

Major Brazilian Electric Utility Installs 3M ACCR, Boosting Power to São Paulo Without Larger Towers

Utility Is Brazil's 5th to Deploy Low-Sag Conductor to Double Capacity but Leave Infrastructure Unchanged; Upgraded Line Parallels Busy Highway and River

Using the 3M ACCR overhead conductor, a transmission line carrying electricity through a congested portion of São Paulo, Brazil's largest city, was upgraded by AES Eletropaulo to more than double its capacity without the need for larger towers or an expanded right of way.

AES Eletropaulo, a unit of AES Corporation, is the largest electricity distributor in Latin America, serving some 6.2 million customers, or more than 20 million people, in the greater metropolitan area of São Paulo City, the world's seventh largest metropolis.

The utility becomes the fifth in Brazil, to deploy the light-weight, low-sag 3M ACCR (Aluminum Conductor Composite Reinforced) to avoid construction, logistical and permitting problems in densely populated urban districts and environmentally sensitive areas, such as wetlands and river crossings. The conductor also is in use throughout the United States and in Asia and Europe.

AES Eletropaulo has installed 3M ACCR in a double-circuit, 88-138kV compact trapwire configuration on the Bandeirante-Itaim line that runs parallel to, and in between, the Pinheiros River and the busy Marginal Pinheiros, a main highway passing through São Paulo City. The region served by this transmission line is noteworthy for its economic importance, not only in São Paulo, but in Brazil as a whole.

According to the utility's engineering manager, Ithamar Sene, building larger towers to support a conventional steel conductor upgrade would have posed potential problems related to both highway traffic disruption and disturbance of the adjacent river bed. "3M ACCR offered the best solution for completing this important project efficiently and economically, with minimum impact on the surrounding environment," said Mr. Sene.

By providing at least twice the transmission capacity of conventional conductors of similar size without requiring new or enlarged towers, 3M ACCR is helping utilities accommodate new demands being placed on the grid without encountering costly and problematic construction, right-of-way expansion or permitting issues.

Four other utilities in Brazil – Companhia de Transmissão de Energia Elétrica Paulista (ISA CTEEP), CPFL Piratininga, CPFL Paulista and EDP Bandeirante – have employed the 3M ACCR in upgrade applications that included river crossings and densely populated communities. Power companies in China, India, Canada and France, in addition to some two dozen U.S. utilities, also have embraced the 3M ACCR for similar applications.

Tim Koenig, director of the 3M High Capacity Conductor Program, says 3M ACCR's growing international use, "especially in those countries whose economies and need for electrical power are most rapidly expanding, indicates that this conductor has become the reliable first-choice solution for upgrades where new construction would pose social, economic and regulatory obstacles. It is a proven, dependable, versatile and technologically advanced problem solver."

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 that 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.

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

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

3M holds several 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.

The [3M Electrical Markets Division](#), based in Austin, Texas, designs, manufactures and markets products for electrical construction, industrial maintenance, utility and industrial power, and electrical and electronic components. EMD has more than 60 years of experience serving customers with highly reliable products, including electrical and electronic insulating tapes and papers; electromagnetic compatible products; power cable splices and terminations; high-temperature, low-sag transmission conductors; heat shrinkable tubing and molded shapes; electrical wire connectors, terminals, tools and lugs; wire marking products; cable ties; and electrical diagnostic and detection products.

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

About 3M

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About AES Eletropaulo

AES Eletropaulo distributes Power for 24 municipalities on São Paulo Metropolitan Área - including the city of São Paulo - which all together means more than 20 million people. Its concession comprises a 4,526-square-kilometer-area and corresponds to the most important socioeconomic region of the country, with 6.2 million consumer units. In consumption and revenues, Eletropaulo is the largest electricity distributor in Latin America.

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