORCE.

Equipment for Bridge Construction and Maintenance

Enerpac offers highly specialized tools and equipment to enhance operator safety during bridge construction, maintenance and repair. Enerpac tools and systems deliver solutions for reducing operational downtime and improving overall productivity. Enerpac products comply with international safety standards and make construction tasks safer, easier to perform and improve overall productivity.

We have been involved in numerous projects, delivering innovative solutions, on-site technical assistance and products for the most complex bridge construction applications.

With more than 50 years of experience, Enerpac has gained unique expertise in delivering hydraulic solutions for the controlled movement and positioning of heavy loads.

This expertise has been acknowledged by the world's leading industrial professionals and has contributed to the successful movement of a number of the most recognizable structures on earth.

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Replacing a Bridge Deck in the Antwerp Harbour with a Jack-up System

Customer: Roll-iT NV

Location: Antwerp, Belgium

Challenge: Roll-iT account & project manager Tom van Runckelen explained the company's approach. "Our biggest challenge was to lift the bridge over the Kattendijk lock and the historic lockkeeper's cottage / control tower of the London bridge. It was impractical to use a crane for this given the level of disruption to local traffic and services. Instead we decided to use the Enerpac Jack-Up to lift the bridge over the obstacles as required. It also had the advantage that we could use the jack-up as an integral part of the complete bridge transport and installation system."

Solution: The Enerpac's JS-Series Jack-Up system is a multi-point lifting system comprising four jack-up towers, one positioned under each corner of a load. The lifting frame of each jack-up tower contains four hydraulic cylinders, which lift and stack steel barrels. The load is lifted in increments as barrels are inserted via an automated system, lifted, and stacked, forming the lifting towers. The JS-250 has a lifting capacity of 250 ton per tower, giving a total lift capacity of 1000 ton, up to a height 10m.

Van Runckelen explained "Before the project started we were concerned about the stability of the jack-up at 7,5m, but we didn't have to worry. The jack-up was very stable and well within the lateral movement we'd allowed for the lift. It was also surprisingly quick. Raising and lowering the bridge deck was completed in a fraction of the time we'd expected."

Products: JS-250, Jack-Up System



SyncHoist Lifts and Positions Brisbane Riverwalk Concrete Girders



Customer: Universal Cranes

Location: Brisbane, Australia

Challenge: Building a 850m pedestrian riverwalk required pre-cast concrete girders weighing 385 tons to be lifted and positioned into place.

Solution: Universal Cranes mounted a crane on a 280 ton barge and attached a wirelessly controlled, diesel powered SyncHoist system under the crane's hook to install the concrete girders. The SyncHoist offers precision load maneuvering vertically and horizontally using one crane instead of needing multiple cranes. Using the SyncHoist technology Universal Cranes is able to safely control irregularly shaped and uneven loads weighing up to hundreds of tons, while reducing the risk of damage from oscillations of wire rope due to sudden crane starts and stops.

Products: SHS-Series, SyncHoist - High Precision Load Positioning System



Bridges and Infrastructure

Lowering and Leveling a Caisson Pier Box for New Johnson Street Bridge

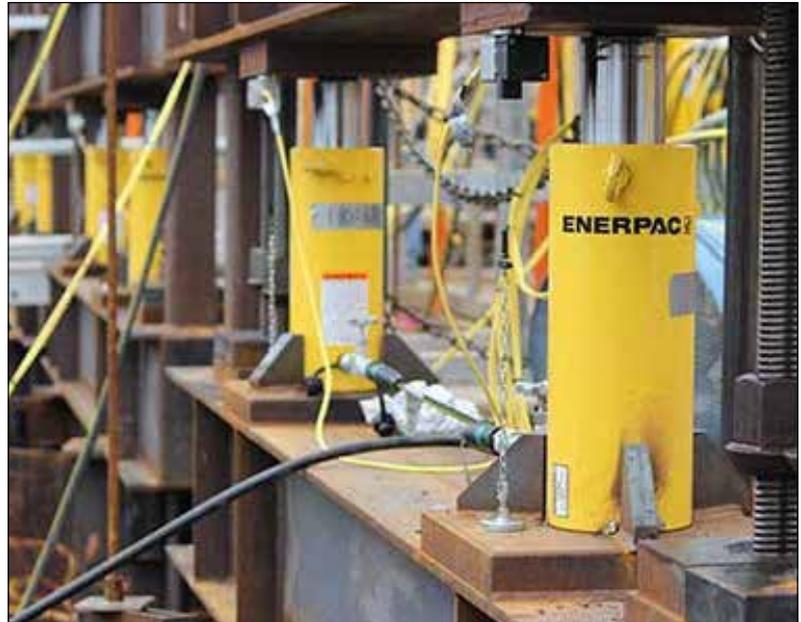
Customer: PCL Constructors Westcoast Inc.

