



# Identifying and Proving Uplink Interference with CellAdvisor™

Reducing tower climbs in the Himalayas saves time and increases safety



Recently, a PAN-India service provider completed a soft launch of LTE services with VoLTE in select areas. With over 125K base stations installed and in the process of commissioning, the provider is ready to launch a purely-LTE network without any circuit-switched fallback—and top-performing VoLTE, from the start, is a must.

## The Critical Business Challenge

The provider faced acute uplink-interference and VoLTE call-quality issues at multiple sites, many close to the mountainous Nepal border. There was as much as a 25% total capacity degradation in uplink, and throughput was also below benchmark threshold values. Their existing tools were unable to point out the root causes of the problem. As a result, they could not furnish credible proof to the Wireless Monitoring Organization (WMO) to take the matter to resolution.



Just as important, to record uplink interference, field technicians had to climb towers with directional antennas (50 m above ground). This method was risky, time consuming, and full of errors, as tower technicians are often not fully skilled at using spectrum analyzers. Moreover, in the depths of a Himalayan winter, climbing 40 or 50 m up a tower is nearly impossible.

## Finding an Answer

To solve the issue quickly, the team invited Viavi Solutions® to investigate, find interference sources, and provide the proof needed to initiate WMO action on the problem.

Viavi CellAdvisor base station analyzers offer cable, antenna, spectrum, interference, and signal analysis as well as RF/optical power meters and fiber inspection in a rugged, portable instrument. For this application, Viavi experts used the CPRI Interference Hunting feature along with an AntennaAdvisor directional antenna to monitor CPRI, spectrum, and RSSI.

To avoid dangerous tower climbs, the CellAdvisor RFoCPRI feature enabled connecting to uplink CPRI cables on the ground. One culprit turned out to be nearby Air Force radar beacon signals. Interestingly, the interference was previously undetectable at ground level, and could only be recorded at antenna height. Other interference came from far-away Nepalese towers, presumably transmitting WiMAX in the 2310-2315 MHz band.



CellAdvisor tapping the BBU-RRH CPRI link — all measurements are at ground level

## The Viavi Solution

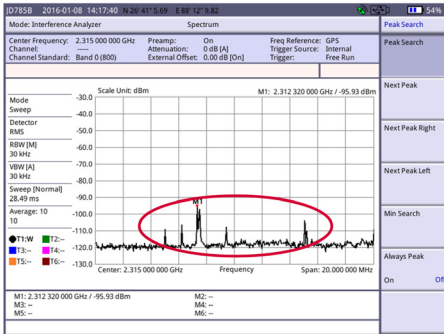
Eliminating the interference improved uplink network capacity by at least 20%. VoLTE call-setup success rates increased substantially and uplink throughput was raised by at least 50% in the TD-LTE band.

The provider found these CellAdvisor 785B features critically important:

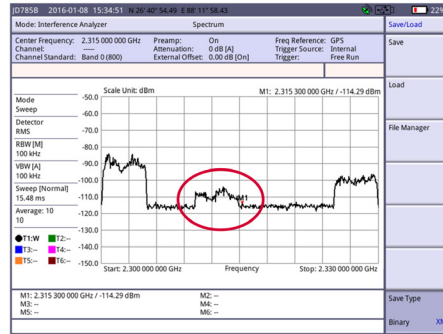
- RFoCPRI uplink interference analysis with spectrum, RSSI, and spectrogram
- Interference analyzer with AntennaAdvisor DF handle
- RFoCPRI TD-LTE signal analysis
- TD-FD LTE signal analysis (regular mode)
- Spectrum recording

Another vital benefit was avoiding tower climbs by monitoring the uplink spectrum from the ground with RFoCPRI.

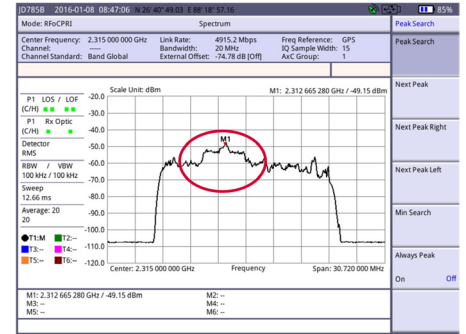
The team recorded clear uplink spectrum, RSSI, and spectrograms that not only showed high RSSI in the entire 20 MHz Channel bandwidth, but also clearly showed risen noise-floor peaks. This was the clear and credible proof the provider needed for the WMO.



Interference observed at ground level



Interference observed at nearby rooftop



Interference observed using RFoCPRI at ground level



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