
# WIRE ROPE EXCHANGE

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# MAKING OF THE Machine

In an industry where competition drives innovation, companies are starting to incorporate the need for heft along with the growing demand for smarter and more technologically advanced machinery. A prime example is now sitting down in Houston – all 3.3 million pounds of it.





In 2006, Bishop Lifting Products, Inc. moved its Houston headquarters into a new 108,000 square foot, 13 acre facility as a part of its initial expansion. Plans were underway to add new spooling, swaging and proof testing equipment in Houston and other future branches. David Bishop began conceptualizing the large capacity proof tester in 2007, shortly after settling into the new facility with adequate space to make the dream a real possibility. After months of brain-storming and planning meetings, it was decided that 3.3 million pounds of capacity, 328 feet of length, a mechanically propelled take-up trolley, and the ability to horizontally pull spreader bars was the solution.

Bishop partnered with Chant Engineering of New Britain, PA on the design and fabrication criteria. Bishop Lifting had previously purchased several 225,000 and 100,000 pound Chant proof test machines and figured it would be more economically feasible to have Chant build the pulling heads, motorized trolley, cylinders and electronics, and BLP build the bed structure, legs, sub structure, and dead man. David Bishop described the decision to partner with Chant as 'simple' and noted that "they are a good engineering firm with a good track record. They came down here frequently and there was a lot of good communication." Phil Chant, Vice President at Chant Engineering, described the partnership as "surprisingly smooth [and] no different than being in the room next door" considering the distance and magnitude of this project. "It felt like a team from the beginning, and that we were an extension of each other's business. Everyone embraced the idea that we were working on something that had never been done before" recalls Chant. He further describes the partnership as encouraging that BLP was "investing in ideas and technology that might cost more upfront but will ultimately provide a significant return." After eight weeks of waiting on permits, planning with Tellepsen Builders, and building structural components in their own fabrication shop, ground was broken in late January 2010.



**Chant engineered the adjustable crosshead (pictured) to crawl down the frame while under load.**

The performance specifications were the first variables defined on the project. As David Moseley, Vice President of Marketing for Bishop Lifting Products described, "We needed a proof test machine big enough to proof test the largest Slingmax® Twin-Paths® and Gator-Laid® slings we regularly fabricate. We also wanted to compete for large crane & oilfield blocks, spreader bars and oilfield equipment. To do this, a multifunction test bed was needed." The machine's capabilities include traditional load, proof cycle and break testing to 275 feet at the full capacity of 1500 metric tons. The second feature of the multifunction machine is the ability to test spreader bars. This feature is unique in that it utilizes the same 750 metric ton cylinders to test the spreader bars in tension. Finally, the machine needed to be able to take up slack on longer synthetic slings. On long test beds with long test specimens, the slack must be taken up before the test load can be applied. This is difficult on large, high load specimens. If the operator does not take the slack out, then he can run out of cylinder stroke on the main loading rams. As Phil Chant explains, "basically on a 'normal' machine, the adjustable crosshead is rolled by hand or pulled by a fork truck to move it into position and the operator then manually pins it into place. On some large machines, the crosshead is powered, but [we've] taken it to the next level." On the new Bishop machine this is no longer a problem. Chant engineered the adjustable crosshead to crawl down the frame while under load. The crosshead is made-up of two pieces that are attached by hydraulic cylinders. Each piece of the crosshead has hydraulically operated pins that will find the pin holes in the frame automatically. Chant concludes that "this is a safe, quick method of test specimen set-up and slack removal that allows the main loading cylinders to be a reasonable length while giving the machine the versatility to test long specimens and specimens with high elongation."

Moseley describes the technology features of the test bed "like your piloting the Starship Enterprise rather than a hydraulic proof test machine." The touch screen monitor puts all the controls of the proof test machine at your finger tips. The software is InfoChip Version 5 and Chant machine operational software which automatically controls the functions of the test bed and uploads the completed test certificate in real time for the customer to review online. Two cameras with pan, tilt and zoom are used and can be focused on each end of the load during the testing procedure while video is continuously recording and photo stills can be captured when needed.

