



Case Study

The world's longest over-water, all-IP link

Ceragon builds a 241 km link over water to provide connectivity for the broadcast operator of Equatorial Guinea

Overview

RTV EG is the national broadcasting operator of Equatorial Guinea. Committed to providing the citizens of the country with high-quality broadcast services and full national coverage, RTV set out to build a reliable transmission network. While neither fiber nor satellite solutions could satisfy the operator's CAPEX and OPEX and operational requirements, microwave technology proved to be a truly cost-effective option. To connect two parts of the country, Malabo, the capital, with the continental area, the operator had to overcome a water path of 241 km requiring a high capacity, over-water link across the sea. Such an unprecedentedly long over-water path required special design expertise as well as field-proven microwave technology and equipment to ensure superior performance and uninterrupted broadcast transmission.

The Challenge

For many years, designing links over reflective surfaces has been a challenging task for microwave-transmission-path engineers. As water is a good reflector, the reflected wave can have different phase and amplitude compared to the line-of-sight wave resulting in multipath fading ultimately leading to a high quantity of errors and signal interruptions. In addition, layers in the atmosphere with different temperatures and humidities may cause ducting, a well-known phenomenon problematic in long radio paths. To address these problems and to deploy reliable communication links, engineers need to have extensive experience in designing over-water microwave links.

The Solution

Through its merger with Nera Networks, Ceragon can now employ over 60 years of experience in the field of microwave. With highly robust radios operating in the most extreme weather conditions on the globe, and with highly qualified engineering teams with the expertise to overcome the challenges of long, over-water paths, Ceragon has gained the reputation of a highly trusted transmission solution provider. Ceragon addressed the challenges of the RTV EG network and provided a reliable all-IP nationwide backbone that ensured the continuity of service for broadcast video and audio.

- Turnkey network solution - hardware, installation, commissioning and maintenance.
- Combination of smart link design with field-proven Evolution Long Haul radio to provide extra link margin for 241 km over-water link
- Evolution Long Haul radio with Combiner Space Diversity and different traffic protection schemes to provide reliable long distance links



Implementation

Ceragon delivered a turn-key solution providing field survey, frequency planning, installation and commissioning services. The project covered the entire territory of Equatorial Guinea providing a high-capacity broadcast backbone for the whole country and connecting the capital to the continental area via a 241 km link. This link is the world's longest all-IP microwave over-water link. Starting from Pico Basilé, the highest summit on the island of Bioko with an altitude of 3,011 m, it traverses 241 km of ocean surface to reach the destination tower in Monte Douba. Apart from using high performance radio, it was essential to provide high link margin to overcome the multipath fading effect and to ensure the best possible quality of the broadcasting service.

Radio network highlights:

- Native Ethernet Long Haul network
- 241 km all-IP link over sea
- 41 Links total
- Configurations and equipment: Evolution radio with Combiner Space Diversity
- All radios monitored by Ceragon's comprehensive network management system NetMaster NMS



About Ceragon

Ceragon Networks Ltd. (NASDAQ: CRNT) is the premier wireless backhaul specialist. Ceragon's high capacity wireless backhaul solutions enable cellular operators and other wireless service providers to deliver 2G/3G and LTE/4G voice and data services that enable smart-phone applications such as Internet browsing, music and video. With unmatched technology and cost innovation, Ceragon's advanced point-to-point microwave systems allow wireless service providers to evolve their networks from circuit-switched and hybrid concepts to all IP networks. Ceragon solutions are designed to support all wireless access technologies, delivering more capacity over longer distances under any given deployment scenario. Ceragon's solutions are deployed by more than 230 service providers of all sizes, and hundreds of private networks in more than 130 countries. Visit Ceragon at www.ceragon.com.

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