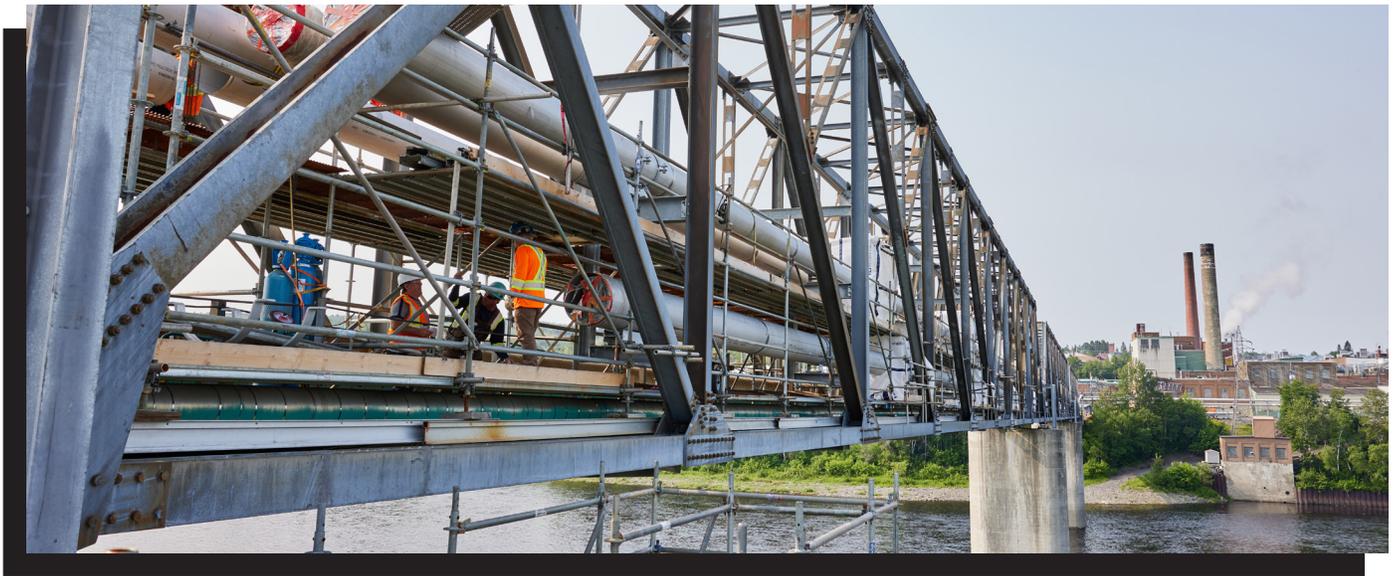


SUCCESSFUL CROSSING

ACTIV8X[®] PIPE[™] BRINGS STT SOLUTION TO REMOTE U.S.-CANADA PIPELINE



Edmundston-Madawaska Bridge connecting United States and Canada

In late 2022, a Canadian industrial contractor took on the task of constructing a pipeline to transport paper pulp across the U.S.-Canada border. Pulp and paper manufacturing in North America, like industry anywhere, relies heavily on the timely and efficient transport of raw materials, and the ability to put those materials together effectively. When considering various scenarios of doing that, the company's existing GTAW (TIG) process had been a viable option for a root pass on pipe, but they set their sights on something better – Lincoln Electric's STT solution, which offered a faster, less labor-intensive, and more cost-effective option.

International partnership

Sunny Corner Enterprises Inc (SCEI) is a multi-trade construction and maintenance contractor located in Miramichi, New Brunswick, Canada. Founded in 1965, SCEI does turnkey projects for a variety of industrial customers – mostly in

eastern Canada, with additional operations that reach into northern United States.

Among SCEI's customers is this U.S.-based paper mill headquartered in northern Maine, with operations on both sides of the U.S.-Canada border. The mill produces paper pulp at its Edmundston, NB, location and transports it across the St. John River to the company's Madawaska, Maine, operation via four separate sections – 900 feet each – of stainless steel pipe spanning the Edmundston-Madawaska Bridge.

Welding of the pipeline is done in two places. The initial assembly takes place at SCEI's fabrication shop about 155 miles (250 km) from the bridge itself, on the other side of New Brunswick. The pipe lengths are then transported by truck to the bridge, where the final assembly takes place.

"We're running four stainless steel lines," says Bill Schenkels,



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Alvin Sonier, site manager with Bill Schenkels, VP Business Development & Technical Sales at Sunny Corner Enterprises

Vice President of Business Development at SCEI. “Three are 20-inch lines and one is 24 inches. So they’re big welds. We’re prefabricating those in our shop into 60-foot lengths, and then we’re shipping them to the site and doing the connecting welds in the field on that bridge.”

Prior to this project, manual GTAW welding had been SCEI’s welding process of choice with other customers. There are drawbacks to the standard approach, and Lincoln Electric helped SCEI improve and innovate their process in order to meet challenging deadlines and remain competitive within the industry.

