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Unique new packerhead system helps Coastal Pipeline Products meet market demands

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In late October 2012, Superstorm Sandy brought much of the East Coast to its knees with hurricane force winds, torrential rains and flooding storm surges. Sandy's economic impact could exceed \$70 billion according to recent estimates. One company in the storm's path that made it through relatively unscathed was Coastal Pipeline Products Corp. located in Calverton on the eastern end of Long Island, New York. While the 95,000 ton-per-year precaster's lights barely flickered in the storm, many of its 50 employees were not so lucky. "I live on the southern coast of Long Island and we were hit pretty hard," notes operations manager Don Raymond. "We lost power at my house for about six days, but many others were hit much worse. Many in this region lost everything." Today, the area continues to recover and rebuild. Coastal Pipeline and many other precasters in the area are beginning to fill orders for storm-related reconstruction projects and, at the same time, are experiencing an overall uptick in construction investments.

Change needed to stay competitive

Recently, Coastal took a major step to help it continue to grow and meet the needs of its predominately municipal and state DOT customers. "Even before the recession hit us, we were looking at a number of different options for upgrading or replacing our 12 to 36 inch diameter pipe production system," Raymond explains. The original Hydrotile packerhead system, installed when the plant opened its doors in 1988, served Coastal's needs very well until recently.

"Pipe is a relatively small, but critical part of our business," says Raymond. The firm began life as a pipe producer—hence the com-



Figure 2: Coastal Pipeline Products produces pipe from 12 to 72 inch inside diameter. Here, recently "tipped out" 15-inch pipe is laid out in preparation for yarding.



Figure 3: Here, 30-inch "green" pipe is placed in the curing area. A fabric curing tent will be deployed to control the curing process.



Figure 1: The 20-acre Coastal Pipeline Products facility features a 30,000 square foot main building housing all dry cast production as well as a portion of the wet cast operation. The majority of wet cast products are produced outside, except during inclement weather.

pany name—however it quickly realized that it needed to diversify its product catalog in order to compete in a highly competitive market, often against much larger firms. In addition to its original Hydrotile packerhead system, the firm also uses a Teksam vibratory pipe system to produce 42 to 72 inch pipe and a Prinzing vibratory system for dry cast manhole risers. "Our 'small' diameter pipe system was pretty worn out and it was starting to impact our quality, which is critical in our market. Every piece of pipe we make is inspected and certified. Nothing but the best is acceptable. Our in-plant rejection rate was rising and that was unacceptable."

Up to 20 % of Coastal's revenues are derived from the sale of reinforced concrete pipe (RCP). The bulk of its revenues come from a vast range of other precast products. The firm's 30,000 square foot main building (see figure 1) houses the dry cast pipe and manhole riser production areas, as well as a portion of the wet cast production

(i.e., most wet cast production is conducted outside, except during inclement weather) for manholes up to 120-inch inside diameter, drainage rings up to 12 feet in diameter, and a full line of catch basins, inlets, meter pits, box culverts, and custom products to 120,000 lbs per section. The firm is also licensed to produce StormTrap® storm-water detention/retention systems, and Contech Vortechs® hydrodynamic separator systems.

One-stop shopping provides added value

The capability to provide a full line of high quality RCP (see figures 2 & 3) in addition to its vast range of wet cast products enables Coastal to offer its customers one-stop shopping. "We are confident that our ability to sell a complete package of products gives us a competitive advantage," Raymond stresses. "Many suppliers won't fill an order if they can't fill up a truck. Even if a customer needs only a few pieces of pipe, we

e P a k

Electronic Direct-Drive Rollerhead redefines packerhead pipe production



Designed from the ground up, the ePak machine represents a major leap forward in packerhead production technology. At the center is the machine's revolutionary eDrive rollerhead drive system. Powered by two gearless 30-pole direct drive permanent magnet motors, for turning the inner and outer drive shafts, the eDrive develops much higher than conventional torques and has a wider torque/speed operating band - allowing precise packing control throughout the machine's entire production range.

