Cleaner Energy in Wyoming

Emissions of nitrous oxides — commonly known as smog — are down 20 percent to 30 percent at one of the nation’s largest coal-based power stations. By the end of 2011, they will be down even more, thanks to an environmental control system designed and supplied by Burns & McDonnell. The 1,710-megawatt Laramie River Station produces enough electricity to power about 1.4 million homes. The station is an integral part of a generating family that produces electricity for rural electric customers in nine states across two electrical grids. The station’s operator, Basin Electric Power Cooperative, is two-thirds of the way through a three-year, $20 million program to improve the efficiency and reduce emissions from its three massive boilers. “By making modifications to the furnace, we were able to modify the combustion process to elongate the fireball in the boiler and lower its flame temperature,” explains Jeff DeWitt, Burns & McDonnell project manager. “These changes help inhibit nitrous oxides from forming in the first place.” This overfire air system has been installed on two of the plant’s three boiler units. Design for the third is complete, with construction set for spring 2011.

For more information, contact Jeff DeWitt, 303-474-2256.

Reaping the Rewards of Design-Build

Design-build delivered the solution for the city of Riverton, Wyo. The Public Works Department knew it needed changes in its preliminary treatment system — or headworks — and biosolids handling. It also knew construction bids would be limited under design-bid-build by competition from the natural resources development industry. Burns & McDonnell, teamed with general contractor Garney Wyoming, completed a solids dewatering facility and comprehensive headworks improvements under the first municipal wastewater design-build contract in the state. “The design-build team took the uncertainty out of the project, using available local labor in combination with regional sources,” says Bill Urbigkit, public works director. A high-solids centrifuge replaced the sludge drying beds, and headworks upgrades included replacing the bar screen and grit classifier and adding a screenings washer/compactor and grit conveyance system. “The project became operational two months early and 10 percent below budget,” says Darin Brickman, Burns & McDonnell project manager. “The team produced a facility that shows the advantages of alternate project delivery.”

For more information, contact Darin Brickman, 303-474-2244.
Expanded Capacity, Regulatory Compliance

Integrating new systems in an operating refinery requires detail, finesse and creativity. Murphy Oil needed to ensure compliance with U.S. Environmental Protection Agency rules on sulfur and benzene in fuels. Under an engineer-procure-construct contract, Burns & McDonnell converted an existing hydrotreater to produce ultra-low sulfur diesel, revamped a kerosene hydrotreater to produce ultra-low sulfur kerosene, and installed a new naphtha splitter. To optimize space and reduce turnaround time, the pipe rack was installed above the existing hydrotreater. "To support construction through winter, the work area was enclosed with a temporary, heated shelter, shielding workers from below-zero temperatures, biting winds, snow and ice," says Gerald Potter, Burns & McDonnell project manager. "This was a key element enabling project completion ahead of schedule." Future operational flexibility was built into systems, and the refinery can now process light cycle oil on site, creating new revenue streams. The project met all regulatory requirements and increased capacity. "The team used creative and innovative thinking to turn over a successfully operating system under budget," Potter says.

For more information, contact Warren Kennedy, 816-822-3384.

Construction Challenges
Go Underground

The Red Line subway station at Grand and State streets in Chicago continues to operate while the station undergoes a complete renovation. Updates to the 1940s station will accommodate increased capacity and meet Americans with Disabilities Act standards. Maintaining street and station access throughout the project is difficult, but working around the 100-year-old Rock Bottom Brewery building presented the biggest challenge. "To accommodate additional capacity, expansion was required under the building's foundation," says project manager Tom McCay. "The entire east foundation was supported independently above the station's expansion area." An intricate earth retention system maintained 40 feet of earth below the roadway and supported the popular restaurant. Micropiles in the basement were supported by bedrock and tied into the retention system with lateral needle beams for temporary support. Major utilities were moved before construction, and others required protection and support. Improvements will modernize the facility and increase convenience and safety. The third and final phase of the $67 million renovation is on track to be completed in fall 2011.

For more information, contact Tom McCay, 630-514-5603.