News | May 23, 2017

Water Treatment Systems Turn To Ruggedized Fiber To Protect Against Disruptive Threats

Upgrade from copper to fiber optic cabling helps water treatment plant fend off lightning strikes, gnawing animals, environmental toxins, and other threats that can interrupt critical communications and control in remote locations

Given the demands of an ever-increasing population and, in some regions, worsening drought conditions, water districts today are increasingly developing alternative water resources to supplement what has traditionally been a heavy reliance on groundwater.

These alternative sources can include surface water from canals, rivers, or lakes and even saltwater treated by a desalinization process.

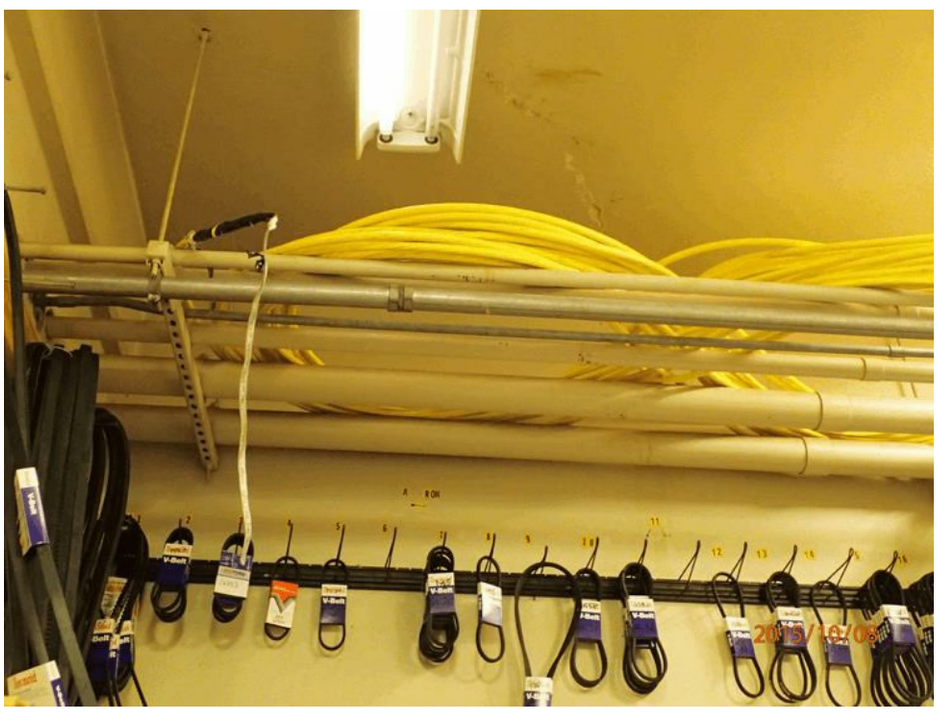
Complicating matters, however, is that managing multiple water sources is like conducting an orchestra. Knowing which sources to draw from that day—and how much—is often based on variables such as the amount of recent rain, current water levels, and even annual average pumping limits.

To do this, treatment plants must install sophisticated communication and control systems, not only within the plant itself, but also in remote areas such as remote wellfields or bodies of water.

There, the equipment and cabling is exposed to all manner of unexpected threats ranging from lightning strikes, to gnawing turtles and gophers, environmental toxins in the soil or water, and even potential vandalism or security breach.

As such, installers must pay particular attention to the type of cabling—often a choice between copper and fiber optics—as well as the type of "jacketing" that protects the strands of fiber or glass.

Concerns of this kind recently drove the Tampa Bay Regional Surface Water Treatment Plant to upgrade from PE-89 outdoor direct burial copper cable to fiber optic cable.



Tampa Bay Regional Surface Water Treatment Plant

Since September 2002, Tampa Bay Water's surface water treatment plant skims water from the Tampa Bypass Canal, Hillsborough, and Alafia rivers, when available. Some of that water is treated for immediate use at the Tampa Bay Regional Surface Water Treatment Plant, and surplus water is stored in a local reservoir.

YOU MAY ALSO LIKE...

Meeting The Communications Challenges Of Harsh Water/Wastewater Treatment Plant Environments

Using ruggedized fiber optic cable, connectors and enclosures can ensure that network communications run reliably at high speed — far into the future.

Ozone Disinfection System Provides Second Stage Treatment For Water Treatment Plant

Tampa Bay Water's state-of-the-art surface water treatment plant has provided high-quality drinking water to the Tampa Bay region.

Tampa Bay Desalination Plant Achieves Performance Milestones

Tampa Bay Water, American Water, and Acciona Agua announced recently that the Tampa Bay Seawater Desalination Facility, the largest seawater desalination plant in the U.S., has passed the final two performance milestone tests.

