OPTIMIZATION IN THE PIPELINE

Shawcor Increases Efficiency Through RFID

Value Chain, Tina Claeys, Editor in Chief
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As a global steel pipe coater for the oil and gas sector, Shawcor operates within a very traditional sector. Nevertheless, it is also high time for optimization in the supply chain in this segment. That is why the company, together with system integrator Mieloo & Alexander, examined the possibilities in the field of traceability. The first steps have now been taken within the Pipeline Performance Group division with the help of RFID, among other things. An insightful conversation about this special optimization process with Brent Fisher, Global IT Projects & Solutions manager at Shawcor.

As a Global Energy Services Company, Canada based Shawcor supplies a wide range of products and services. The organization has an annual revenue of around two billion dollars and has about a hundred sites in twenty different countries. More than 6,000 people work for the company. This global positioning enables Shawcor to provide products and services to all major oil and gas companies worldwide.

The Pipeline Performance Group division is one of the most important growth pillars within the organization. The division specializes in coating steel pipes used in oil and gas pipelines. Some of the options are anti-corrosion coatings, thermal coatings or concrete coatings. These activities take place at various Shawcor sites worldwide.

It is important to know that the pipelines are never owned by Shawcor. Brent Fisher: “They belong to an operator. If they want to have pipelines made, various tenders are sent out. To begin with, they will appoint a steel producer to make the pipes. They then send the tubes to us to apply the appropriate coating(s). We therefore work very closely with other parties to get the perfect pipelines to the customer. Since Shawcor’s customers do not always have the space for this, we also store the pipes on our sites until the moment of installation. On the one hand we work for customers on a project basis, on the other hand for distributors who supply their customers with coated pipes.”

Better Traceability within Partnerships

Together with the other links in the chain, Shawcor must be able to deliver a complete record of all logistics movements, steps within the production process and quality inspections that are carried out on each pipe segment. Previously, all registrations on Shawcor sites were done manually, but this has some significant drawbacks. B. Fisher: “Given the size and weight of these types of pipes, this is first and foremost a dangerous job. One tube can easily

hold the weight of an SUV. As we consider safety very important, we encourage operators to stop the movement of the pipe as soon as there is the slightest risk. During their stay on our sites, we move the pipes an average of eight to ten times, so we need to make all those movements as safe as possible. Although that is sometimes unavoidable, we prefer employees not to be too close to the pipes in the area."

In addition, many manual processes are inefficient and prone to errors. "The pipes sometimes arrive with us with old or damaged barcodes or with production numbers that are marked on the inside of the pipe with chalk. It is then up to our employees to identify them on site. It goes without saying that this is an intensive job. Occasionally something is misinterpreted. Things can also be copied incorrectly", says Brent Fisher.

At the same time, customers are increasingly asking Shawcor to help them improve traceability, so that in the event of excessive pipeline wear - or worse - it is possible to locate the source. This way, any other weaknesses can be detected and resolved at an early stage. "Many coaters still work very traditionally. Being one of the first to provide a striking answer to such questions certainly gives us a competitive advantage. Furthermore, our partners in the chain experience the same pressure, so better traceability benefits them as well", it sounds. "By taking the step to digitization, we are thus treating ourselves as well as our partners and customers to a more reliable and safer supply chain. In addition, the centralization of all the data we collect can help us make better decisions in the future."

Support via RFID

In order to be able to make the right choices right away, Shawcor looked for a partner who could provide the necessary ideas and support in the field of traceability. B. Fisher: "We chose system integrator Mieloo & Alexander. That party had already collaborated with Dhatec, a company that we acquired three years ago and that specializes in products that prevent pipes from being damaged in the logistics process. A good example of this are the 'end caps', which we apply to the end of the pipes to keep moisture and dirt out of the pipe."

"We were not only looking for a hardware and software provider, but above all for a party that already had a lot of experience with the implementation of sophisticated identification systems," he continues. "We saw that Mieloo & Alexander has a good feel for various sectors as a major advantage. Ultimately, the basic principles remain the same, only the environment is different. For example, we need industrialized, robust solutions. Mieloo & Alexander turned out to be able to look beyond the walls of the various sectors very well. "

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At Shawcor, the starting point for each project is each pipe's unique ID, length, and heat number, which refers to the origin of the metal. Depending on the further processing, additional characteristics may be added. Although the tubes are made of

metal, UHF RFID turned out to be a suitable means to support traceability within this environment.

Shawcor then worked with Mieloo & Alexander to see how and where RFID could best be done justice. A specific challenge for Shawcor was to find a way to apply the tags in such a way that they survive the harsh environment and handling of the tubes. In addition to the automatic identification of the tubes, Shawcor also wanted to automatically record the locations and movements. For this, the RFID data was linked with GPS coordinates, which are captured when the tube is put away.

