THE CHALLENGE

For a manufacturer of drywall finishing products, using obsolete PLC-5 controllers on their production lines was becoming a bigger risk as aging components began to fail more frequently, and spare part availability dwindled.

The Solution

Polytron implemented a multisite obsolescence management program to upgrade the obsolete PLC-5 controllers to new ControlLogix systems. During these upgrades, we also took the opportunity to improve the outdated HMI and network infrastructure that led to enhanced performance across the operation.

Future-Proofing Production Through Obsolescence Management

The Result

As the obsolescence management program is rolled out to more facilities, we are greatly increasing production reliability as we eliminate the risk of unplanned downtime associated with their aging equipment while also lowering their maintenance, repair, and operations (MRO) inventory and costs.

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EXECUTIVE SUMMARY

Future-Proofing Production Through Obsolescence Management

Client: Manufacturer of Drywall Finishing Products

Challenge:
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Solution:
Polytron implemented a multisite obsolescence management program to upgrade the obsolete PLC-5 controllers to new ControlLogix systems. During these upgrades, we also took the opportunity to make improvements to the outdated HMI and network infrastructure that led to enhanced performance across their entire operation.

Results:
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The Project
In 2020 and 2021, the COVID-19 pandemic caused many people to spend significantly more time at home. As a result, demand for home building materials skyrocketed as individuals sought to enhance their living spaces and new home starts rapidly increased. For one manufacturer of drywall finishing products, this surge in demand was a dream come true, except for the fact that increasing production quickly magnified obsolescence issues with their production lines. As their spare part stockpiles dwindled, and it became increasingly difficult to track down parts through third-party suppliers or sites such as eBay, the risks of not upgrading their obsolete hardware intensified.

With multiple manufacturing facilities requiring different levels of modernization, the company's leadership set out to find an experienced integration partner to implement an obsolescence management program. Since our team had maintained a relationship with key contacts after installing and supporting a few new lines at their facilities more than a decade ago, they were very interested in having us provide a proposal for performing these upgrades. We were eventually awarded the project and started this engagement by meeting with key stakeholders at the manufacturer's facility in the metro Atlanta area to understand their main concerns.

Capitalizing on a Controller Upgrade
Although this project was initiated by component obsolescence, with the main goal being to replace the PLC-5 controllers with new ControlLogix systems, it also served as a catalyst for stakeholders at each facility to identifying opportunities for process improvements. Additional upgrades identified included the following:

- Revamping decades-old HMIs to incorporate a cleaner, more modern look and feel for operations
- Adding new drives and upgrading some communications to Ethernet for better control and accessibility during the batching process
- Putting in a new sink pump that enabled plant personnel to verify each batch for consistency and texture before diverting to packaging
- Automating recipe management to improve quality and minimize waste
- Resolving an existing bug at the Atlanta facility that caused the operators to have to work around a batching sequence that would consistently get stuck.

Upfront Planning Minimizes Implementation Downtime

As we started work at the first facility, we realized there were a lot of changes made to the control system over the years, leading to a piecemealed system with many undocumented components. We also had to decipher a lot of old code so we could successfully convert it for the new ControlLogix system. Since our downtime window for making all the necessary upgrades was limited to one weekend, we had to invest a lot of time upfront into understanding the existing system and its performance.

To ensure a smooth process for the HMI upgrades, we hosted multiple workshops at our office where we first white-boarded their engineer's ideas. Our team then developed the new HMI and hosted their operators onsite for a working session where we used the new screens and listened to their feedback. After multiple iterations of this process, we knew everyone was comfortable with the new HMI and we were confident it would meet the needs of all stakeholders and be easy for operators to adopt.

We also had to carefully plan our selected downtime window for a couple of reasons. First, the customer needed to build up a product stockpile to keep up with demand. Second, we ran into some COVID-related supply chain issues with obtaining hardware and needed to be sure all components were in hand and verified before installation.

Leveraging Efficiency Gains in Facility Number Two

Once we completed work at the first facility, our team began applying the lessons learned to the next facility in Indiana. While this facility had three lines instead of one, the scope of work for each line was very similar to the work done at the first facility. As a result, we gained efficiency on this project by keeping the same project team together and leveraging our learnings from the first facility.

For example, flowmeters are used to track the amount of each ingredient going into a batch and a high-speed counter card totalizes ingredient flow. When we upgraded the high-speed counter cards at the first site, we found their flowmeters didn't work with the new high-speed counter cards selected. After troubleshooting, we replaced the high-speed counter cards and adjusted the programming, which resolved the issue and saved us time and money at the second site. Similarly, we worked with the client to adjust the install schedule of each site to allow us to use the same installation contractor, leveraging learnings from the first installation to prevent construction delays and change orders on the second installation.

Performing Comprehensive Operator Training and Knowledge Transfer

To avoid post-implementation issues and increase ownership of the new system, we facilitated sessions for the operators to see and interact with the updated HMI prior to start-up. Through these sessions, we provided visibility into the system changes upfront via hands-on training sessions held in our office for both operators and engineers.

Further, for the Indiana facility, we first hosted a Microsoft Teams training session for the operators and engineers wherein our team reviewed the new screens and recipes and discussed how the updated HMI interacts with the PLC program. All of this was completed prior to going onsite for start-up. This advanced knowledge transfer facilitated a near vertical startup, minimizing unplanned downtime and production loss.

ENSURING A SMOOTH START-UP

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Turning a Project into a Program

After working on these first two sites, our team developed an excellent understanding of the customer's system architecture, and the hardware/technology required to support their production lines. We also built a great relationship with the customer and developed a streamlined methodology for bringing this obsolescence management program to their other facilities.

Thanks to our programmatic approach and focus on leveraging lessons learned, we completed the bulk of the design, drawings, bill of materials, and programming for the third facility in just two weeks. This method of addressing automation obsolescence assists our clients in better managing risk, increasing uptime and efficiency, and saving time and money across the lifecycle of the program.

About Polytron

Polytron partners with manufacturers to address complex business challenges. We first develop a thorough understanding of opportunities and then leverage our expertise and industry best practices to develop and implement a strategy that delivers results.

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