

# Creating a Culture of Lubrication Excellence and Reliability-Centered Maintenance

An in-depth look at Ingredion Winston-Salem, winner of the 2017 John R. Battle Award

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As the recipient of the International Council for Machinery Lubrication's 2017 John R. Battle Award, Ingredion (Winston-Salem) underwent a complete transformation in its lubricant storage and handling practices, resulting in the company creating a world-class lubrication program. Following is the story of the Winston-Salem facility and its journey to creating a culture of lubrication excellence and reliability-centered maintenance.

## History

Nestled in the hills of North Carolina, the Ingredion facility in Winston-Salem was built

in 1981 and produces starch and syrups from corn. The plant employs approximately 100 full-time Ingredion employees and contractors. A unique feature of the facility is its use of self-directed work groups, which empowers the employees to do what is necessary to make the plant run.

"There's a lot of ownership at this facility and in everything we do," said Jeff Mohn, maintenance manager. "We have contractors with us for 30-plus years, and you don't stay a contractor that long unless you really love where you are and what you are doing. Ingredion is a great place to work."

## The Road to Lubrication Excellence

The Winston-Salem facility's journey began in January 2009 with a lubrication program assessment by Noria. After the findings of the initial assessment, Ingredion learned a great deal about how to make lubrication process improvements.

"I was on the mechanical side and went on the tour with Noria in 2009," said George Warwick, senior maintenance instrument lead. "You're thinking that you're doing it right, but you're not. When Noria gave us their final report, it was like a helping hand reaching out."





Utilizing the Winston-Salem facility's unique usage of self-directed work groups, Warwick, a 28-year veteran of Ingredion and champion of the facility's transformation, decided to lead the charge for change and actively sought out opportunities to help facilitate and improve reliability at the plant. He started attending the Reliable Plant Conference & Exhibition, obtaining information and ideas for implementation at Winston-Salem.

"If I go to a conference or training, I don't look at it as a conference but as an educational experience," Warwick said. "I started going to conferences to get these ideas. You see all

these neat gadgets and realize we have an opportunity to improve. I wanted a lubrication building and was told, 'You have one – kind of.' So, two years ago, I worked with the engineer manager. He asked me if there were any special projects I needed. I made the strategic recommendation for the lubrication building, and it was approved."

The facility took information from the initial assessment and findings and began building and upgrading its lubricants storage room with a bulk filtration system. The plant also bought a thermal camera and ultrasonic grease guns.







“Back in the day, I wanted things lubricated, but it really wasn’t a concern,” Warwick said. “So, time went by, and when the opportunity came for me to be a supervisor, it was time to change.”

Prior to the shift, when there was a problem with a machine, it was relayed over the radios, but the maintenance department was not always the first responders on the scene to investigate the issue.

“The lubricator we had would get there before we did,” Warwick said. “We’d arrive and see it was a bearing failure. We’d break the machine apart and find fresh grease. We were lubricating just to say we were lubricating. We had no defined routes; it was just this guy taught this guy – this is where you walk, this is what you do and that’s how we lived. For me, that created a problem because I didn’t know where he was walking and what he was doing.”

A few years after the facility’s initial assessment, Ingredion had several international plants adopt lubrication best practices with exceptional results. These initial successes, in addition to influence from other Ingredion plants and reliability champions, led to corporate leadership setting a strategy for lubrication and improved asset management at nine North American plants.

“It wasn’t just this plant that made the decision,” Mohn said. “Ingredion made the decision to move this way. Then we started bringing in people to assess what our needs were and help make the lubrication program better. From there, we were able to grow and start making changes in our lubrication program at that time.”

Mohn, who has been with Ingredion for almost two years, believes his arrival at the facility came at the perfect time.

“It couldn’t have been a better time,” he said. “The reality is, when I came in, the company itself had made the decision to focus on reliability-centered maintenance (RCM), and when

you look at the foundations for RCM, one of those foundations is a lubrication program.”

