

CASE STUDY

# First Large-Scale RICE Project in Wisconsin Provides On-Demand Energy

Following the successful execution of the A.J. Mihm and F.D. Kuester Generating Stations, Burns & McDonnell was hired by Wisconsin Public Service to provide engineer-procure-construct (EPC) services for a new brownfield reciprocating engine generation facility. The new plant is located at the existing coal-fired Weston Generating Station and utilizes seven Wärtsilä W18V50SG engines combining for a net output of 128 megawatts.



Achieving speed to market and maintaining safety and quality of the new facility were important every step of the way for this project. Wisconsin Public Service needed to get this generation asset online quickly to meet peak summer energy demand. Each day past the target in-service date for the plant could have resulted in lost revenue and potential compromised reliability for the grid in Wisconsin. The Weston Reciprocating Internal Combustion Engine (RICE) Generating Station was required in order to retire aging coal and gas generating units and replace the units with the more efficient, reliable Wärtsilä engines. The integrated EPC project team, along with the firm's metal fabrication shop, AZCO, was vital to the success of this project.

## Project Stats

### Client

Wisconsin Public Service

### Location

Wausau, Wisconsin

# 128-MW

RICE POWER GENERATION STATION

# \$175M

TOTAL INSTALLED COST

## Challenge

With the global supply chain facing unprecedented instability in 2021 and 2022, the project team faced significant challenges in equipment delivery delays throughout the project's duration. Most notably, the medium-voltage switchgear for the project arrived on-site nearly six months late. During this delay, Burns & McDonnell conducted thorough and persistent vendor surveillance consisting of daily meetings and weekly visits to factories in order to provide Wisconsin Public Service with clear and accurate information about the status of the equipment fabrication, forecasted delivery and the delay impacts to the project.

A detailed work plan was pulled together on-site to see that the switchgear was set and built out, and cables pulled and termed, as safely and quickly as possible. The work was planned for two months and was completed in one due to the efficiencies identified in planning and added night shift work.

Additionally, the project team had to react quickly during commissioning when it was discovered that cooling piping for the project was routed incorrectly. Similar to a car engine, a RICE unit has cooling water piping routed to radiators: Water from the engines comes in, is cooled and goes back out to the engine. But in this case, what the original equipment manufacturer provided was flipped: The supply was routed to the return and the return was routed to the supply.

## Solution

Burns & McDonnell reimagined the startup and commissioning process to continue making progress through these unexpected schedule and equipment challenges. The team safely managed the execution of this revised process to achieve commercial operation of the plant on schedule.

The project team was especially innovative in solving the RICE unit piping challenge. Within the unit, the cooling water piping leaves each engine, goes underground, then back above ground to radiators. The supply and return cooling piping typically connects to the radiator at different elevations, side by side. The project team's solution was to reroute and swap the piping at the radiators to reverse the flow direction, which meant significant pipe redesign, remanufacturing and reinstallation.

The project team developed a solution and sent a request to Burns & McDonnell India the same day the cooling water piping challenge was discovered. The team, based out of Mumbai, had the solution modeled and designed overnight and sent back before the on-site project team arrived the next morning. Drawings were then sent to AZCO, the firm's full-service industrial constructor and fabricator, for fabrication to begin.

AZCO quickly got to work, leveraging its local resources and facilities in Appleton, Wisconsin, to further expedite delivery of the piping solution. Aware that designs for each of the 35 radiators were identical on paper, the pipe shop's foreman drove 90 miles to the site to measure each specific piping location. His field measurements revealed slight variations that would give his fabricators the precise information necessary to craft 70 custom pipes in all. Each would be delivered to the site within a week, keeping the overall project on schedule by preventing what could have been four to six weeks of delays.

## Results

Throughout the project, cross-collaboration across the many divisions in Burns & McDonnell was crucial to keeping the project on schedule and within the predetermined budget. The success of this project only further bolstered the strong established relationship built by Wisconsin Public Service, Burns & McDonnell and AZCO. The speed with which the project team delivered the solution, despite numerous setbacks outside of the team's control, helped the firm to live up to its reputation of delivering timely and quality solutions.

The addition of the new RICE units offer a more sustainable and reliable means for WEC Energy Group to continue to meet rising energy demand with reliable power to balance intermittent renewable energy sources. The EPC project team, working with AZCO, provided success for the project to be completed on schedule and on budget.

## About Burns & McDonnell



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