Key safety features were also incorporated into the design. The motorized trolley has pin alignment and engagement sensors that are controlled from the control room or on the ground via a wireless remote control. Both ends of the proof tester have fixed main pins with top removing positive locking plates. Warning alarms and flashing beacons are automatically activated when a load of 10% is applied. Another safety feature is the location of the control room. The control room is positioned on the second floor of the adjacent building, and is clad in quarter-inch steel plated walls and half-inch steel plated flooring. The viewing bay window is bullet proof acrylic, while debris walls are positioned at either end of the test bed. Needless to say, this is more than just a big machine, this is an all-inclusive specifically engineered and fabricated like no other in the world. "This new proof test machine will allow us to expand our BLP Services division into new markets… as we are now capable of testing high capacity Slingmax® Slings, UHMWPE rope slings, spreader bars and lifting beams, oilfield drilling blocks and crane blocks" explains Moseley.

But building a machine of this caliber is not without certain challenges. Chant recalls two big obstacles from the beginning – one involving physical implementation and the

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*– David Bishop, CEO of Bishop Lifting Products*


**Phil Chant standing next to the 3.3 Million pound Test Bed**

## "BLP WAS INVESTING IN IDEAS AND TECHNOLOGY THAT MIGHT COST SLIGHTLY MORE UPFRONT, BUT ULTIMATELY PROVIDE A SIGNIFICANT RETURN."

*-Phil Chant, Vice President at Chant Engineering.*

Left to right: Jeff Bishop, Phil Chant and David Bishop stand inside the 2nd story control room

2800 yards of concrete used for slab, piers, beams, and laydown yard

From the cover, the team that made the 1500MT Machine a reality. From left to Right (Randy Brown, Mike Davenport, Harold King, Jeff Bishop, Phil Chant, David Bishop)

other theoretical. Just as Bishop couldn't begin this project until the infrastructure and facilities could support it, Chant noted that the geography itself played a large part in how it developed. "The sandy soils in Texas presented a different challenge compared to other parts of the U.S. when you consider the sheer weight of this structure" Chant explained. While the engineering was not unlike smaller machines built previously, extra attention was given to dirt work and long pilings were used for additional ground support efforts. Another challenge posed was the practicality of taking a long 'wish list' of items and honing it down to just a few. While the team of Bishop and Chant was very open to new technologies and ideas, the process of figuring out how to engineer something that's never been done before and managing the inevitable field issues of actual fabrication and construction that happen all the time on-site was by far the biggest challenge recalled Chant. Bishop also added that the timeframe to completion presented a compounding challenge as well. "Once construction began, the mentality was to just get it done" said Bishop. Construction was completed in just five months which required constant work on the project in addition to a heavy workload of regular activity. Bishop brought in outside help as needed with welding and fabrication and considers five months "pretty quick when you consider the magnitude of what was going on both with the engineering requirements and our normal day-to-day operations."

The fact that this machine was taken from a clean-sheet design concept to what is now a finished product for immediate use doesn't represent the biggest challenge but the biggest success. As it turns out, the machine was completed in perfect timing in early June, 2010, as it has been put to heavy use already with the oil spill in the Gulf. BLP's Moseley states that "we utilized the proof test machine on large Twin-Path® slings, UHMWPE Rope slings, and mooring lines made for the Gulf of Mexico oil spill recovery project" and Bishop proudly adds that "overall, it has been a difference maker [in that] 98% of all the testing previously done outside now is not leaving the building." Bishop Lifting Products is hosting an open house on November 16, 2010 to coincide with a Crosby Group seminar and shrimp boil. They will be doing demonstrations of their new Chant proof test machine for all invited guests – you can't miss it – it's the big machine next to the newly poured acre of concrete lay down area. ❙