



Minncor - MCF Faribault



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Organization Background

The Minnesota Department of Corrections (DOC) created Minncor Industries (Minncor) in 1994 to unify facility programs across all DOC locations into one business that could be less reliant on government funding. The DOC also created Minncor to provide incarcerated people job skill training, meaningful employment, and opportunities to practice proper work habits. They currently offer laundry services for 27 accounts, which range from other DOC facilities to veterans homes and schools. The facility can process 3.5 million pounds of laundry yearly.

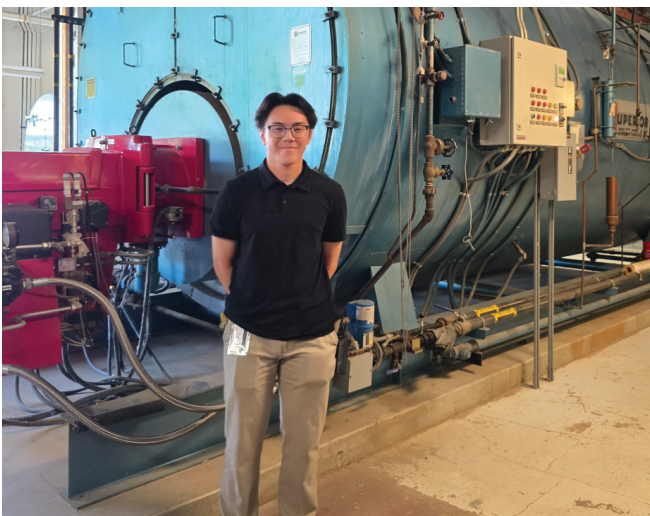


"This summer I had an amazing opportunity to work with Minncor Industries through MnTAP. I employed my skills for sustainability work and optimizing resource usage in an industrial laundry facility, and I learned about steam systems. I will be forever grateful for my summer experience and want to thank MnTAP and DOC staff for a wonderful internship!" ~ RB

Project Background

This project focused on the steam condensate recovery system and laundry equipment. The laundry facility's steam condensate system is venting approximately 3.7 million pounds of low-pressure steam to the atmosphere, which can be recaptured as a source of water and heat. In addition, the facility is interested in upgrading the laundry equipment to increase processing time and efficiency.

The DOC and Minncor are seeking to reduce resource usage and waste by 10% and increase laundry processing by 10%.



SOLUTIONS

Replace Broken Heat Exchanger

Reintroducing a low-pressure, steam-to-water heat exchanger will reduce low-pressure steam venting. The recaptured heat can then preheat water for the facility's water heater while the collected condensate can be reheated to steam. Excessive pressurization of water tubes has caused the facility's old heat exchanger to fail. To recapture low-pressure steam, Minncor should replace the heat exchanger, add more safety valves, and update the controls for steam demand. Implementing these steps will save 444,000 gallons of water, 32,700 therms of natural gas, 1,100 kilowatt-hours (kWh), 7,000 pounds of chemicals, 4,700 pounds of softening salt, and \$32,000 per year.

Replace Two-Stage Press with One-Stage Press

The facility processes 43,399 loads per year. The current two-stage extraction press' maximum load weight limit is 90 pounds, while the weight limit of the batch washing line is 110 pounds. Minncor will switch to a new press in Fiscal Year 2026. The recommended one-stage press will still have a maximum weight limit of 110 pounds. Matching the batch wash weight with the press weight will allow a 22% increase in weight per load with potential to decrease yearly loads to 33,874. This will save the facility 322,000 gallons of water,

Solutions

12,000 therms of natural gas, 8,400 pounds of laundry chemicals, 6,500 pounds of softening salt, and \$11,800 per year.

Install Two Smaller Washers to Replace Broken Washer

Commercial washers are being underfilled at an average fill ratio of 58% of the rated capacity for all washers and 49% for the 275-pound washer-extractor. Washers are set at the highest water and chemical settings for ease of use and to minimize rewashing, but this leads to overuse of resources per wash. Since Minncor is planning to upgrade washers in Fiscal Year 2026, it is recommended to replace the 275-pound washer with two 130-pound washers to increase loading efficiency to 73%. This will save 540,000 gallons of water, 2,200 therms of natural gas, 30,000 kWh, 3,500 pounds of laundry chemicals, 11,000 pounds of softening salt, and \$11,900 per year.

Program and Run Automatic Drying Settings

All 120-pound commercial dryers dry at fixed times based on garment type. Since loads are usually underfilled, drying times are taking longer than needed. Commercial dryers' automatic settings use moisture sensors to detect when clothes are dry. After testing automatic dryer settings, the underweighted drying times are now proportional to the weight of each load, and thus, take less time to dry. If fully

implemented, this will save 8,500 therms of natural gas, 5,200 kWh, and \$4,500 per year.

Install Exhaust Sensors and Software for Automatic Drying

The 240-pound, batch washing line's natural gas dryers dry at fixed times based on garment type. Exhaust sensors, which measure the outgoing temperature of the exhaust to determine when loads are fully dry, are installed in dryers. Since the facility has not finished setting up all exhaust sensors, processing times are taking longer due to loads being overdried or still wet. With the new press raising the weight load from 180 to 220 pounds, installing exhaust sensors will facilitate reprogramming of drying times. This will save 3,400 therms of natural gas, 6,000 kWh, and \$2,900 per year.

"Our MnTAP intern did a fantastic job, giving us some great cost-saving insight."

*~ Scott Ewest, Power Plant Chief Engineer,
MCF - Faribault*

This table shows only the largest annual reduction per recommendation. For all annual reductions, refer to the text.

Recommendation	Annual Reduction	Annual Savings	Status
Replace broken heat exchanger	444,000 gal water	\$32,000	Recommended
Replace two-stage press with one-stage press	322,000 gal water	\$11,800	Recommended
Install two smaller washers to replace broken washers	540,000 gal water	\$11,900	Recommended
Program and run automatic drying settings	8,500 therms	\$4,500	Implemented
Install exhaust sensors and software for automatic drying	6,000 kWh	\$2,900	Recommended

MnTAP Advisor: Jon Vanyo, Senior Engineer