Kimberly-Clark nonwovens facility takes Plant of the Month honors

Plant of the Month: Kimberly-Clark's nonwovens plant in LaGrange, Georgia, weaves predictive maintenance into its very fabric.

Kimberly-Clark's nonwovens plant in LaGrange, Georgia, went into operation in January 1985. The plant manufactures fabrics and synthetic fibers that are the cornerstone in the development of many of Kimberly-Clark's premier personal care and health care products, including diapers, training and youth pants, incontinence products, and feminine pads and wipes, as well as protective apparel, surgical drapes, gowns and face masks. "The materials are produced in rolls and sent to other Kimberly-Clark locations for converting into finish products," explains David Walls, maintenance technician. "Our materials support our health care, North Atlantic consumer products and Kimberly-Clark professional businesses."

Four base machines produce nonwovens and elastomeric material, and each line has an assortment of extruders, mass air flow, a conveying system, calendaring system and a winding system.

The 616,500-sq ft plant, the Plant Services Plant of the Month, needs 230 employees to operate 24 hours/day, 365 days/year. "There are 35 people under the maintenance umbrella," says Walls. "Of these, 12 cover the 24-hour operation, 17 provide improvement on the assets and six provide planning and scheduling support."

In recent years, the plant's general population is using more of the predictive techniques on a daily basis. They're returning to area responsibilities. Predictive maintenance equipment has been upgraded lately, and some new equipment has been added. Lean manufacturing principles were implemented in 2010, as well.

"We've always had a proactive maintenance program in place," explains Walls, "but we started a dedicated predictive program in 1996. Before that, it was a when-we-have-time situation. The reasons behind a dedicated program were to improve equipment reliability and identify the recurring problem machines. This also improved the maintenance efficiency."

The plant's predictive maintenance (PdM) program is responsible for managing more than 200 pieces of equipment across four lines including fans, compressors, pumps, gear boxes, extruders and ac/dc motors — variable speed and constant speed.

"By combining the predictive and preventive programs, we're able to schedule the equipment that needs to be worked on during a scheduled down," explains Walls. "Along with scheduled outages when all the equipment is down, we're able to perform needed maintenance. We also bring in vendor reps to assist on critical equipment. And operations has an understanding that the equipment has to be maintained so they can produce a product on their time frame."

The predictive maintenance program features infrared thermography, high-speed photography and ultrasound. Kimberly Clark also relies on Azima DLI's portable vibration data collectors, online systems, and software for machine condition assessment and vibration analysis.

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"Vibration analysis is used for bearings, alignment, imbalance and the general health of the equipment," says Walls. "Infrared is used to determine electrical faults, bearings, process conditions and again the general health of the equipment. We also use high-speed photography to slow the equipment down to be able to see the process and the condition of the belts and gears." Sound equipment and strobe lights are used in conjunction with the vibration program. Ultrasound's primarily applications are on steam traps, gear boxes, bearings and valves. "If you can hear it, you have found it," quips Walls. "Strobe lights are used for the general movement of the equipment and the speed of the equipment."

The plant has three automated SpriteMax online monitoring systems and is in the process of setting up a fourth and last one now, in addition to the utilities equipment. "We will still use the manual system on the redundant equipment until those are set with an automated system," explains Walls.

As part of the manufacturing process that requires managing massive air flow, the plant might have as many as nine pumps that it's monitoring, but not all of them run all the time, so the criticality ranking is lower. On the other hand, a large compressor without redundancy takes priority.

"Several things go into how critical a piece of equipment is — cost of replacement, time to replace, can we rent a replacement and can we run for a short time without it?" explains Walls. "We also use the manufacturers' recommendations."

Maintenance and replacement schedules are based on readings and the weight of specific equipment's criticality. "We have scheduled maintenance items on all of the equipment in addition to the predictive program," says Walls. "If something is found, time will be scheduled to correct or troubleshoot that problem."

Equipment readings are taken on a cycle of scheduled maintenance, versus a formal, documented criticality ranking. Nearly all equipment in the plant is considered critical. However, some pieces of equipment are read more frequently based on size, cost of the equipment and redundancy. For example, higher-cost equipment without redundancy is read more frequently than other equipment, and often between cycles.

"We have always had a CMMS system," says Walls. "Currently, we're using SAP. We established manual vibration and IR routes early and refined them over time. We're now rolling over to automated online vibration data collection systems. We had vibration and IR from the beginning. But starting in 1996, the information gave us a different picture.

This allowed us to work on the problems and become more efficient within the maintenance group."

Daily/weekly consumables and long lead items are kept in spare parts inventory. "We have a computerized system that keeps up with the items we keep on hand and reorders on an as-needed basis," explains Walls. "All of this is reviewed and updated as needed."

The plant also has an energy monitoring program in place to help track that cost. "It lets us know if there has been a change up or down," explains Walls. The mill manager ultimately is responsible for energy costs. "He, in turn, has someone on the staff looking at what the cost is and whether we can affect it," he says. The maintenance organization's role in maintaining energy efficiency involves keeping the equipment in the best shape possible.

Within the first year-and-a-half of using a formal PdM program, the plant calculated savings of approximately $1.5 million in actual cost avoidance. "These were calculated from a time avoidance evaluation," explains Walls. "It was calculated from a best-case scenario. In other words, all the parts were on hand, all the right people were on hand, the job went perfectly, the machine was already down, the lowest possible machine costs were used, and, last but not least, the machine came back up on the first try with the lowest possible waste."

These are real numbers if you identify the items that would have caused a delay, if they were run to failure, explains Walls. "We threw out any item that was questioned or disagreed with," he says. "We quit recording this number because it became so large that no one believed it. After that, we began to report uptime from a maintenance perspective. Now it's looked at from how many failures we've had in the past month, six months and year. We're fortunate in that management and operations support and believe in what we are doing."