

# Drive & Control profile

## Tight Timeline Achieved with Offshore Crane featuring Active Heave Compensation



EBI Active Heave Compensated Crane aboard the Maridive 235 Offshore Support Vessel.

### History of Staying Afloat

Elevating Boats, LLC (EBI), ([www.ebi-inc.com](http://www.ebi-inc.com), Houma, LA) was started by twin brothers in 1949 when they came together to form a universal repair service that would “fix anything but the break of day and a broken heart” according to Ken Serigne, EBI’s CEO. After a job that involved straightening out spuds on a spud barge, the brothers devised the concept of an elevated barge. They combined the function of a jack up rig with an offshore supply vessel. By lowering the legs to the bottom of the seafloor and elevating the boat above the water to the level of the offshore

platform, they provided a stable platform for workers in the oil and gas industry in the Gulf of Mexico.

With hundreds of the platforms to service, there was no short supply of work, so they formed a new company simply called Elevating Boats, Inc. According to Serigne, “Today we operate 26 lift boats in the Gulf of Mexico and are the only designer, builder and operator of lift boats. Through the years we also found that we could sell gear boxes and offshore pedestal cranes.”

### Challenge:

Create offshore crane with Active Heave Compensation of the main winch under tight time constraints.

### Solution:

Custom-designed Hydraulic Drive for TC160 Active Heave Compensated Crane

### Results:

- Bosch Rexroth worked with EBI and the vendor, Scantrol, to successfully meet tight timeline set by client: project achieved in half the time typical for such applications
- First system for an active heave compensated crane engineered in the U.S. thanks to excellent Bosch Rexroth, EBI and Scantrol teamwork
- New opportunities for EBI to expand industries and operations



The Rexroth solution included two mobile A15VLO 280 pumps with high power density.

When a client came to EBI needing a telescopic box boom offshore crane with Active Heave Compensation of the main winch, EBI contracted Bosch Rexroth for the job.

### **Active Heave Compensation Winch Delivered in Record Time**

Not only was EBI's request the first Active Heave Compensation project of its kind in the U.S., but the client also had a tight turnaround with a completion timeline of just five months. Active Heave Compensation (AHC) was the preferred technology because of its ability to compensate for the relative motion between the ship and the sea bottom in offshore operations such as construction and diving support. AHC increases safety of offshore lifting operations by reducing the influence of waves on the load being lifted.

Bosch Rexroth's high dynamic winch drive system with speed and torque (constant tension) control of the main winch uses a dynamic open circuit hydraulic drive. Bosch Rexroth supplied the hydraulic power unit

components, accumulators, winch hydraulic motors, load holding manifolds, mobile control valve assembly and controller. A company out of Norway, Scantrol, provided the controls for Active Heave Compensation, allowing operators to handle speed and torque control based on a command signal from the Scantrol system. The project is the first system for an active heave compensated crane sold in the U.S. and marks an innovative development for both Bosch Rexroth and EBI.

### **Simple and Efficient**

According to Wim Boogert, Oil and Gas/Marine regional manager at Bosch Rexroth, "a lot of systems are complicated, but based on the timeline we had to come up with a more simplified system done with an open circuit drive concept." The team selected the Rexroth A15 VLO 280 pump, a mobile pump that was developed to replace the A11 pump with more flexible controls, high power density and less cost. Joe Sabbia, applications engineer for the Marine & Offshore industry at Bosch

Rexroth, states that the A15 is "more suited for mobile machines. This crane is driven by a diesel engine turning at 2200 rpm. Two 280cc pumps turning at that speed can produce a lot of flow in a small package."

In addition to the Rexroth A15 VLO 280 pump, Sabbia explained the benefits of the Rexroth M7 valve, a product that is commonly found on land or mobile cranes, but rarely used offshore. "The M7 is a mobile valve that is very well suited for the auxiliary functions on the crane like telescoping, luffing and slewing. It's a flow sharing valve, so it performs better than a load sensing system since simultaneously operating functions have less interaction. Startup went smoothly with the help of the mobile technicians who have experience implementing the M7."