Location: Victoria, British Columbia Canada

Challenge: The existing 90-year-old Johnson Street Bridge is located at the heart of Victoria, B.C. and is in the process of being replaced with a new bridge that will serve the community for the next 100 years. The new bridge is being built adjacent to the existing bridge, allowing the important transportation connection into Victoria's downtown to remain open during construction. The new bridge design includes a 25 meter long by 20 meter wide bascule pier box which will house the mechanical and electrical componentry for opening and closing the bridge span across the marine harbor. The 1100 ton bascule pier box is comprised of a steel and concrete caisson which needed to be lowered upon 16 large piers with tight precision.

Solution: PCL utilized a bar lowering method to evenly lower the caisson into its final position on the piers. Enerpac provided 32 CLSG high tonnage hydraulic cylinders and 3 EVO synchronous lifting systems. All three EVO systems were networked together which enabled a single operator to control all 32 points from a master control user interface. At each pier were two independently controlled hydraulic jacks providing precision lowering of the caisson.

Products: EVO-Series, Synchronous Lifting Systems
CLSG-Series, High Tonnage Cylinders



Jacking System Slides the Holbrook Canal into Position



Customer: Kiewit

Location: Rocky Ford, Colorado, U.S.A.

Challenge: Minimizing the amount of time state highway 266 was shut off to traffic was a primary objective during the reconstruction of the bridge structure over Holbrook Canal. Utilizing an innovative Accelerated Bridge Construction (ABC) method Kiewit, Jacobs Engineering and the Colorado Department of Transportation developed a plan to build the replacement bridge adjacent to the existing bridge. The new bridge was initially used as a detour while the deficient bridge was demolished. Once demolished, the new bridge was then closed to traffic and needed to be slid into the position of the original bridge.

Solution: A lateral bridge slide method was utilized to slide the new bridge into position. Enerpac provided a hydraulic solution capable of pushing the new 13,4 m bridge structure into position on PTFE sliding elements using a lateral-slide method. Enerpac supplied two RR-Series double acting hydraulic cylinders each with their own ZU-Series hydraulic pump and integrated pendant control. The pendant control allowed the operator to maintain individual control and a means of recovery from misalignment and wedging of the bridge structure between the abutments.

Products: RR-Series, Double-Acting Long Stroke Cylinders
ZU-Series, Electric Pump



Bridges and Infrastructure

Lowering a Bridge Span for the Demolition of the Kosciuszko Bridge

Customer: Bigge Crane and Rigging and Kiewit/Skanska Joint Venture

Location: New York, USA

Challenge: The Kosciuszko Bridge is actually two bridges that span Newtown Creek between the New York City boroughs of Brooklyn and Queens. Opened in 1939, the 1800 meter truss bridge is known locally as the Brooklyn-Queens Expressway. The bridge also is known as a notorious - and perhaps the worst - bridge for bottlenecks in New York City.

To increase traffic capacity, the aging truss bridge had to be replaced. The new, majestic cable-stayed bridge began accommodating two-way traffic in early 2017, and demolition of the old spans began in the summer of 2017.

Solution: Bigge Crane and Rigging was selected to supply the equipment to remove the largest span, which is 38 meter high, and over 90 meter in length. To safely meet the tight demolition schedule, the customer used 8 Enerpac 500 ton strand jacks to lower the span. The strand jacks feature a sophisticated, proven software program that enhances safety by synchronizing the motion of the strand jacks and adjusting the motion to the loads per lifting point.

Products: HSL-Series, Heavy Lifting Strand Jacks



Lifting 5 major bridges at the NATO Military Training Center



Customer: SBN Schachtbau Nordhausen

Location: Sachsen Anhalt, Germany

Challenge: At the new NATO Military Training Center in Sachsen Anhalt (North Germany) 5 bridges needed to be constructed. These bridges are designed especially for training in the military environment. The bridge decks had to be lifted and lowered, plus they had to be able to slide the bridge deck back and forth; simulating a destroyed bridge during battle. As part of their training troops will build a temporary bridge as part of their training.

