

CPFL Piratininga Energizes 3M ACCR to Upgrade Transmission Line Without Disrupting Densely Populated Community

3M Conductor Lets CPFL Energia Unit More than Double Capacity In Urban Right-of-Way Without Erecting Larger Towers

CPFL Energia's power distribution unit, CPFL Piratininga, has installed and energized the 3M Aluminum Conductor Composite Reinforced (3M ACCR) as part of an upgrade on a key transmission line serving a densely populated area in São Paulo state, more than doubling the capacity of that line without requiring larger towers.

Use of the light-weight, low-sag conductor in place of a conventional steel conductor enabled the utility to increase power transmission along a narrow right of way immediately surrounded by residences, without disrupting residents or causing potentially costly delays.

CPFL Energia serves some 6.5 million customers in four states, with a generating capacity of 1,672 megawatts, which is expected to grow to 2,174 megawatts in 2010, as the result of a vigorous expansion program.

The 3M ACCR conductor was installed on a 3.3-kilometer (slightly over two miles) line segment passing through a residential district of Várzea Paulista, a municipality of about 110,000 residents, some 40 kilometers (25 miles) northwest of the city of São Paulo. The 88kV double-circuit line boosts the power supply to Várzea Paulista and nearby Jundiaí, which has a population of more than 320,000.

"We studied several options and decided that 3M ACCR provides the most reliable, cost-effective solution for delivering more power through a dense neighborhood without creating numerous logistical problems," says Paulo Ricardo Bombassaro, engineering and planning manager for CPFL Energia. "We were impressed by its high-performance results in other applications where new tower construction was undesirable. We also were pleased that our transmission line installation process went very smoothly and everything is working as designed."

CPFL Energia is the second Brazilian utility to install the breakthrough conductor. In February of this year, Companhia de Transmissão de Energia Elétrica Paulista (CTEEP), installed the 3M ACCR to upgrade an environmentally sensitive river crossing, also avoiding new tower construction while boosting transmission capacity.

Overall, the new 3M conductor is now in use by some two dozen utilities in the United States and five other nations on three continents.

"There is growing recognition around the world that 3M ACCR is a genuine problem solver, a readily available, proven, cost-effective way to avoid the multiple risks that accompany tower construction, permitting and right-of-way expansion in certain areas," says Tim Koenig, director of the 3M High Capacity Conductor Program.

3M ACCR's strength and durability result from its core, composed of aluminum oxide (alumina) fibers embedded in high-purity aluminum, utilizing a highly specialized and patented process. The constituent materials can withstand high temperatures without appreciable loss in strength, even over long periods of time.

3M ACCR was developed with the support of the U.S. Department of Energy, which tested the conductor at its Oak Ridge National Laboratory (ORNL) in Tennessee, and with early contributions by the Defense Advanced

Research Projects Agency. The ORNL tests demonstrated the conductor retains its integrity after exposure to temperatures even higher than the rated continuous operating temperature of 210 degrees Celsius and the emergency operating temperature of 240 degrees Celsius. It has the durability and longevity of traditional steel core conductors, even when operated continuously at high temperatures.

Also, since 3M's ACCR is based on aluminum, it is not susceptible to environmental conditions such as moisture or UV exposure, like other traditional conductors, and it has the corrosion resistance typically associated with aluminum-based conductors.

3M holds 18 patents on its ACCR technology, which has been recognized by *R&D Magazine* with an R&D 100 Award as one of the most technologically significant products introduced into the marketplace, and by the Minnesota High Tech Association with a Tekne Award for innovative development.

3M ACCR is offered by 3M's Electrical Markets Division (EMD), which designs, manufactures and markets products for electrical utilities, electrical construction and maintenance, and electrical/electronic device manufacturers. EMD has more than 60 years of experience serving utility customers with highly reliable products, including high-capacity transmission conductors; power cable splices and terminations; electrical wire connectors, terminals and tools; wire marking products; cable ties; electrical insulating tapes; electromagnetic shielding and absorbing materials; heat shrinkable tubing and molded shapes for electrical insulation; and cold shrink sealing and insulating tubes.

More information about the 3M high capacity conductor is available at www.3M.com/accr.

About 3M

A recognized leader in research and development, 3M produces thousands of innovative products for dozens of diverse markets. 3M's core strength is applying its more than 40 distinct technology platforms – often in combination – to a wide array of customer needs. With \$25 billion in sales, 3M employs 76,000 people worldwide and has operations in more than 60 countries. For more information, visit www.3M.com.

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