

Case Study

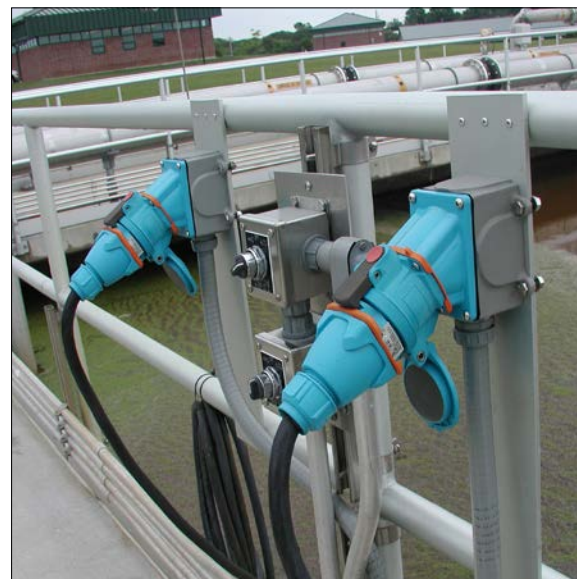
Wastewater Plant Plugs into Savings and Safety

A Wisconsin wastewater treatment plant is saving time with a combination plug/receptacle and disconnect switch that makes motor and generator connections safe, fast, and easy, at the plant and lift stations around town. The MELTRIC Switch-Rated motor plug allows workers to safely make and break electrical connections, even under full load, and also provides the NEC-required "line of sight" disconnect.

The \$23.6 million plant serves Watertown, Wisconsin, a city of about 23,000 located midway between Milwaukee and Madison on the Rock River. It replaces an earlier plant and was completed in 2004. The 5.2 mgd facility is expected to accommodate future growth well beyond the next 20 years and is located on a 40-acre site that will permit additional future expansion.

During construction of the plant, submersible mixers in the aeration basins were hard-wired. Shortly after operations began, one of the mixers had to be replaced, which put the tank out of service for about a day while the mixer was disconnected and a new one re-wired. About the same time, Jim Arndt, a department maintenance technician, saw MELTRIC receptacles at a trade show and suggested installing them on the mixers to prevent delays on future mixer replacements. As a result, the facility installed DSN30 (30A, 480V, 10 HP rated) plugs and receptacles on all its aeration tank mixers. These devices allow the mixers to be connected and disconnected safely with plug-and-play simplicity. Now, mechanics can easily replace or service the mixers without needing an electrician, and without the need for cumbersome PPE (personal protective equipment), as required by NFPA 70E. Assistant Water Systems Manager-Wastewater Kevin L. Freber explains, "When the first mixer failed, we had to shut everything off and disconnect all the wiring before we could pull it out and drop in a replacement. If one failed on a weekend, the weekend staff couldn't handle it, so we either had to wait until Monday or call in an electrician. Now we just pull the plug, crank the mixer up and plug in a new one. We're ready to go in minutes, and there's never any exposure to live power."

Disconnecting a motor is a simple operation that is initiated by pressing a pawl on the MELTRIC connector, which causes it to break the circuit and eject the plug to its rest position. Then, a simple quarter-turn of the plug allows it to be totally withdrawn from the receptacle in complete safety, since the circuit is already dead. When the plug and receptacle are separated, a safety shutter prevents access to live parts.



This closeup shows MELTRIC Connectors for two adjacent mixers. Pressing the pawl on top of the device disconnects the power safely before the plug and receptacle can be separated.



Connecting a generator to the lift station is fast, safe, and easy, and an electrician is not required at the jobsite. When disconnected, the plug's dead-front construction keeps workers safe by preventing accidental contact with live parts.

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The MELTRIC spring-loaded, silver-nickel butt-style contacts provide consistently superior electrical performance over thousands of operations and are resistant to wear, corrosion, oxidation, and other factors that contribute to premature failure of pin and sleeve-type devices. Freber confirms that the silver-nickel contacts used in the devices stand up well to the corrosive gases in the plant. "They have been online for more than a year without any problems," he states.

Safer and Faster Lift Station Connections

Success with the aeration basins led the utility to equip its portable emergency generators and remote lift stations with similar connectors.

While some lift stations are equipped with stationary generators to provide emergency power, a power failure can make it necessary to bring the department's portable generators to the other lift stations and connect them to power the pumps until service is restored. Previously, these stations were equipped with conventional pin and sleeve connectors. However, they could not be locked easily to prevent tampering or injury to children or vandals who might try to remove the plug. Freber says, "The generators deliver 100A service, and with the plugs we had before, there was no way of locking the two parts together. Any child could walk up and pull it apart."

Freber points out that the MELTRIC connectors are easy to lock to prevent tampering and also are safe when separated. He states, "You have to twist it to open it, and even if someone could get it apart, they could never get at the live contacts." This is due to their dead-front construction and enclosed arc chambers. Easily accessible contacts on the previous connectors had the potential to expose workers or others to live power, so switching to MELTRIC Switch-Rated plugs and receptacles also helped the utility enhance user safety and prevent accidents.

Arc flash can be a concern when it becomes necessary to switch power connections, but the city's lift stations that use mobile generators for emergency power are constructed to minimize or eliminate this risk. Freber says that wiring typically comes up from the pump into the bottom section of the control panel, which is constructed so that the related starters and other electronics are segregated in a sealed area. He explains, "Because of the new arc flash laws, we have them separated so our technicians can open the outside panel without danger from arc flash. There is also a walking beam inside, so when we switch from city power to emergency power, the power can't back feed. Using MELTRIC to connect to the generator with this arrangement we can switch safely from city to emergency power." Now, it takes only minutes to connect a generator and begin pumping. The ability to connect or disconnect quickly and safely makes it easier to move generators around to various lift stations for monthly test runs, or if necessary, during a prolonged or widespread power outage. Using MELTRIC Switch-Rated plugs and receptacles provides unmatched safety and saves the plant time and money.



Unlike pin and sleeve devices, MELTRIC Switch-Rated devices can be padlocked in the on or off position to eliminate the dangers of tampering.