With corporate backing, the Winston-Salem facility had Noria conduct another assessment in 2016. According to Mohn, the plant, including Ingredion employees and contractors, underwent an effort to change the culture through outside training, standardizing processes, knowledge-sharing and hands-on applications to promote reliability excellence.

Working with Noria, the facility implemented a rigorous training program for both employees and contractors, resulting in five certifications in planning and scheduling; two employees becoming certified in vibration and infrared analysis; inception of a Certified Maintenance and Reliability Professional (CMRP) program; the creation of a reliability engineer position; redefining and hiring a new planner/scheduling position; and promoting Matt King, mechanical maintenance lead, into a leadership role to continue driving lubrication excellence.

“My new role is being a guide for the mechanics,” King said. “If they need help or assistance, I help them through that.”

The facility ported the engineering to special software for effective route management and key performance indicator (KPI) tracking. Noria’s engineering also identified machines that needed modification and associated hardware.

When the Winston-Salem facility had a scheduled outage in November 2017, it contracted Noria to send a team to help manage 14 pipefitters for three weeks. Utilizing Noria’s training, the plant trained its team on how to commission the lube room and make machine hardware modifications, which the Winston-Salem crew undertook by outfitting dozens of machines themselves.

“Training has been extremely valuable, as you can’t do the job correctly without the knowledge, and that knowledge inspires good work,” Mohn said. “We know the filtration will pay dividends in extended lubricant and machine life, and we are measuring those impacts. Having an oil analysis program that is configured correctly to make actionable predictive and proactive decisions, coupled with having in-house capabilities to get immediate results, is extremely powerful.”







In regard to training, Warwick completely agrees.

“The training, as far as our group, has had the biggest impact,” he noted. “There were only a few people who really understood lubrication, and the ones who didn’t who actually got the training, they realized what they weren’t seeing. It’s like, I know what you do, but until I actually see what you’re doing, I don’t understand.”

With all of these changes in place, the Winston-Salem facility has begun seeing differences in many aspects of the plant. The facility is now in a transitional phase, moving from reactive to more predictive and planned work.

For Warwick, his daily work life has become more structured.

“It’s what I wanted it to be,” he said. “We had started seeing fewer failures, but now we see the professional side of it. (The lubrication technician) has his cart, he has his lubes, and he’s making his equipment checks – I like it.”

The facility is also starting to see a time savings as well.

“If you have a bad lubrication program, it’s a leading indicator, but if you’re doing OK, it’s a lagging indicator,” Warwick said. “It’s hard to justify. It’s hard to measure something so important that people take for granted. There’s still some fine-tuning, as we’re not quite there yet.”

In addition to focusing on lubrication excellence, a bonus of the journey has been the awareness sparked in the facility.

“In the beginning, when the lube building was going up, everyone was curious,” Warwick said. “People would ask, ‘What are you doing?’ We’d say, ‘Building a lubrication building.’ ‘Well, what do you need that for?’ ‘Because we’ve got a goal to achieve.’”

A 24-hour surveillance system was installed in the lube room due to its contents. Surveillance footage showed that a lot of people were going into the lube room just to see it. From that point, the curiosity grew into more awareness of the lubrication program and its importance for the facility. In fact, the team has noticed an increase in the work orders stemming from

operator awareness.

“Awareness has been the biggest improvement,” King said. “Everyone can see what the oil levels are. Everyone who has their hands in maintenance sees the benefit of it. Operations is coming around. I know they’re noticing because we get work orders.”

The machine modifications have also led to increased awareness from operators.

“With the visible sight glasses, we’ve gotten a ton of feedback when it’s low,” Warwick said. “I’d like to get to the point where the operator could come and top it off.”

Mohn believes one of the main factors in the increased awareness was the company-wide communication during the lubrication program’s transformation and Noria’s involvement, particularly onsite. In addition to using a town-hall format as a way to communicate the objectives to accomplish, Mohn also went to individual shifts and began talking to people on that level.