Solution: Enerpac provided the perfect suitable solution to permanently install the five bridges by using 10 Lock Nut Cylinders of 50 ton, that were operated by a single computer controlled EVO-Series Synchronous Lifting System.

The hydraulic solution Enerpac offered enabled both horizontal and vertical movement to simulate a destroyed bridge.

Products: EVO-Series, Synchronous Lifting System
High Tonnage Lock Nut Cylinders



Pre-Loading Bridge Cables with a Battery Powered Hydraulic Pump

Customer: ALE Heavy Lift

Location: Erlangen, Germany

Challenge: ALE Heavy Lift was tasked with skidding an 800 ton railway bridge over a highway using skidding equipment and steel strands. The steel strands were used as diagonals within the skidding towers and as a connection in a longitudinal direction between the skidding supports. Before the bridge could be skidded onto the towers, more than 20 cable strands had to be pre-loaded to the same tension.

Solution: A hollow plunger hydraulic cylinder, and a battery powered XC-Series hydraulic pump was used to pre-load the cables. Due to the quantity and access restrictions of the cables, the battery powered pump provided an ideal solution; portable, fast and safe.

Products: XC-Series, Battery Pump
RCH-Series, Hollow Plunger Cylinder



Bridge Lift for Bearing Replacement



Customers: RMS

Location: Sydney, Australia

Challenge: Lifting a bridge to replace the old bearings under all 8 pillars.

Solution: A Synchronous Lifting System with ZE-Series pump was used to operate 6 Low Height Lock Nut cylinders in a safe and controlled manner. The relatively small set-up allowed the operators to install and move the system easily and quickly. Each of the 8 lifts was executed in only 15 minutes, resulting in a short road closure and reduced traffic delay.

Products: Synchronous Lifting System with ZE-Series Pump
Low Height Lock Nut Cylinders



Bridge Lift for Bearing Replacement

Customer: John Holland, Engineers of Aurecon, RTA

Location: Sydney, Australia

Challenge: Lifting and lowering a 200 ton bridge 560 mm to replace the worn bearings, with a special requirement for high lifting accuracy.

Solution: Installed 8 High Tonnage cylinders that were continuously controlled by an EVO-Series, Synchronous Lifting System. After lifting the bridge, the old bearings were taken out and replaced with new bearings. After the bearing placement, the bridge was lowered again on its new bearings. The accuracy during lifting was 1 mm across all cylinders.

Enerpac hand pumps were used together with hydraulic wedges to loosen the old bearings.

Products: EVO-Series, Synchronous Lifting System
High Tonnage Cylinders
P-Series, Steel Hand Pumps
WR-5, Hydraulic Wedges



Removing the Spans and Truss Section of the old Bay Bridge in Record Time



Customer: Burkhalter Rigging, Inc.

Location: San Francisco, California, USA

Challenge: The San Francisco–Oakland Bay Bridge has one of the longest spans in the United States. Demolition of the old eastern part of the bridge included the removal of 19 truss sections, weighing 800 Tons, stretching over 1,2 kilometers. At its highest point, the bridge is 36m above water level, with a progressive downward slope to the shore to 12 meters above the water. This meant that each span was at a decreasing angle as the segments reached the shoreline. Moreover, lifting would need to take account of tidal changes and wind/weather conditions.

Solution: Burkhalter used the Enerpac hydraulic Jack-Up System to lift each 85 meter bridge truss section. Given the length of each truss section, the four jack-up towers were deployed on a twin barge assembly to form a single floating platform, with two jack-up towers on each barge. The barge was floated in position under the segment and the jack-up towers raised. The west and east facing towers were each connected by a beam on which the truss would rest when lifted. Because of the angle of the segment, the west side towers were approximately 1m higher than the east side towers.

Products: JS-Series, Jack-Up System



Replacing Rail Bridge Decks with a Telescopic Hydraulic Gantry

Customer: Osprey Heavy Lift Ltd

Location: United Kingdom

Challenge: Timing is critical for rail construction projects to avoid unscheduled disruption to train and passenger services. However, the best project planning can be undermined by adverse weather conditions. High wind speed may prevent bridge deck lifting by using a crane, leading to project delays.

