When it was time to upgrade its plate rolling capabilities with a new machine, LMG chose the Davi MCE e-Power fully electric plate rolling machine. *Images: LMG*

LMG'S ELECTRIC ROLL UPGRADE

Canadian tank and pressure vessel fabricator improves repeatability with new machine

By Robert Colman

When working in a just-in-time manufacturing environment, it's important that every machine operates as efficiently and precisely as possible. Highly skilled operators are essential, but a more precise machine in the hands of a skilled operator is just that much faster. Lee Gottschlich, owner and founder of Alberta, Canada-based Leading Manufacturing Group (LMG), understands this. So when he saw the benefits that could come from investing in an all-electric plate rolling machine, he jumped at the opportunity.

INDUSTRY DEPTH

Gottschlich founded LMG in 2010, two years after selling his former fabrication company.

"Retirement wasn't for me," he said. "I just had to go back to work. I was beside myself."

Gottschlich has been in the industry for more than 60 years—49 of those spent running his own companies.

"I started out with Chicago Bridge and Iron, who were the premier storage tank builders in the world," he said. "That experience taught me a lot. I thought, 'If they can do it, I can do it.' I opened my first storage tank company after seven years working with them."

With facilities in Nisku and Vermilion, Alberta, and Battleford, Saskatchewan, LMG specializes in building steel storage tanks, pressure vessels, pressure piping, and tank accessories for markets in Canada and the U.S.

STRATEGIC OPERATIONS

Gottschlich is strategic in all he does; each facility was chosen purposefully.

Nisku is where the steel coils are leveled and cut to length by the steel service companies. The plate then is processed on LMG's 11- by 55-ft. high-definition plasma table. The plant also is the hub for the company's administrative, drafting/engineering, procurement, and IT departments.

"Edmonton is a strong fabrication center in Canada," Gottschlich explained. "Not only can we draw from a skilled base of potential employees in the area, but we also have access to the technical expertise of major suppliers like Linde and Lincoln Electric." It also means that no materials sit idly in either of the two fabrication facilities. Material is shipped to meet a schedule.

The Vermilion and Battleford plants are where all other fabrication and assembly happen.

The Vermilion facility is a 53,000-sq.-ft. fabrication site capable of building tanks up to 23 ft. 6 in. in diameter and more than 50 ft. tall in a quality-controlled indoor environment. The facility features several overhead cranes with 50 ft. under the hook and yard cranes with capacities up to 100 tons.

In addition to fabrication, Vermilion houses a finishing shop equipped with a 50- by 75-ft. blast bay, a 50- by 50-ft. insulation bay, and a 55- by 75-ft. paint bay. The company emphasizes environmental responsibility by recycling blast medium, avoiding silica blast products, and using 100 per cent solids and low-VOC coatings whenever possible.

Designed similarly to its Vermilion facility, the Battleford site features larger capacity in its blast and paint and insulation bays, as well as widened doors for indoor construction of tanks up to 35 ft. in diameter, taking advantage of Saskatchewan's wider load shipping regulations.

"In Saskatchewan, we can ship tanks that are 36 ft. in diameter from the shop," said Gottschlich. "Unlike other provinces, we can move these larger tanks across the province, if they stay in Saskatchewan. For our oil industry customers in the province, this is a great benefit." Building the tanks completely on-site, rather than in pieces that must be completed in the field, makes for greater efficiency and a better employee work environment.

"We set a high bar for our production," said Gottschlich. "We are set up so that you can't tell which facility our tanks are built in—the quality remains high wherever they are built."

With its substantial capacity under the crane in both its Vermilion and Battleford fabrication shops, LMG can produce very large tanks completely indoors—a critical consideration in fierce Alberta and Saskatchewan winters.

HEALTH AND SAFETY FIRST

Health and safety are key considerations for LMG. Machine investments in part reflect that. By necessity, materials are moved by overhead crane. The company uses submerged arc welding to do much of the welding work. No ladders are used in the facilities—any work that needs to be done at a considerable height uses a lift platform.

Most importantly, perhaps, is that the fabrication facilities are large enough that all work can be done inside—essential in a part of the country where temperatures can dip well below zero in winter.

"And every facility is very clean," said Gottschlich.

The right environment encourages employees to stay. Gottschlich has many employees who have worked for him for many years.

"When people do leave, I don't discourage it," he said. "I say, 'Go, get experience elsewhere.' Almost 10 times out of 10 they come back, but they come back with new ideas, knowledge they've gained elsewhere."

Gottschlich believes in investing in the future.

"I tell my team, 'If there's a machine that you see and think that if we bought it, we could do better, let me know,'" he said.

But people are the key to the whole business.

"You can have the best equipment, the best facilities, but if you don't have the people to run it, forget it," he said. "If you don't have a person to run that new machine, that thing's not going to make any money.

"But the better the equipment is, it makes your operators' lives easier," Gottschlich continued.

PLATE ROLLING PRECISION

Plate rolling is at the heart of LMG's work. As Gottschlich points out, plate rollers may not run all day in either of LMG's fabricating facilities, but they do run every day. Given that both facilities run seven days a week, they are key pieces of equipment.