Desalination Plant Delivering Clean Drinking Water To Tampa Bay Region

As dry conditions are forecasted to continue in the southeastern United States, 2.4 million west-central Florida residents are benefiting from a project pioneered by their regional water utility, Tampa Bay Water. The Tampa Bay Seawater Desalination Plant, now fully operational, is providing millions of gallons of clean drinking water from the sea every day

Treatment Plant Discovers Fountain Of Youth, Long-Range Regulatory Compliance

An old (but important) drinking water facility finds new life through treatment upgrades, enabling compliance with strict water-quality regulations well into the future.

Large Florida Utility Switches To Innovyze Smart Water Technology

Renovated Regional Reservoir Gets Green Light To Resume Normal Operations

Russian Power Plant Saves 1.3 Million Gallons Of Water Annually With GE Corrosion Inhibitor

Coastside County Water District, California Drives System Reliability And Sustainability With Microclor® On-Site Hypochlorite Generation, Encore® Metering Pumps And PolyBlend® Polymer Activation

Community Invited To Help Plan For Future Water Supply

Membrane Trust: A Solution To Capacity And Contaminants

East Meets West: Capitalizing On Water Opportunity In Southeast Asia

The surface water is treated through a three-stage process that begins by removing the color and particles from the water, disinfecting it with an ozone treatment to kill microorganisms, and then filtering it. The water is then disinfected a final time before it is blended with other water supplies and distributed.

The plant was expanded in late 2010 to produce an annual average of 99 million gallons per day (mgd), enough to meet 50 percent of the region's drinking water needs.

In addition to the surface water, the plant continues to draw water from a groundwater source, the Floridian Aquifer, where they are permitted to withdraw an annual average of 120 million gallons per day (mgd) from 13 wellfields located in several nearby counties.

To promote environmental recovery, 11 of the wellfields operate under a permit that recently lowered the annual average pumping limit from 192 to 90 mgd.

Finally, a desalinization plant provides an additional 25 percent of the required drinking water.

To manage the production at the regional wellheads, Tampa Bay Water carefully monitors the environment in and around the area. Groundwater production is also shifted in response to climatic and environmental factors.

"This is where the communication and control comes into play," says Robb Olsen of BCI Integrated Solutions, a company that specializes in cable installation. "They have to be able to generate their readings, as to how much water their wells are pumping, and then be able to turn the pumps on or off as needed."

According to Olsen, Tampa Bay Water opted to upgrade to more ruggedized fiber optic cabling after experiencing ongoing issues with the aging copper wire installed fifteen years prior.

One of those concerns is related to lightning strikes that can break down communications and signaling. Lightning is such a regular occurrence in Tampa Bay that many refer to the city as the lightning capital of the country.

"The copper cable was attracting lightning," explains Olsen. "The strike doesn't just affect the copper; the electrical charge can travel to connected equipment and destroy it."

Cattle also roamed the property, along with tortoises and gophers that often chewed on the insulation.

"Because the local animal population was flourishing, this caused a problem," says Olsen. "The animals were biting into the cables. This would cause more damage when copper was used."

In fact, to install the new fiber optic cabling, BCI Integrated had to work with local environmental groups prior to installation.

In addition to these site-specific concerns, there are other potential disadvantages to copper.

These include electromagnetic interference says Bill Prall, RCDD, sales engineer with Tampa's Electric Supply Inc., a local distributor of electrical and low voltage products for necessary upgrades, including this project.

"A lot of electromagnetic interference is picked up on copper," says Prall. "Fiber optic technology is not susceptible to such interference. An operator can control valves quickly without having to worry about the system not doing what it is supposed to be doing."

Prall says that for this project they recommended DX Series distribution cable from Optical Cable Corporation (OCC), as well as the company's RTC and WTC series of reliable and robust enclosures.

OCC pioneered the development of tight-buffered cables for the most demanding military field applications in the early 1980s. OCC's ruggedized tight-buffered fiber cables offer exceptional physical characteristics, including bend, crush, impact, and chemical resistance across a broad thermal operating range.

Much easier to work with than its counterpart, "loose tube" cable, plenum-rated tight-buffered cable is designed for use indoors and outdoors, and overcomes the need to make splices, thereby enabling a much cleaner and quicker installation. When installed, this cable design requires only an easy termination.

"Fiber optic products offer the highest degree of protection," explains Prall. "The primary goal is to protect the integrity of the system."

With the fiber cabling now installed, the need for maintenance and upkeep has dramatically decreased.

"With the copper, I used to get service calls on a regular basis about that wellfield," adds BCI Integrated's Olsen. "Since the upgrade [to fiber optic cabling], I have not yet had to return—except to install more fiber."

For more information, visit www.occfiber.com.

SOURCE: Optical Cable Corporation