



## Cost-Effectiveness Put to the Test

**Wireless operators and global OEMs who operate in regions with comparatively low average revenues per user (ARPU) understand pricing pressure all too well. Lower revenue, coupled with increasingly vigorous competition, brings closer scrutiny on capital expenses to keep profits robust.**

ensure quality of service for their customers. To help bring deployment costs down, especially in ARPU-challenged regions, Andrew Corporation developed a new line of corrugated HELIAX® coaxial cables, which use lower cost aluminum as the outer conductor instead of copper.



In India, for example, ARPU often hovers around \$10 or less, compared to the \$40 or more operators can expect in more mature markets. Indian wireless operators have to be especially cognizant of costs, but continue to require high quality RF path components to

To verify Andrew's aluminum cable would meet important performance benchmarks, a few Indian wireless operators, and their contracted OEMs and installers, tested Andrew's new 7/8 inch aluminum cable. Tower crews first took readings of already-hung copper

cables at four existing cell sites near Ahmedabad, Chandigarh, Panipat, and Delhi, then replaced the copper cables with new aluminum HELIAX cable and connectors, grounding kits, and Twist-Lok™ hangers. To help ensure proper installation for these tests and future deployments, an Andrew quality engineer instructed the tower crews on proper connectorization and hanging techniques before they installed the new cables. Once the crews mounted the aluminum HELIAX cable on the towers, RF engineers tested them to make a performance comparison.

Andrew's HELIAX corrugated aluminum cable delivered on its promise to perform comparably "out of the box" to all-copper HELIAX cable, meeting the wireless operators' Voltage Standing Wave Ratio (VSWR) requirements at all sites. VSWR is an important measurement in wireless networks that indicates how well power can be passed through the system. Intermodulation distortion (IMD) is another important measurement. IMD increases when the various radio frequencies that enter an RF cable run into physical imperfections in the transmission system due to component expansion, creep, and other characteristics. Inherent properties of aluminum can lead to continuously decreasing contact forces, which result in less desirable IMD levels. To compensate for this degradation, Andrew engineers designed a total system approach that utilizes Andrew's unique Positive Stop™ spring-based, continuous-force connectors,



*During the cable trial at Delhi, the installers noted that the Twist-Lok™ hangers were not universal as they would not fit horizontal mounting structures. Andrew's accessory engineers responded, creating a new hanger to support such applications.*

which will better preserve the cables' performance readings. Andrew guarantees its aluminum HELIAX cable for 10 years, as long as Positive Stop connectors are used as part of the system.

The new aluminum cables tested by Indian wireless operators all performed within allowed VSWR tolerances and remain deployed at the four cell sites. If they choose to deploy more aluminum HELIAX system solutions, the Indian operators could achieve significant cost reductions (typically 10-15 percent) while expanding cellular coverage. Aluminum HELIAX cable with Positive Stop connectors is a viable, cost-effective transmission line system solution that can help reduce capital costs of any wireless infrastructure project.