Solution: An Enerpac hydraulic gantry which comprises of 4 or more telescopic legs and an overhead beam, allowing vertical lifting of heavy loads. If movement of the load is required the complete gantry system and load can be traversed along a track. A wireless control system provides the operator an unobstructed view on the lift job and information about stroke and load per lifting leg. Moreover, the gantry lift is less affected by wind speeds than crane lifts.

The Enerpac gantry allows the new deck to be completely constructed on site at ground level, avoiding the need to work at height.

Products: SBL-900, Telescopic Hydraulic Gantry



Controlled Hydraulics helps to position a railway bridge



Customers: Victor Buyck Steel Construction

Location: Brussels, Belgium

Challenge: A new railway bridge in Brussels Schaerbeke was constructed on an adjacent site before being moved to its final position. The steel railway bridge with a length of 140 meters and a weight of over 1600 tons had to be slid across a number of existing tracks. Time was the challenge here; the railway bridge installation job had to be finished within 48 hours in order to limit rail traffic disruptions.

Solution: Enerpac supplied a custom made 'Synchronous Lifting System', which monitors and corrects the movement and forces during positioning. This system consisted of a total of 28 hydraulic cylinders all equipped with stroke sensors. These are connected to a PLC control panel, which displays real time data of the lifting job.

Products: EVO-Series, Synchronous Lifting System
High Tonnage Lock Nut Cylinders



Bridges and Infrastructure

Pushing the 4000 ton Millau Viaduct Bridge Deck out into Position

Customer: Eiffage

Location: Tarn valley, France

Challenge: Building a 245 metres high and 2460 metres long bridge over the Tarn river to reduce traffic through Millau city center, and relieve traffic on Autoroute du Soleil A6/A7.

Solution: Enerpac's technically advanced hydraulic launching system was designed to push the 27,35 m wide deck from both sides onto the bridge's seven concrete piers. During the launching process, the deck was supported by seven temporary metal piers.

The enormous, yet at the same time, "light" deck is pushed by means of hydraulic launching devices on each pier, which first lifts and then pushes the deck. An adjustable nose structure at the end of the deck, allows the deck to land on each pier as it approaches it.

Each launching system consists of a lifting cylinder, with a capacity of 250 ton, lifting the deck off the supporting structure of the pier, and two or four skates, each equipped with two 60 tons cylinders, which retract to launch the deck a maximum of 600 mm. All of this rests on a system of single-acting lock nut cylinders supporting both the launching device and the deck.

Products: High Tonnage Cylinders
PLC-Controlled Hydraulic System



Replacing Bridge Bearings without Interrupting Traffic



Customer: Cagil Construction

Location: Istanbul, Turkey

Challenge: The Sadabad Viaduct is a connecting motorway to the Second Bosphorus Bridge. Approximately 400 bearings needed to be replaced on the Sadabad Viaduct while the road remained continuously open to traffic.

Solution: Our customer utilized an 8 point Synchronous Lifting System and 20 low height lock nut cylinders to jack the deck sections and replace the 400 bearings. The cylinder's locknut mechanically supported the load while the bearings were replaced. The hydraulic system was equipped with a central control unit to synchronously lift and lower each deck section with a 2mm stroke tolerance. Both mechanical load holding and precise control during operations, allowed the highway to safely remain open to traffic throughout maintenance activities.

Products: EVO-Series, Synchronous Lifting System
Low Height Lock Nut Cylinders



Jack and Roll System Pulls the Fort Lyon Bridge into Position

Customer: Kiewit

Location: Colorado, U.S.A

Challenge: Minimizing the amount of time state highway 266 was shut off to traffic was a primary objective during the reconstruction of the Fort Lyon bridge structure. The customer built the replacement bridge adjacent to the existing bridge. The new bridge was initially used as a detour while the old bridge was demolished. The new bridge now needed to be moved into position of the original bridge.

Solution: Enerpac provided a hydraulic solution capable of pushing the new 13,5 meter bridge structure into position using a lateral slide method. Two double acting hydraulic cylinders, each with their own ZU-Series Hydraulic Pump and integrated pendant control, allowed the operator to maintain individual control and prevent misalignment and wedging of the bridge structure between the abutments. With this solution the customer completed the slide in 52 minutes, a full two hours ahead of schedule.

