

General Mills Quits Throwing Energy Down the Drain

By Paul Studebaker, Editor in Chief, SustainablePlant.com

By industry standards, the maintenance team at General Mills' refrigerated and frozen dough facility in Murfreesboro, Tenn., was doing pretty well at keeping up with monitoring steam traps. They didn't always get to their preventive maintenance rounds in a timely fashion, but they'd still eventually identify failures and were replacing about 20% of their traps every year.

They were also throwing \$44,000 worth of energy literally down the condensate drain. That turns out to be more than enough to justify a project to install Emerson 708 wireless acoustic monitors on the facility's 93 steam traps.

"In a healthy plant, 20% of the steam traps are probably failed or not working properly," said Richard Luneack, project coordinator for the Fluor team embedded at the plant, during his Thursday morning presentation, "Steam Trap Monitoring." When traps leak or fail open, raw steam floods into the condensate return lines, wasting energy and raising back pressure on other traps. On an open condensate system, you may see steam pouring out of the roof vent.

When a trap fails closed, the system it controls can flood, compromising the efficiency of heat exchangers that drive production, inducing water hammer and even leading to mechanical failure. Luneack said, "If you're standing around there when that happens, you can get burned."

Steam traps are conventionally monitored by inspection using a combination of instrumentation, such as thermal imaging, temperature probes and ultrasound detection. "It takes about two hours per trap to do it properly," said Luneack's co-presenter, John Hillencamp, senior sales engineer, Emerson Process Management.

Luneack made a simple cost analysis based only on energy savings and easily justified the steam trap monitoring system. The team started with a pilot of nine sensors, which are simply band-clamped to the steam pipes, preferably about six inches upstream of the trap. The initial system transmits over distances of up to about 400 feet and penetrates concrete block and tip-up walls, pre-stressed concrete floors and even the insulated steel walls around some of the hot equipment.

The transmitters measure sound intensity to detect leaking traps and temperature to detect traps that have failed closed. Trap status is displayed on a preconfigured dashboard as OK (green), leaking (red) or failed closed (blue). "With the software, you have to do a little set-up," Luneack said. "For the first nine traps, it took about five minutes."

On start-up, the system won approval from the maintenance technicians when a bucket trap they'd suspected of leaking was immediately flagged red. Based on the pilot's success, Luneack put 84 more Model 708s on order. After that, Luneack plans to analyze the steam traps in the adjacent Yoplait plant and to look at monitoring relief valves. "We also have a large ammonia refrigeration system," he says. "We want to know right away if that relief valve opens."



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