

**For American Electric Power, accurate mercury emissions monitoring is key to meeting regulatory demands, reducing costs.**

American Electric Power (AEP) may not be one of the most familiar corporate names to the public, but AEP's millions of customers throughout the country would have a hard time naming another company that has such a profound minute-by-minute effect on their lives. Columbus-based AEP, which celebrated its 100<sup>th</sup> anniversary in 2006, owns seven electric power public utilities that are household names in Arkansas, Indiana, Kentucky, Louisiana, Michigan, Ohio, Oklahoma, Tennessee, Texas, Virginia and West Virginia. In addition, AEP operates one of the world's largest transmission and distribution systems, with more than 38,000 circuit miles of transmission lines and more than 186,000 miles of distribution line.

Like most power companies in the United States, AEP generates a significant portion of its electricity through the burning of coal. That means the company faces increasingly strict government regulations aimed at limiting harmful emissions, including the EPA's new Clean Air Mercury Rule (CAMR). In response, the company is making substantial investments in new continuous emission monitoring systems (CEMS) at more than three-dozen of its plants. Products from Weed Instrument Co. play a significant role in the reliable operation of those monitoring systems by isolating monitoring equipment from potentially destructive power surges.

Mercury is a toxic, persistent pollutant that can be transported thousands of miles through the atmosphere and into waterways, where it makes its way into the food chain. In 2005, the EPA responded to the problem by issuing the CAMR, which is intended to cap and gradually reduce mercury emissions at coal-fired plants. The first-phase cap, which takes effect in 2009, mandates a reduction of mercury output nationwide from the current estimated level of 50 tons annually to 38 tons. The second phase, due in 2018, is intended to reduce emissions to 15 tons.

AEP plans to reduce its mercury emissions by 55 percent by 2010, primarily as a byproduct of its catalytic reduction of nitrous oxide and flue gas desulfurization process for removing sulfur dioxide. To track its progress, The company's new CEMS are part of a \$3.6 billion investment by AEP aimed at controlling all harmful atmospheric emissions and are designed to closely monitor the amount of mercury emitted from plant smokestacks. By doing so, AEP utilities will be able to accurately account for its mercury emissions to the EPA and state regulatory authorities. In addition, the system will provide AEP with data necessary to participate in a "cap-and-trade" exchange that provides flexibility in meeting the regulations.

Phil Sawich, an AEP senior engineer in charge of the CEMS project, explains that the federal rules are written in such a way that the best companies can do is "break even" in meeting federal limits. "The more accurately you can measure your mercury emissions, the closer you'll come to that point, and you won't have to surrender excess allowances," he says.

The CEMS consist of gas sampling probes - one per flue - in each of a plant's smokestacks. Smoke is drawn into a sampling line, which is heated to 350 degrees, and presented to an analyzer, which then detects the amount of mercury in the stream. In addition, the systems comprise calibrators and Supervisory Control and Data Acquisition (SCADA) systems for used in the monitoring and archiving of readings. The SCADA systems are housed in shelters being constructed at ground level near each of the smokestacks.

**The towering smokestacks - often the highest points for miles surrounding the plants - are natural targets for lightning strikes. Consequently, AEP's system design calls for electrical isolation of sensing devices from the rest of the CEMS through the use of fiber optic cabling. As part of its solution, AEP selected Weed Instrument Co.'s EOTec 2000 Modular Multiplexer for signal conversion. The EOTec 2000 Multiplexer is a bi-directional device capable of sending and receiving up to eight channels of data over a pair of fiber optic cables. A selection of modules, such as 4-20 mA, 0-10V, dry contact closure and RS-232, is available for flexible system configurations.**

**The AEP mercury monitoring systems will use the modules in delivering from four to six separate signals from the sensing points, including 4-20 mA analog signals and contact closures. Being able to bring all of the signals into the SCADA system on a single pair of fiber optics cables helps AEP reduce project costs, simplify systems and improve reliability.**

**AEP is a longtime user of Weed Instrument Co. products, a factor in the company's selection of the EOTec 2000 Modular Multiplexer, says Philip Sawich, senior engineer in charge of the CEMS project. "We've been using Weed Instrument products on our monitoring systems for about five years, and we have been very happy with their accuracy and reliability," he adds.**

Because the measurement and control of mercury emissions represents relatively new technology, Sawich refers to AEP's efforts, including the CEMS, as "an ongoing project." The company plans call for certification of the systems to begin in January 2008 - a year before the mercury regulations take effect. He also cites continuing development of new devices, such as an oxidized calibrator, that will be added to the systems as they are fully tested and evaluated.

If all goes as planned, the systems will play an important role in AEP's mission of providing a plentiful supply of power to its customers in an environmentally responsible manner.