Products: RR-Series, Double-Acting Long Stroke Cylinders
RRH-Series, Hollow Plunger Cylinders
ZU4-Series, Portable Electric Pumps



Lifting and Installing the Deck Sections of the Golden Horn Metro Bridge



Customer: Gülermak

Location: Istanbul, Turkey

Challenge: The Golden Horn Metro Bridge is a 936 m long cable-stayed bridge, across the Golden Horn waterway in Istanbul. Portions of the bridge deck will rotate in order to permit large shipping vessels through the waterway. During construction, the rotating bridge deck segments were fabricated off-site and floated in on a barge. The 300 ton deck sections needed to be lifted off the barge nearly 17 meters and installed into position.

Solution: To lift the segments, 4 hydraulic strand jacks, each with a 200 ton lifting capacity, were installed on two temporary gantries. Custom made brackets were attached to lift the segments and, operating in unison, the strand jacks lifted the deck sections.

Products: HSL-Series, Strand Jacks
SLPP-Series, Hydraulic Power Packs



Bridges and Infrastructure

Jack-Up System Lifts 1500 ton Span on Fore River Bridge

Customer: Burkhalter

Location: Massachusetts, U.S.A

Challenge: For the construction of a steel vertical lift bridge, the off-site constructed 1500 ton lift span needed to be lifted 20 meters into place from barges under the bridge.

Solution: Enerpac provided a Jack-Up system, an incremental lifting system that typically includes four jack-up towers positioned under each corner of a load. The four-tower setup has a lifting capacity of 2,000 metric tons (500 metric tons per tower). The load is lifted in increments as steel boxes are inserted via an automated system, lifted, and stacked, forming the lifting towers.

Products: JS-Series, Jack-Up System



Safely Erecting a Bridge Over Water with a Hydraulic Driven Launching Nose



Customer: Downer and Jonel Hydraulics

Location: Ongarue River, New Zealand

Challenge: Construction of a new bridge as part of the KiwiRail project, to improve the country's main trunk rail network and allow more freight to be carried over the strengthened refurbished structure.

Solution: Custom-engineered steel bridge launching nose recovery system, constructed with Enerpac bolting equipment and driven by Enerpac hydraulic cylinders and pumps.

Products: RCH-Series, Hollow Plunger Cylinders
RC-Series, General Purpose Cylinders
Hydraulic Electric Pumps
ZU4T-Series, Electric Torque Wrench Pumps
S-Series, Hydraulic Torque Wrenches



Lifting the Songdo Cable-Stayed Bridge Pylons

Customer: DH

Location: Incheon, South Korea

Challenge: Lifting and positioning two 2000 ton cable-stayed bridge pylons into place. To prevent counterbalance issues, it was critical to erect both pylon sections simultaneously and within a very tight tolerance. Any counterbalance issues would have created a lopsided load and put undue stress on the center pillar.

The lack of a good footprint and the approximately 100 m lifting height made the lift almost impossible for two cranes. The need to lift from the central point of the structure required a high capacity lifting solution that could raise both sections simultaneously from a central point.

Solution: Four HSL8500 strand jacks were installed on top of a temporary bent tower and simultaneously lifted both pylons up to their permanent position at 75 degrees. The operator monitored and controlled the lift using a computer controlled strand jack system supplied by Enerpac. The whole process was completed in 2 days.

Products: HSL-Series, Heavy Lifting Strand Jacks
SLPP-Series, Hydraulic Power Packs



Bridge Construction by Crane with SyncHoist Segment Hoisting and Positioning



Customer: Ghidoni

Location: Bellinzona, Switzerland

Challenge: The steel bridge segment needed to be lifted over the river with a crane. Accurate leveling and positioning was required to bolt the segments together.

Solution: Using an Enerpac SyncHoist system, loads can be positioned with high accuracy using one crane. The PLC-controlled hydraulic system is mounted below-the-hook. With the 4-point SyncHoist System the steel segments were picked-up, moved and positioned.

Products: SHS-Series, SyncHoist System



Placing Bridge Girders with a SyncHoist System

Customer: Universal Cranes, Smithbridge

Location: New South Wales, Australia

Challenge: The Pacific Highway expansion project included hundreds of kilometers of new highway between Sydney and Brisbane. Part of this project was the construction of a new bridge over the Nambucca River.

The Nambucca River Bridge is 850 meters long and includes 21 bridge spans comprised of four precast concrete girders. Weighing up to 158 tons and 41 meters in length, each of the girders needed to be placed on bearings with precise control.