“We communicated why we were doing it and the impact,” Mohn said. “We also talked about it from a corporate standpoint. We are working with Noria to develop an operator communications/training program so we can help our workforce better understand why we are doing what we’re doing, and what our expectations are as well.”

Next year the facility will be moving to more of a lean mentality, which should couple well with what is being required of operators in terms of reliability.

“Operator care marries up with what my tasks are from a lubrication standpoint,” Mohn said. “You can look at a breather, sight glasses and all those things. As a company, we are working toward that. As a smaller facility, we have an advantage because things are communicated organically. We still have a lot of training to do, and that’s where we are heading.”

## Winning the Battle Award

While the day-to-day changes at the plant became visible to everyone at the facility, the importance – and excitement – behind the transformation became more palpable after receiving notification that Ingrederion Winston-Salem had won the 2017 John R. Battle Award for excellence in the application of machinery lubrication.

“That trophy changed things almost immediately, adding validity to and recognizing the changes we implemented,” Mohn said. “I’m really glad we went after that award. It really made a difference.”

## The Noria Difference

The Winston-Salem facility’s relationship with Noria has evolved since 2009, and the team realizes that a vital key to the plant’s success stems from working with Noria.

“Without Noria, to get where we are now, it would take us years,” King said. “We implemented so much so fast, and





the continued support has helped us stay on track. We've really been moving forward, and everyone from Noria has been a really big support. It wouldn't have been possible for us to get through it as quickly or as efficiently without Noria. We just didn't have the bandwidth. Even if you went to the class and tried to apply all of that, you're going to miss parts. That's why you need the support from someone outside who deals with that every day."

Warwick, who has the longest relationship with Noria, echoes King's sentiments.

"With our work environment, if we stopped all our work, it would probably take us a year to modify all the machines, but that means we wouldn't get anything else done," Warwick said. "With Noria's help, we made some modifications online before shutdown, and then during shutdown, we made the rest of them in only one week."

Mohn agrees that working with Noria made a significant difference, particularly when it comes to relationship-building.

"It's the personal relationships that have been developed from a support standpoint," he said. "I know I can call up any of the guys who've been here and say, 'I have this problem, I have this need, what do I do?' and I know that I will get that support. That's probably the biggest thing for me, knowing I can do that. I know I can call up Noria to help me and support me in that decision."

Mohn also cites the level of customer service he has received from Noria as a benefit to creating that lasting relationship.

"I would highly recommend Noria," he said. "If I have a problem or if I have a need, the customer service has been incredible. We talk about the customer experience here all the time and developing those relationships that keep customers coming back over and over again. I don't have anyone else I deal with that has embodied that concept as much as Noria. It's that personal relationship and commitment. I feel like they are invested in my success, and I need that."

## On the Horizon

As the Winston-Salem facility continues its pursuit of lubrication excellence and reliability-centered maintenance, the team is focused on what the future holds. For King, his goals include additional training and sampling.

"We still have critical pieces of equipment that need to be sampled that we're not sampling," he said. "We've got 50 samples we're sending out quarterly, but there's always opportunity for more. As we get more efficient, we can do more. For my department, we need more training as far as getting people certified in vibration. I've been around lubrication as long as I remember, and there's so much I know now that I didn't know before."

For Mohn, all of the current changes will lead to the Winston-Salem facility having a more self-sustaining existence.

"In two years from now, the goal is to have self-sustaining sections within the organization," he said. "The infrastructure is designed to – at some point – operate on its own. That would mean we need to be great – not good, but great – at root cause analysis, because that will take what we find in our inspections, failures, etc., and put that all together and generate the right type of standard of work, right type of procedures and right type of bill of materials so we have what we need when we need it."

Mohn also would like to take the successful elements from the lube room and move them into the plant's maintenance infrastructure.

"It's really good linkage to how it's all supposed to work with the right things in the right place, and moving that deeper into the maintenance organization," he added. **ML**

