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Mobile Phones on the High Seas

There are no network towers in the middle of oceans. There are no phone lines trailing the international cruise ships that dot large waterways. But there are thousands of tourists making long-distance cruises every year. These travelers, like the hundreds of cruise line staffers onboard, have friends and family to call and jobs to check on, creating a need for more ways to make those important connections. In working with one of its customers, Telecom Italia Mobile (TIM) recognized this and came to Andrew Wireless Solutions to see what could be done.

"We saw that there were a lot of people on these cruise ships, thousands at a time usually, who are on vacation but want to stay in close touch with family and friends," said TIM's special projects leader. "We knew that providing our customers with wireless service would make them happy, provide us with a new revenue stream, and benefit the cruise lines, too."

Lack of Wireless Communication Means Lack of Convenience; Homesickness

Communications between vessels and the mainland are generally accomplished via satellite connections, but this means passengers must use—for additional costs and with less convenience—the ship's wired phones while onboard. In those scenarios, passengers are unable to receive wireless calls, nor can they simply use their mobile devices on deck or in their rooms to check or send messages.

Cruise ship workers also experience frustration at the lack of easy communications while at sea. A recent survey of 600 cruise workers by Navitas Telecom revealed that 90 percent have experienced problems in the past keeping in touch with friends and family[1]. Almost half of these workers ranked communications services as a top priority when choosing the company for which to work. Employees abandoning ship while at sea due to homesickness is not unusual. Employee retention in the cruise line industry is a common difficulty for this very reason.

Unique Locations Demand Tailor-Made Solutions

To alleviate these connectivity problems, TIM decided the cruise ship's satellite system could be used to backhaul wireless communications to the mainland, which would tap into TIM's core GSM network. But to ensure connectivity via handhelds, network equipment would need to be installed onboard, which would spread wireless signals across the ship's decks and down its many corridors. This system would have to operate mindful of the ship's unique power supply limitations, equipment installation restrictions, and aesthetic requirements.

Andrew product and systems engineers worked with TIM radio planning engineers to devise how such a system could work. They knew Andrew's ION™-B radio-over-fiber distributed antenna system was a good place to start, as its remote units could be connected in a low power environment, and it could support multiple frequency bands. This meant more passengers—as well as the ship's crew— would be able to access the system. In application, the ION-B system that the engineers devised works through small, unobtrusive antennas distributed throughout the vessel, which communicate with passengers' handheld devices. The antennas are linked to remote electronic units, which communicate via fiber optic cables to a master unit, which transmits and receives signals through the ship's tracked microwave antenna to a satellite in the sky. The satellite relays signals to and from TIM's satellite gateway in Italy, which ultimately interfaces into TIM's GSM wireless network.

"It wasn't a 'go install some antennas and cable and be done with it' type of project," said Marianna Fabbri, product line manager, ION-B, Andrew. "The maze-like design of a cruise ship made the system design challenging, the fact that you are using a satellite gateway added complexity, and the whole project made for a unique RF engineering challenge. Thanks to great teamwork between our engineers and TIM's, we created a sound technological solution."

Andrew Leads the Entire Installation Project

Once the ION-B based system was envisioned, it needed to be installed. Andrew acted as a complete turnkey project manager for TIM, who had sold the in-building solution to a European cruise line. Andrew oversaw the installation, testing, and final commissioning of the entire system, taking into account some unique requirements. For each of the 12 ships that have ION-B systems installed to date, a week's worth of installation needed to be done while the ship was out at sea with passengers onboard. The cruise line couldn't disrupt business operations for too long, so the installers and equipment needed to maintain a low profile. Final installation work and testing were done back in port.

Together with TIM, Andrew engineers devised a wireless coverage and capacity system that brings cellular signals to places they have never gone, generating more revenue for TIM, and improving customer experience on international cruise ships. Meanwhile, the survey by Navitas Telecom indicates cruise ship workers are already benefiting. Thirty-five percent of respondents said they have already used onboard mobile services, even though these networks are relatively new. Uptake is happening rapidly. There might not be cell towers in the middle of the ocean, but onboard certain cruise ships, you'd never know.

[1] Wood, Nick. "Totally Trivial: Content conundrum," October 3, 2007. http://www.totaltele.com/View.aspx?t=2&ID=95627 (accessed October 3, 2007)