Solution: To save time and simplify the placement of the girders, the customer utilized a Synchronous Hoist System. Positioned below the lattice spreader, the SyncHoist System enabled adjustment of the beams during placement on the bearings.

The system also helped save up to half a day in downtime. The team only needed to adjust the slings, rather than changing the rigging gear.

Products: SHS-Series, SyncHoist System



Box Girder Launching System on the John Greenleaf Whittier Bridge



Customer: Walsh Construction

Location: Massachusetts, USA

Challenge: Constructed in 1951, the John Greenleaf Whittier Bridge needed to be replaced by a new bridge compliant with current safety standards. Walsh Construction employed a rail mounted crane system to simplify the placement of the steel bridge girders and precast deck. Two 182,8 cm tall, 292,6 m long temporary support steel box girders were launched across temporary piers to create a rail system for the crane to operate on during the approach span construction.

Solution: Enerpac worked with the customer to design a box girder launching system that would first clamp, then advance or retract the two separate box girders synchronously. The box girder launching system was mounted at various temporary pier locations as the gantry crane moves to each stage of approach span construction.

Products: RR-Series, Double-Acting Long Stroke Cylinders
SFP-Series, Electric Split Flow pumps



Bridges and Infrastructure

Arch span raise the profile of 'The Crossing' bridge with precision lifting and positioning

Customer: Bouwcombinatie Stadsbrug Nijmegen
Koninklijke BAM Groep and Max Bögl.

Location: Nijmegen, The Netherlands

Challenge: Raising the bridge structure arch span required precision lifting and positioning.

Solution: Enerpac provided a Strand Jack solution to lift and position the main span onto the structure of the bridge.

Products: HSL-Series, Heavy Lifting Strand Jacks



Installing Pylon Sections of a Cable-Stayed Bridge with a SyncHoist



Customer: FIRMA "Gotowski" Budownictwo
Komunikacyjne i Przemysłowe Sp. z o.o.

Location: Bydgoszcz, Poland

Challenge: The 200 meter long cablestayed "University Bridge" connects two parts of Bydgoszcz separated by the Brda River. The bridge's design requires the erection of two 68 meter tall pylons (towers) to support the bridge deck. Constructed in sections, the pylons weighed 90 to 130 tons and needed to be positioned with precise accuracy.

Solution: An Enerpac SyncHoist system was attached below the hook of a 350 ton crane. Comprising four specialized double acting push pull cylinders, the SyncHoist enabled a single operator to precisely mount each pylon section. Enhancing the capability of a single crane with a computer controlled hydraulic positioning system provided a safer and more precise solution than utilizing multiple cranes to install the pylon sections.

Products: SHS-Series, SyncHoist System



Jacking & Skidding a Tunnel Boring Machine for the Next Drilling Phase

Customer: Ekatama Group

Location: Jakarta, Indonesia

Challenge: In Jakarta, the capital city of Indonesia, broke ground on a mass rapid transit (MRT) system in hope to alleviate the city's traffic congestion. The rail-based MRT is expected to stretch across over 108 kilometers. A tunnel boring machine (TBM) is being used to construct the underground routes. One of the critical phases of the tunnel construction is the pass through, in which the TBM needs to be moved through the underground stations to be relocated to the next drilling position. The narrow composition of the underground stations requires a complex maneuver involving moving the 260 ton TBM sideways 1,47m, lifting 65 cm, pushing 200 m, lowering 65 cm and finally moving sideways again 1,47 m. Moving a heavy load with an uneven weight distribution as in the case of the TBM mandates a system with high precision. Lifting using a traditional method or manually, would not be efficient due the complexity of the job.

Solution: All movements were managed by one person. Stroke sensors at each lifting point produced real time updates and measured the load's displacement to ensure an accuracy of 1mm was maintained. Sliding the TBM was performed in three stages using two RR-Series double-acting hydraulic cylinders with a capacity of up to 150 tons. Lifting operations used four RR-Series 150 ton hydraulic cylinders. Pushing the TBM a distance of 200 m was performed with two 30 ton cylinders equipped with a custom self-locking mechanism that allowed the system to automatically position itself to its starting position and repeat the pushing cycle without manual intervention.

