



# Line of sight

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**Speeding up pipeline production without compromising quality**



In an ever-changing world, the pipeline industry has certainly seen its fair share of changes – especially over the past 10 years. With a younger generation moving into the workforce, the introduction of new technologies resulting in new processes is almost a daily occurrence.

Coupled with the ever-increasing demand for improvements to all aspects of the construction process, companies look for every opportunity to implement changes that shorten the construction process without compromising safety or quality. Embracing this challenge, Mathey Dearman and Hypertherm Inc. stepped up to the plate to deliver powerful solutions.

First, Hypertherm developed what would become the Freedom 38 PPA plasma system, which was used in construction of the Seaway 2 pipeline.

## TO THE SEA

Heading north out of Oklahoma City, skyscrapers give way to strip malls, strip malls to a building here and there, and occasional buildings

to farm land. As far as the eye can see, cows and the occasional clump of trees dot the landscape. Woven through it all are dirt roads in a seemingly perfect grid and electric fences to keep the cows from wandering too far astray.

In this spot, an hour's drive north, one can almost imagine a tornado chaser with sophisticated storm tracking equipment zooming by.

But instead, one day full-size trucks headed to a relatively narrow strip of land that stretches hundreds of miles from the largest oil storage facility in the world, just north in Cushing, Okla., to the Gulf of Mexico. Eventually, the trucks found their way to the Seaway 2 – a twin to the 500-mile Seaway pipeline in service since 1976.

Here, dozens of men and a handful of women were laying out pipe, welding it together and then carefully moving it into a trench. Like the original Seaway pipeline, the Seaway 2 pipes are 30 in. dia. with walls up to 3/4 in. thick. The pipe is heavy thanks to the use of high-strength carbon



Mathey Dearman's CNC saddle machine being used with Hypertherm's Freedom 38 PPA on pipe.

Hypertherm's Freedom 38 PPA allows cuts with just the right amount of bevel so a welder can come in and properly join pipe.





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steel designed to resist corrosion and provide decades of service. As when working on any line, there isn't room for error. Hit a power line and one will lose their job. Get between the pipe and the trench and one could lose their life.

The men and women working the Seaway 2 pipeline were testing a prototype unit from Hypertherm Inc. designed to bring plasma arc cutting and gouging onto the line. The unit being tested on the Seaway 2 contained a 28-kW, 240-V generator, along with a built-in air compressor, and a Powermax85 air plasma unit capable of cutting 1-in.-thick metal at 20 ipm. It had a fairly compact 54-in.-by-44-in. footprint, allowing it to easily fit on the small buggies that move along the line.

On the Seaway 2 pipeline, the plasma unit was used for a number of tasks, beginning with welder testing and pipe fabrication at the yard, before being moved onto the line itself where the crew used it to cut pipe to size and gouge out welds needing repair. Prior to the arrival of the unit,

the crew members had to use three different processes to do that work: oxyfuel, air carbon arc gouging and grinding.

In addition to fewer processes, the quality of the cuts was improved with the unit. The cuts needed to be formed with just the right amount of bevel so a welder could come in and properly join the pipe to the line. The Powermax made more accurate and smoother cuts prompting Dusty Syrett, a welder with about a dozen years of experience on pipelines like the Seaway, to call it the best thing since peanut butter.

Endorsements like that prompted Hypertherm to move forward with production of the unit. The company made a couple of changes based on feedback from the field tests on the Seaway 2 pipeline. Instead of a 28-kW generator, the company increased the generator size to 38 kW and coupled it with a 125-amp Powermax versus the 85-amp unit. The changes meant workers would have the ability to cut slightly thicker 1-in. walled pipe without sacrificing cut speed ▶



or quality. Hypertherm released the product as the Freedom 38 PPA.