When it was time to upgrade the company's plate rolling capabilities with a new machine, Gottschlich decided to attend FABTECH Chicago himself to see what was available. While there, he was introduced to the Davi MCE e-Power electric plate rolling machine. Seeing its capabilities, he determined it was the upgrade his shop needed.

Electric plate rolling machines have been around for a few years, but they were generally hybrid machines—electric motors handled plate rotation and hydraulics powered forming. It was an improvement over fully hydraulic machines because the hydraulics on the hybrid machines could be dedicated solely to forming, not rotating the material.

On the MCE e-Power electric machine, every axis is controlled by electrical inverters. According to Davi, it can deliver a positioning accuracy of 0.05 in., compared to the typical 0.1 in. for standard machines. Because it is not limited by a finite reservoir of hydraulic fluid, the machine can deliver rotation and forming movements smoothly and with consistent power, which is helpful in creating complex shapes of various radii.

Moreover, the electric rolls only draw power when a function is activated, unlike hydraulic rolls, which constantly draw power to the pump.

LMG's new plate rolling machine handles ⅞-in.-thick, 10-ft. plate.

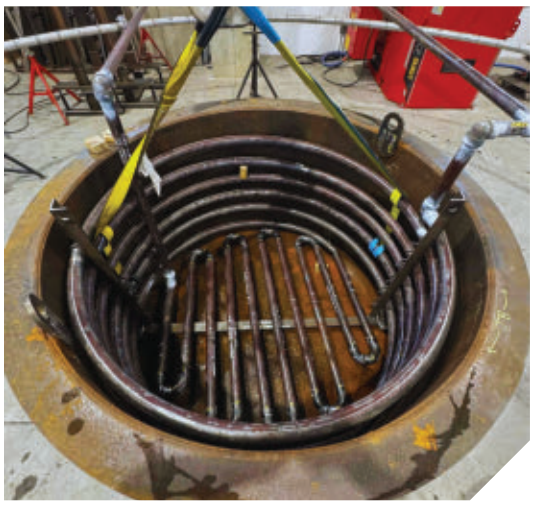
"We do some odd-shaped rolling, and those parts come out perfect to fit, every one, every time," said Gottschlich. "The use of actuators allows you to get such accuracy.

"The technology attached to it is good for our younger tradespeople as well," he continued. "They don't have the same intuition on the hydraulic plate rolls as older operators who know how to adapt to what is required of those machines. The all-electric plate roll takes all the guesswork out of the process. Younger people are used to working on computers, so they adapt to this technology quickly. You just punch in the code for what you want to roll, and the machine does the work. It can store a lot of programs, and it does it perfectly for you every time."

LMG rolls about 90 per cent carbon steel (everything from 38W to A516 Grade 70) and about 10 per cent stainless. The Davi machine is equipped with an oversized top roll to ensure that plates don't end up with too much of a camber.

"We are essentially rolling one part of a cylinder that might require nine plates to achieve its diameter," Gottschlich explained.

In the two months the new plate roll has been in the shop, it has made a big difference.



The company also took delivery of a set of MCP 11 hydraulic angle roll machines. The hydraulic angle rollers give LMG a whole new list of capabilities. The factory dies on the machines can be manipulated and rearranged to roll a variety of structural steel up to 4- by ⅜-in. angle iron (leg in or out), channel, flat bar, and tubing.

"You cut your time down so much—it's labor-saving and time-saving," he said. "Time is so important in those shops. With this rolling machine, you pull up the program and run without resetting the machine every time and guessing where you're going to be with a sweep check. You're getting it right every time. We got up and running on the machine very quickly, and any time we need assistance, it was a quick call to the Davi service technician in Texas to sort it out."

Gottschlich is all about relationships. As he admitted, he liked the team he met at Davi, he knew the company had a long history, and he was impressed by the technology they showed him. Not only did he purchase the all-electric machine, he also took delivery of a set of MCP 11 hydraulic angle roll machines that he saw demonstrated through the company's distributor in Alberta.

The hydraulic angle rollers give LMG a whole new list of capabilities. The factory dies on the machines can be manipulated and rearranged to roll a variety of structural steel up to 4- by ⅜-in. angle iron (leg in or out), channel, flat bar, and tubing. LMG also has acquired three sets of pipe dies to fit the machine, which allows them to roll 1.5-, 2-, and 3-in. Sch. 80 pipe to any diameter. Items that would typically be farmed out in the past can now be done in house to serve the company's needs, and those of any customers.

Now Gottschlich is awaiting delivery of an additional 4-ft. all-electric plate rolling machine from the company, which will form oval manways and other non-standard parts.

"That's going to make a huge difference on particular projects we have," he said.

Asked what's next, Gottschlich noted that he'll be looking at LMG's cutting practices, as well as how he can bring more automation, robotics, and laser cutting into the company's fabrication shops.

"A few of our fabrication team will go to FABTECH this year to see what makes sense for our team," he said. "I like to be number one. I don't think there's another company in Western Canada that has our capabilities, and I want to keep that leadership intact." **FAB**

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