Products: EVO-Series, Synchronous Lifting System,
RR-Series, Hydraulic Cylinders,
ER-Series, Load Skates



Hydraulics Play Key Role in the Installation of Venice MOSE Caissons



Customer: Condotte Clodia and GLF

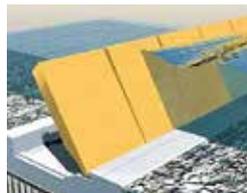
Location: Venice, Italy

Challenge: Over the last 100 years, the city of Venice has sunk 23 cm while sea levels have risen. In recent years the frequency and intensity of flooding has increased causing significant damage. The MOSE project is intended to protect the city from flooding.

The project includes the installation of multiple underwater caissons with mobile gates that can be raised to prevent water from the sea from entering the lagoon. Installing and connecting the 25.000 ton caissons on the ocean floor required a tremendous amount of force applied in a controlled manner.

Solution: Enerpac developed a dedicated damping and leveling control system with high tonnage cylinders fitted underneath the caissons in all four corners. When a caisson hits the seabed, tremendous forces could be generated if not properly damped. Enerpac cylinders and huge hydraulic accumulators were used to absorb these forces and make sure the caissons can be lowered onto the seabed in a safe and controlled fashion.

Products: Custom High Tonnage Cylinders,
Custom Pull Cylinders,
SFP-Series, Split Flow Pump



Hydraulic Jacking System Assists Construction of the Honolulu Rail Transit System

Customer: Kiewit

Location: Honolulu, Hawaii, USA

Challenge: In 2012, the Honolulu Rail Transit Project began the construction of a 20-mile elevated rail line. The rail system seeks to alleviate significant traffic issues affecting Hawaii's most congested city.

Solution: Enerpac engineered and delivered the hydraulic control package to Kiewit for the underslung girder systems. Each of the twin underslung girder systems are supported by pier brackets on each end which are transversely positioned and aligned with custom Enerpac TR-Series hydraulic tie rod cylinders. Once the steel box girders are launched and aligned on the pier brackets, custom Enerpac 150 ton lock nut cylinders are mechanically locked ensuring the system maintains its precise position.

The guideway segments are then picked via crane and placed onto a set of segment carts where they are supported by 50 ton Custom CLL-Series hydraulic lock nut cylinders. Utilizing the segment carts the segments are precisely aligned and maneuvered into position, where the segments can then be epoxied and post-tensioned together completing the span. Span-by-span advancement is enabling multiple phases of the project to occur simultaneously, thus helping to reduce the overall project timeline.

Products: Custom Enerpac Hydraulic Power Unit, Custom TR-Series Tie Rod Cylinders, Custom CLL-Series Lock Nut Cylinders, Custom Z-Class Hydraulic Pumps



Installation of Tidal Turbines on the Eastern Schelde Storm Surge Barrier



Customer: Huisman Equipment

Location: Schiedam, Vlissingen, Netherlands

Challenge: The Eastern Scheldt (Oosterscheldekering) is a series of dams and storm surge barriers protecting the Netherlands from flooding from the North Sea. Part of a renewable energy project included the installation of five tidal turbines on the storm surge barrier. Huisman Equipment was tasked with the construction of steel structure to mount the tidal turbines to the barrier. Installation of the Tidal Power Plant needed to be completed with precision and pace. Changes in the water levels and the tide required the entire installation be complete in a two hour window.

Solution: The 500 ton steel structure was floated on a barge to the storm surge barrier. Enerpac developed together with Huisman Equipment 4 custom 400 ton double-acting CLRG hydraulic cylinder with tilt saddles, these saddles were integrated into the steel mounting structure. During the positioning of the tidal turbines the cylinders applied a precise amount of tension in order to mount the structure securely on the storm surge barrier. The Tidal Power Plant was successfully mounted on the barrier and will be producing clean, hydro-electric power.

Products: Custom CLRG-Series, Hydraulic Cylinders, ZE-Series, Electric Pumps



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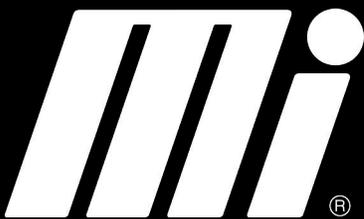
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Looking for specialized solutions for fluid power operations? Talk to the experts at Mi Fluid Power Solutions for expertise related to hydraulic power units, gearbox, and cylinder repair.

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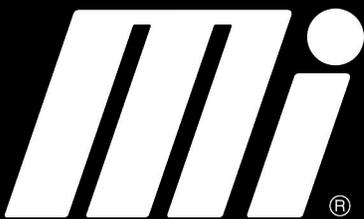
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