Mechanically, the ePak's unique frame design permits the toptable, rollerhead drive unit, and bellpacker to continuously bear and smoothly travel on the machine frame, operating at speeds up to 25% faster than conventional frame designs. The machine also features a sophisticated synchronized four-shaft bellpacker to direct up to four times more vibration into the pallet for better bell compaction. It all adds up to making higher quality packerhead pipe - faster. Learn more about ePak. Contact us today!

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At HawkeyePedershaab we deliver more than machines.

We deliver solutions.



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Figure 4: The HawkeyePedershaab ePak RCP production system at Coastal Pipeline Products features PC- and PLC-based controls that continuously monitor and adjust all pipe production variables, including concrete feed rate, crosshead lift with variable speed, packerhead shaft torque, bell packer lift speed, top table control, turntable control and concrete feeder water spray. The automatic control system stores all mix recipes, machine settings for each pipe size, and production history record for every pipe produced. In this photo, the elevated bin on the platform directly in front of the operator is a 3-yard Concrete Feeder that holds the dry mix concrete coming from the mixer and feeds it at a precise rate as needed by the ePak packerhead system, seen just to the right of the Feeder.

can usually fill up that truck with other products the customer needs for the same or related job. That helps us be efficient and provide excellent, responsive service." Raymond and others at Coastal kept a close eye on the development of new packerhead and other pipe production technologies for about five years before the firm chose the path they would take into the future. "I attended the bauma show in Germany and stayed in touch with various innovators who were developing new types of systems. We determined that the cost to refurbish our old system would have been about 60 % of the cost of a new system. We didn't believe that rebuilding our old system offered us enough benefits going forward."

New packerhead system includes many industry firsts

In early 2012, Coastal agreed to be the first to install the new HawkeyePedershaab ePak pipe production system (see figure 4) as the replacement. "The ePak system is an entirely new type of packerhead design

that offers many unique features that can't be found on any other single machine on the market today," Raymond emphasizes. "We believe this system allows us to consistently and efficiently deliver the highest quality pipe possible. It also provides us with the greatest flexibility in configuration, control and speed."

The HawkeyePedershaab ePak 1200 system offers the following key features and advantages:

- Gearless electronic twin-motor eDrive (see figure 5) delivers precise power to dual counter-rotating drive shafts for maximum control of packerhead torque and speed. This new type of drive features permanent magnet motors that eliminate the conventional transmission and hydraulics found in most packerhead systems, reducing maintenance and electrical usage.
- Uniframe design of the ePak system (see figure 6) provides a rigid structure without the need for multiple support legs thereby providing a smaller machine footprint, including a smaller turntable, allowing for faster rotation speeds and greater production flexibility. Two-piece uniframe design allows easier installation in existing facilities.
- Synchronized four-shaft vibrating bell packer delivers up to 12 tons of impact force to ensure dense compaction of the pipe bell; self-cleaning design directs residual concrete to a single point for easier cleaning.
- PC- and PLC-based controls continuously monitor and adjust all pipe production variables, including concrete feed rate, crosshead lift with variable speed, packerhead shaft torque, bell packer lift speed, top table control, turntable control and concrete feeder water spray. The automatic control system stores all mix recipes, machine settings for each pipe size, and production history record for every pipe produced.
- Concrete Feeder provides a three-yard holding hopper, including hydraulic agitator, hydraulically controlled front gate for accurate control of mix flow, and a 24 inch wide troughed conveyor or belt with variable speed drive. The ePak Concrete Feeder is fed by conveyor from a two cubic yard Columbus Bin dry cast mixer.
- Compatibility with HawkeyePedershaab tooling as well as most other tooling from other manufacturers, including



Figure 5: The eDrive system found in the ePak packerhead pipe production system from HawkeyePedershaab features two gearless permanent-magnet electric motors (top section in photo above) that provide direct control of the packerhead torque and speed and help reduce maintenance and energy use. Dry mix concrete is fed into the pipe form by a troughed conveyor through the Top Table Assembly (at bottom of photo).

both single direction and bi-directional tooling (e.g., bi-directional tooling for smaller pipe sizes and single direction tooling for larger sizes), is helping Coastal save money.

