Take a tour of Dry Fork Station … with **Joel Dingman**

By Tracie Bettenhausen

When you tour a coal-based power plant, what are your expectations?

Joel Dingman, operations superintendent at the Dry Fork Station, says people are thrown off right away at the front door. "Visitors expect someone to greet them in coveralls, and head-to-toe in coal dust. They often say, 'Are you sure you burn coal here?' They're amazed at how professional and clean everything looks," Dingman says.

Let's follow Mr. Dingman as he takes us on a tour of Basin Electric's newest plant.

The turbine deck houses the equipment that ultimately generates electricity and sends it out of the building to power lines. Since the turbine/generator sits on a suspension system, visitors can feel the difference if they stand on the turbine pedestal, and then step to the side. The pedestal is isolated from the rest of the plant by an engineered gap in the floor, protecting vital equipment from vibration. The turbine (toward back of photo) has three sections: high, intermediate and low pressure. It spins at a constant 3,600 revolutions per minute and creates 563,220 horsepower. The high-pressure/intermediate-pressure rotor is 25 feet long and weighs 22 tons. The low-pressure rotor is 27 feet long and weighs 52 tons. Coal heats up water in the boiler, creating steam. The steam travels to the turbine, and spins it. The generator (foreground) rotor is attached to the turbine and charged with direct current to create an electromagnet. As it spins inside the stator at a constant 3,600 rpm, electrical current is created in the stationary windings.

Operators monitor all power plant systems from the control room. The control system uses a relatively new technology called Foundation Fieldbus. It reduces the wiring required for installation and allows "smart" field instruments to self-diagnose and report problems to the control room. "Visitors are often amazed that just one operator can control the power plant from this room," Dingman says. In this photo, Plant Manager Tom Stalcup (left) explains to U.S. Sen. John Barrasso how the station operators monitor plant operations.

The air-cooled condenser covers 2.14 acres and is 114 feet tall. Forty-five fans cool steam to water without losing volumes to evaporation. Tube bundles sit on top of each fan in a triangular shape. There are more than 14,000 tubes. Each fan is 36 feet in diameter and is driven by a 250-horsepower motor to a speed of 100 rpm. Beneath the fans, the steel structure is open to allow air through. When air exits through the top of the fans, it is about 30 to 50 degrees warmer than when it entered.

To schedule an on-site tour of the Dry Fork Station, contact Joel Dingman (jdingman@bepc.com); Curt Pearson (cpearson@bepc.com); Daryl Hill (dhill@bepc.com).