## SADDLE UP

To further advance their capabilities, pipeline construction crews can bolt on the Mathey Dearman portable CNC cutting system and complete high-quality complex pipe cuts within a matter of minutes in the field. Utilizing proprietary software, the CNC interface allows any operator to program complex cuts in a matter of seconds. The built-in database allows common cuts or projects to be saved for quick retrieval and less setup time.

The portable cutting system was also a great solution for Hill Mfg. Inc. in Broken Arrow, Okla., specifically its fabrication of manifolds used for a variety of applications in the oil and gas industry.

The company met with Mathey Dearman to discuss the impact that the Mathey CNC saddle machines could make on the cost of fabricating the contour holes and fish saddle cuts in the manifolds in-house without the need for outsourcing. Hill Mfg.

was outsourcing all of the contour holes and fish saddle cuts to a local fabrication shop that specialized in CNC laser cutting.

After meeting and seeing a demonstration of the CNC saddle machine, several machines were purchased and a one month analysis revealed the total savings on one project for 77 manifolds was \$21,560. The non-tangible time savings included purchased product lead time and associated reduction of lead times for manifold delivery to customers.

“We used to outsource all of the components and have them sent in to be put together like a puzzle,” says Scott Nuessen, production manager for Hill Mfg. responsible for overseeing the fabrication of the manifolds. “The Mathey CNC machines allowed us to perform most saddle holes and fish saddle cuts without having to buy a CNC pipe profile machine costing hundreds of thousands of dollars.”

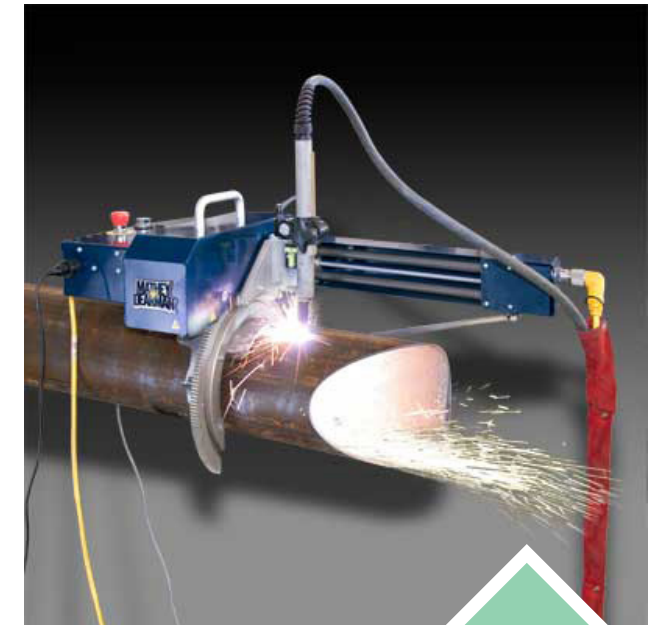
The machines are not “million dollar profile machines,” which means they

do have some limitations, but Hill Mfg. bought additional CNC saddle machines to help it continue saving money and provide customers with high-quality workmanship in a shorter amount of time. The bottom line is the company liked the CNC saddle machines because they paid for themselves after only one use.

Three models work on a range of pipe diameters from 1.5 in. to 12 in. The compact design and lightweight high-strength aluminum construction means the CNC saddle machine can easily be installed and operated by one person. This one system can replace literally thousands of saddle templates, contour templates and paper patterns.

Using the CNC saddle machine with the Hypertherm Freedom 38 PPA, plasma cutting is automated, which dramatically speeds cutting and reduces or eliminates grinding. Trial-and-error, manual fit-up is a thing of the past along with its wasted time and materials.

Change is not always for the best, but in some cases it makes perfect sense.



Mathey Dearman's CNC saddle machines can perform most saddle holes and fish saddle cuts.

Companies that are able to see the value new technologies can bring to their operations, and then adapt, will ultimately benefit the industry as a whole. Cutting without limits is now a reality thanks to Hypertherm and Mathey Dearman. ■

HILL MFG. INC.

HYPERTHERM INC.

MATHEY DEARMAN