Re-thinking the status quo

The prior GTAW process worked well in both the fab shop and in the field, says Schenkels, but there were technical challenges and manpower demands that often slowed down

the process. “In the field, you had to keep the wind off the welder,” he says. “You also had to do an argon purge, and you needed skilled welders who understood that purge process.”

Finding those skilled welders was – and continues to be – an ongoing challenge, says Schenkels, who is continually looking for ways to navigate current and future shortages of skilled labor in the welding and fabrication industries.

“Anything we can do to be innovative – any way we can do more with less – is something we would want to explore,” he says. “We don’t want to shoot ourselves in the foot, because we make money by putting people to work. But we also make money by being able to meet a deadline and get a job done. We’re looking for ways to be proactive rather than reactive.”

Part of that proactive approach involves looking beyond standard procedures and thinking outside the box. “It’s easy

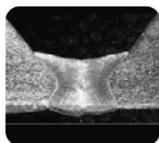
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to say, 'This is the way it's always been done, and this is the personnel we have to do it. We know we can get the job done using TIG and using an old process that may be a little more painful,'" says Schenkels. "But knowing that labor shortages are coming, we chose to really get in front of them and try to avoid them."

The STT solution

SCEI, which has enjoyed a longstanding partnership with Lincoln Electric, met with the welding technology company to explore options to build efficiencies into their existing pipeline manufacturing process and reduce costs. The solution came in the form of STT Field, a newer field welding technology developed by Lincoln Electric. Surface Tension Transfer (STT) comes with several benefits, one being a proven legacy performance for pipe root welding.

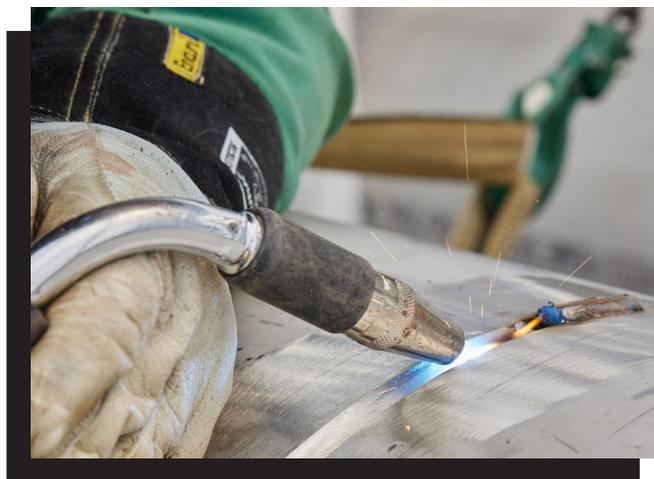
"It was the large quantity of welds that we needed to do at this site that prompted us to say, 'Here's a really good opportunity to have a big impact from a change toward the STT process,'" says Schenkels. "If we were doing one weld here or there, it would really come down to our capacity in the fab shop. But there's more to it than that. There's the welding that gets done on the field side, which is a little different. I think that's what really drove us to look for an alternative approach."



STT FIELD ROOT PASS

- » STT Field mode
- » No backing gas (SS Pipe)
- » No control cable or sense lead

The STT Field solution includes Lincoln Electric's Flextec® 350X Power Connect power source paired with the Activ8X Pipe wire feeder and Lincoln® Red Max® stainless steel wire. In the shop, Lincoln Electric's PipeFab™ system uses the same STT process. This allows the welders an easy transition between shop fabrication and field fabrication of similar pipe joints.



STT field welding

"Sunny Corner was already familiar with the STT process in the shop utilizing the PipeFab shop welding solution," says Wayne Chuko, product manager for Activ8X Pipe at Lincoln Electric. "With the implementation of the portable Activ8X

Pipe/Flextec 350X PowerConnect solution, the same STT process could now be easily applied in the field with minimal equipment, a quick and easy setup and a manageable learning curve."

"We had four positioners set up in the shop – three lengths of pipe laying on rollers and two operators doing the STT process," says Schenkels. "And then we had two other crews capping out with a separate machine. We moved all that work through the shop in a couple months."

By summer of 2023, most of the fabricated material had been moved outside the shop and was shipping to the bridge site. To date, X-rays of weld joints have yielded favorable data and shown welds of consistently high quality.

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Cost reduction, efficiency, mobility

Within months after the STT process was implemented in the field welding portion of the project, the construction and maintenance of the pipeline across the Edmundston-Madawaska Bridge was more streamlined and cost-efficient. The process was field ready, and with the transition to an STT root pass operation, the argon purge in the field was no longer necessary. Root passes passed X-ray inspection with full side wall fusion and a smooth back bead on the inside of the pipe. This not only reduced costs, but saved time by enabling SCEI operators to weld more pipeline joints per day. The ability to do more with fewer workers helps to alleviate the effects of labor shortage.