"We weighed the risks of investing in a brand new system against the advantages of working with a strong, global supplier such as HawkeyePedershaab," Raymond says. "We knew they would stand behind their system and saw that the system was, at its core, a compilation of technologies that had been around for some years and therefore not completely unproven. While it required a leap of faith to some extent, it was a carefully calculated risk that is already paying off for us."

Coastal helps guide final ePak design

Raymond, a mechanical engineer and one of the first Coastal employees, worked closely with the design engineers at HawkeyePedershaab to fine tune the new ePak system design to meet the firm's needs. Because of the two-piece uniframe design, which essentially allows the main support tower to be assembled in modular pieces,



Figure 6: The new HawkeyePedershaab ePak packerhead pipe production system at Coastal Pipeline Products in Calverton, N.Y., is used to produce from 12 to 36 inch inside diameter dry cast pipe. The ePak system features a uniframe structure that eliminates the multiple support legs found on conventional systems, direct drive permanent magnetic motors provide gearless operation for greater torque and accuracy, and closed-loop PC-based controls.

Coastal was able to install the new system in its existing facility without major modifications to the building structure. In addition, the new system was able to use existing utilities such as air, water and the original system's 400-amp electrical service. "The first thing you notice when you walk into the plant and see the ePak (see figure 7) is the openness around the system and the turntable," Raymond observes. "That center leg that all other packerhead machines use that comes down in the center of the turntable is eliminated with the ePak. The open turntable makes it easier to set up and change forms, easier to maintain the system, and lets us optimize the space we have."

HawkeyePedershaab reports that the new ePak direct drive, using permanent magnet motors, develops much higher torque density and a wider torque/speed operating band than conventional geared transmissions. This system means the system permits rollerhead speeds as low as 90 rpm and uses up to 20 % less electricity. The direct drive also eliminates much of the rotating mass found in conventional packerhead systems, Raymond points out.

"We haven't used it long enough yet to know if our electrical bill has gone down; however, given that we're using the same electrical service as our old machine and getting far greater power and speed," Raymond notes. "I would say it is clearly more efficient and definitely more powerful than our old packerhead system. The elimination of all the gears and a reduction in the rotating mass that other machines use makes the system far more controllable and responsive. Everything this machine does is so fast and precise; it's a little scary when you first see it operate."

He continues, "The ePak designers have optimized every aspect of the pipe production cycle, from the time it takes to rotate the turntable to the time it takes to lower the packerhead tools to the bottom of the form. Seconds have been shaved from every step and they all add up by the end of the production shift. We're using our old forms and tooling, but achieving higher product quality and producing pipe at a higher rate than ever before."

Increased strength offers advantages

According to Raymond, three-edge bearing tests on pipe produced with the ePak system show a 10 % increase in strength with no changes in mix design. Coastal maintains a New York State DOT-approved laboratory with two full-time quality control staff. He notes, "The ePak system's more powerful and uniformly accurate compaction is not only producing better looking pipe, but also greater strength. That gives us the option to potentially reduce costs by adjusting our mix design to reduce cement use." Coastal is able to fill its pipe orders in less time and with fewer in-plant rejections. In fact, the plant has been able to run virtually rejection free for weeks at a time. "We're getting our work done sooner and more efficiently, which gives us time to prepare for our next project, whether it's running the ePak again the next day or another system. We've been able to eliminate the overtime we used to have with the old packerhead system."

The new controls that came with the ePak system provides Raymond and his staff with far greater control over every aspect of pipe production. "I've always maintained that producing quality dry cast products takes the right technology and little bit of magic," Raymond says. "Where our old packerhead system was far more sensitive



Figure 7: The uniframe ePak main tower eliminates the support legs found on most packerhead pipe production systems, allowing the use of a smaller turntable and free access to molds and other system components. At left, the ePak control PC is Windows based for intuitive operation of the entire pipe production cycle.

to any variation in speed, mix changes, and other factors, the ePak is far more forgiving and accurate.

"This was a major investment for us at a time when even much larger companies are holding back on new equipment," he notes. "It's not unusual to walk into a plant and find equipment that's 50 years old and still being used. We think differently and we believe that by investing in a state-of-the-art system now puts us in a better position to remain competitive for the next 20 years."

FURTHER INFORMATION



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