First Optimization Steps

Shawcor took the first steps in the world of RFID during a new project in Northern Europe.
B. Fisher: “The customer in question asked us to coat concrete pipes. Since he had also inquired whether we could apply RFID tags to the end caps within that project, we thought this was an excellent opportunity to get started with the technology. ”

After the technological validation, the industrial proof of concept followed. “We then applied RFID tags to the inside of the end caps. In addition, we have equipped the ‘spreader bar’ of our heavy lifting machines with an all-in-one box - with RFID reader, DGPS modem (Differential Global Positioning System) and 4G / wifi, modem - which enables the machine read and trace the tags each time a tube is recorded. We have therefore made the machine a means to closely follow all the movements of the pipes. An important advantage was that during this project we no longer needed operators who had to come close to the pipes to read data.”

Because of the positive results during that test, Shawcor immediately started looking at the other options. For example, the company has now also provided pipes and transport equipment with the necessary equipment in its distributor business to trace movements. B. Fisher: “Together with Mieloo & Alexander, we are now running through all operational scenarios to design the right solution every time. It is quite possible that handheld readers are the most suitable for certain applications, for example to scan stock. RFID portals can also offer perspectives. These are useful, for example, if you have to count serially which pipes leave on a truck for certain customers. This guarantees that only the correct pipelines leave. In this context, it can also be interesting to make automatic ‘snapshot images’ of the shipments, in order to have ‘visual proof of shipment’ as evidence to the customer in addition to the RFID data. In fact, these are all applications that Mieloo & Alexander has already used elsewhere.

Shawcor’s intention is now to set up more and more ‘continuous flow transactions’. “Since we are a very project-based company, we want to integrate the technology into more and more projects. Each project can also bring us new things, ”says Brent Fisher. “For example, we have already learned that we cannot rely on a single RFID tag on a tube. Within our environment you can never guarantee that no tag will be damaged or lost. Luckily our tubes have two end caps, so we can tag both sides. As a backup, we also still have the unique identification of the pipe itself. Creating redundancy is very crucial in our environment.”

RFID Within Partner Network

A major project currently underway at Shawcor

involves a massive Mexican offshore pipeline consisting of as many as 50,000 different pipes. The pipeline in question is being made for TransCanada, a company specializing in energy infrastructure. B. Fisher: “Based on our findings during the first phase, we had an RFID tag designed with a barcode on top, with a view to optimal redundancy. The intention was that those tags would be on the end caps. The key question within this project was when we would attach those tags. If we have to attach the tags when the tube arrives on our site, it will be done in an environment where dust and dirt can affect the quality of the tagging. Moreover, it takes a lot of time for our employees to apply the tags. At that moment we spoke with Dhatec, who supplies our end caps. Together with the producer of the tags, they have ensured that they are already attached to the end cap before they go to the coating sites.

About half of the pipes to be supplied for TransCanada within this project come from Sumitomo, a Japanese steelmaker, and the other half from Tubacero, a Mexican steelmaker. The pipes then go from Sumitomo to two Shawcor coating plants - in Malaysia and Indonesia - where an anti-corrosion coating is applied. The tubes manufactured in Mexico are coated by Tubacero itself. B. Fisher: “In the next phase we started talking with our own factories in Malaysia and Indonesia as well as with Tubacero. We suggested to them to install the end caps right after the anti-corrosion coating so that all those sites - even when not a Shawcor site - have their own efficient tracking system and thus improve the service for the customer. We were pleasantly surprised that Tubacero immediately saw the advantages of this and was willing to jump on the road. After the coating at Tubacero, the tubes now go to our two mobile sites in Mexico, where we receive the tubes and store them until they are ready to install. There the reception of the pipes now takes place by reading the RFID/barcode tags on the pipe. Because those RFID/ barcode tag are huge, the operators don’t have to get very close to read them, which ensures greater safety. Moreover, this way of working appears to be very efficient and ensures error-free reading. ”

Centralization via IoT platform

The ultimate goal is to bring all collected data together on an IoT platform, specifically ViZix from Mojix, which is realized by Mieloo & Alexander. B. Fisher: “This platform allows us to collect information from the various data points, separate from our ERP system. Our ERP does not care about GPS information or ‘time stamps’. For example, we can use the IoT platform to check which movements a tube has undergone on a particular day, at which yard location a particular tube is located, and so on. This platform will also provide our analysts with the necessary data to make certain movements run more efficiently in the future. ViZix also offers the necessary reports and makes it possible to easily visualize certain things. For example, you can download a Google map from your site via the platform to map out certain areas. We are currently working on integrating the project for TransCanada into the platform. Once that’s done, Brent Fisher’s main challenge in recent projects is to find the right identification solution for each specific scenario. “That will always remain a challenge. Therefore, a thorough preliminary investigation for any project is also a must. As mentioned, we also continue to emphasize the importance of redundancy in every project, where identification options must be interchangeable.”

“Furthermore, you have to create a close partnership between your IT people and your operational employees to make such projects succeed. Often there is still a gap between the two, while they have to work together continuously in order to find the perfect total solution, ”he adds. “Last but not least, we have found that a company like ours is better off hiring an external party for such matters. It is absolutely not our ambition to invent hardware ourselves, while system integrators only have to take the necessary solutions off the shelf. The trick is to then combine them in a very targeted manner. In that respect it is a great reassurance for us that we have found a partner in Mieloo & Alexander who can offer us the necessary support for our projects. ”