“Without the need to purge, we’re not lugging gas bottles around every day,” says Schenkels. “As far as our labor force, we have our key welders, and they’re welding twice as fast with this process. This increase in speed, especially on the shop side, makes us more competitive with other pipe fabricators in the region.”



Renaud Jones and Dino Larocque inspecting fit up and preparing pipe for root pass

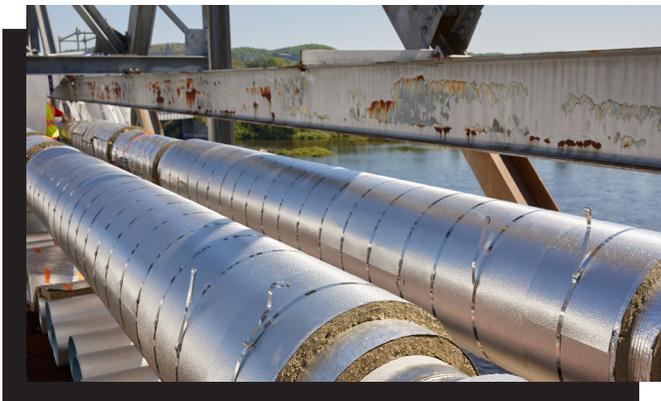
Another primary concern was mobility in the field, says Schenkels. “The shop environment is no problem; you’re bringing the work to the machine,” he says.

“But at the site, you’re bringing the machine to the work. The power source can stay stationary, and the wire feeder can move from one spot to the other.” This is the ideal application for Lincoln Electric’s small and portable Activ8X Pipe wire feeder.



Activ8X Pipe wire feeder on job-site

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Insulated pipelines spanning across the St. John River used to transport paper pulp across the border

The ability to weld more in a single day improves the overall quality of the welds themselves. “If you can get through filler welds and capping in a day, you’re not leaving open roots,” says Schenkels. “You’re not leaving the possibility of cracking. It works better in relation to the shift schedule. You don’t have situations where the operators are saying, ‘It’s late in the day. I shouldn’t start.’ You can gain an extra weld or two in a day’s time that you might not have been able to do otherwise.”

The pipeline construction is a long-term project for SCEI and their pulp mill customer, as the bridge itself is scheduled for a rebuild in 2024. This STT process is an ongoing contractor-customer partnership as much as an immediate solution.

“The customer is putting a lot of trust in us to use the right procedures and take a proactive approach to the job,” says Schenkels. “They’re relying on our expertise to be productive, innovative, efficient, all those things. They aren’t doing this just because they want to do it. They’re doing it because there’s a new highway bridge in the works, and the structure where the pipes run now isn’t going to be there in a year. So in a sense, they were forced into a certain course of action. It’s not a moneymaker for them. It’s a must-do.”

Long-term commitment, long-term success

A truly successful business partnership is one that benefits both sides. With this in mind, Lincoln Electric has some of the most knowledgeable and innovative welding experts in the world who can work with customers to help them develop and implement effective welding solutions. The STT process is just one of those solutions.

“STT was invented by Lincoln Electric engineers, then further developed into an applicable welding solution with assistance from our clients and partners,” says Chuko. “This application with Sunny Corner Enterprises Inc and stainless pipe welding without backing gas really highlights how powerful the partnership can be when both sides fully understand the prevailing challenges and give the proposed solution a chance to succeed.”

For all of SCE’s success with the U.S.-Canada pulp mill pipeline, their implementation of the STT process doesn’t end here. “This isn’t a one-off solution,” says Schenkels. “We’re trying to persuade other customers to accept this procedure, and we’re making good headway on that. Our goal is to use this for all of our stainless pipe welding, hopefully to avoid purging it all.”

He adds: “This particular operation includes a lot of pipe, so there are a lot of welds required on a fairly tight schedule. We knew it would be a job that required a lot of repeatability, so it was an opportunity to try a different approach. If we discovered early on that it wasn’t working, we still had time to correct and go back to the old method. So it was a bit of a leap of faith, but a good place to try out a new process without too much risk and a high potential for gain.”

In the end, there was never a need to course correct or circle back, says Schenkels. The STT welding solution was a leap of faith that paid off for everyone.

SOLUTION COMPONENTS



Activ8X® Pipe™

Compact, portable wire feeder ideal for field welding GMAW applications

Features STT Field and Pulse waveform outputs, as well Crossline® technology for at-the-arc control



Flextec® 350X PowerConnect®

Rugged, multi-process welder: MIG, TIG, Stick, Flux-Cored, and Carbon arc gouging.

PowerConnect® technology allows input power from 200 to 575V, single or three phase, 50 or 60 Hz



Red Max® Austenitic Stainless Steel

Industry-leading MIG consumables with consistent and reliable wire feeding and tight chemistry control. Lot certification for peace of mind in critical applications



PIPEFAB™

The ultimate multi-process welding set-up for Pipe Fabrication, delivering advanced welding performance with next-gen simplicity and control.

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