### **Time and Budget**

The biggest challenge with the project wasn't technology, but time. "This is a case of an impressively fast accomplishment," states Sabbia. "Many companies requesting

similar technologies would want more than a year to cover their own development. We had to start with detailed engineering in the quotation phase. We had a good relationship, so EBI accepted the risk. Normally the system engineering alone would take six weeks. We had between one and two weeks to accomplish this. The entire project would normally take 10 months. We did it in five.”

According to Tony Scarselletti, controls engineer at Bosch Rexroth, along with an accelerated schedule, there was a limited budget to work within, as well. “We simply needed a crane that would work, do what it needs to do and do it quickly. EBI’s part was also on an accelerated schedule with a lot of educated guesses on the front end and modifications done on the commissioning and startup. Scantrol did the overall crane controls for the crane while we added single axis control for the winch motors.” The project involved multiple factions working simultaneously on their own and then combining to put it all together. “We did that on purpose to use everyone’s expertise so we could come together quickly”, says Scarselletti. “We supplied the single axis control for the main winch. We each had our own responsibilities to execute. The crane was constructed in Ponchatoula, Louisiana and then the team traveled to Singapore for installation and final commissioning on board the vessel.”

### **The Power of Teamwork**

The project was a learning curve for everyone involved. More common overseas, this was the first Active Heave Compensated crane for Bosch Rexroth U.S. It was a new area for



The completed crane, shown here on the EBI test stand, opens up new doors for potential sub-sea applications.

EBI to be in as well, a prototype for the company.

According to Ken Serigne of EBI, “this crane was the first active heave compensated crane commissioned here in the U.S. mounted on a diving vessel. It showcases a lot of our already proven concepts combined with some very sophisticated drive and control equipment. Bringing together the hydraulic and control

system is a good example of state-of-the-art electronic controls being used in existing hydraulic concepts to make them smarter. We were doing things that we thought were impossible. We were very pleased to work together with Bosch Rexroth and make a specialized product in such a short time frame.”

The teams solved multiple challenges at every stage. One came during the

initial commissioning. “There was a glaring problem that was discovered around 8 p.m.”, states Scarselletti of Bosch Rexroth. “We thought it would delay us for up to two days, but EBI technicians told us to be there at 8 a.m. the following day. They called their hose supplier at midnight and he produced what they needed on the spot. They pulled an all-nighter to make sure they’d be on schedule in the morning. It was not an easy task. That’s the kind of teamwork everybody had.”

Teamwork was essential in the success of this project, with Bosch Rexroth, EBI and Scantrol all joining forces together.

B.J. Brown, EBI systems design engineer adds, “Hats off to Tony and Andreas (Andreas Aasen, service technician at Bosch Rexroth). They were really great dealing with the timeline. They made it easy for someone like me who’s never designed a system like this. They even added a little bit of mentoring along the way. A lot of the manifolds had to be machined and air freighted overnight. Without the key components from Rexroth we couldn’t test anything, but they always had the components waiting, even around the Christmas and New Year holidays.”

As with any project, issues arose along the way, but coordination

among all parties allowed for a smooth process overall – ultimately meeting the needs of the customer.

### **Success Opens a New Door**

The crane was installed on the vessel in Singapore and then the vessel sailed to the Mediterranean to start working. The crane is supporting offshore construction and diving operations and is working well. EBI sees this success as being important to their oil and gas industry business, but also as a way to expand into other industries. Says Ken Serigne, “We would like to get into other industries and types of operations, and this crane opens a new door for us. We’ll put it on a variety of vessels worldwide and can use it to get into other types of construction projects on the water.”

**Do you have an application worthy of a case study?**

Contact Susan Strauss: 610-694-8352  
[susan.strauss@boschrexroth-us.com](mailto:susan.strauss@boschrexroth-us.com)

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