

Case Study

Identifying and Locating Interference with CellAdvisor

Interference lowers signal-to-noise ratios (SNR) and reduces both coverage areas and throughput rates. Effectively analyzing the spectrum and identifying interfering signals ensures service coverage—but troubleshooting interference can be both challenging and time-consuming.

The Challenge

For several months, a tier 1 service provider experienced low, intermittent throughput issues at one their eNodeB sectors. Unable to identify the root cause, the provider replaced the RRH as well as fiber—to no avail. The performance issues continued.

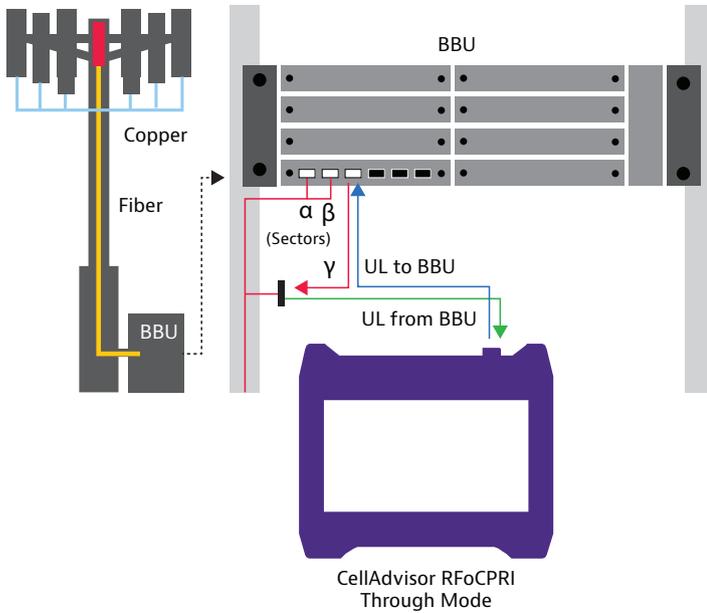
Identifying radio link issues quickly and easily challenges the entire RF industry. External issues elevating RX noise floors are most often interference. But when RX noise issues are improperly diagnosed, time to repair increases, expenses are incurred unnecessarily, and customers suffer. And the penalty for poor QoE is severe: it increases churn. Operators and providers need tools that isolate interference issues to quickly restore the best QoE for their end users.



The Solution

To find an answer, the operator's performance and operations team contacted VIAVI. Together, they isolated the performance issue at the cell site by:

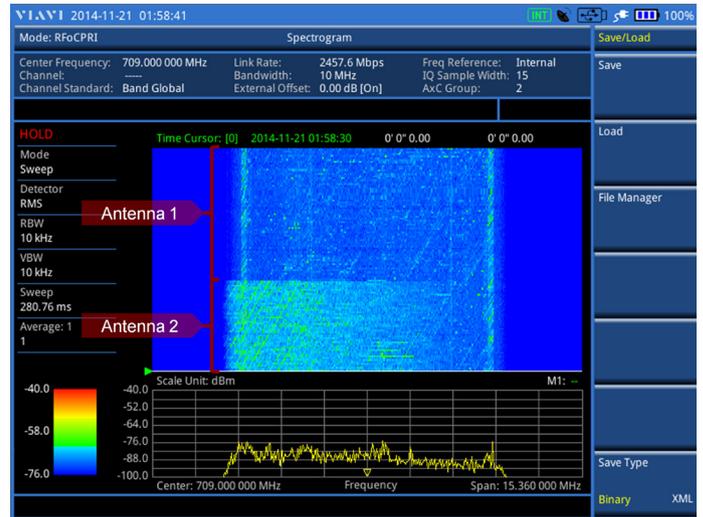
- Verifying sync between the digital unit and the RRH
- Inspecting and cleaning fiber
- Installing a fiber optic tap via the SFP and panel and performing RFoCPRI™ analysis



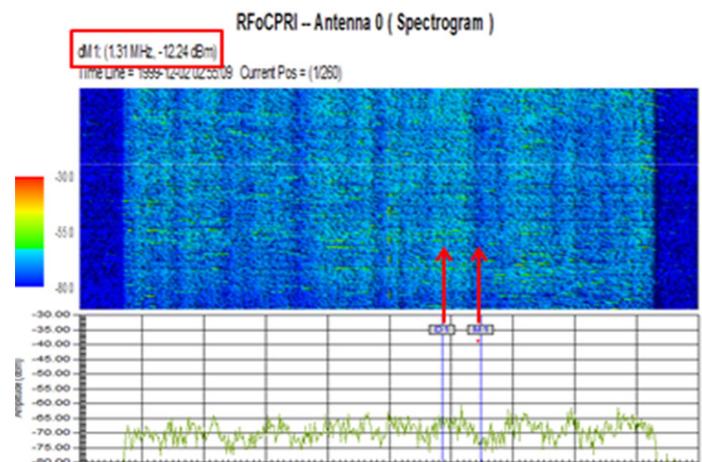
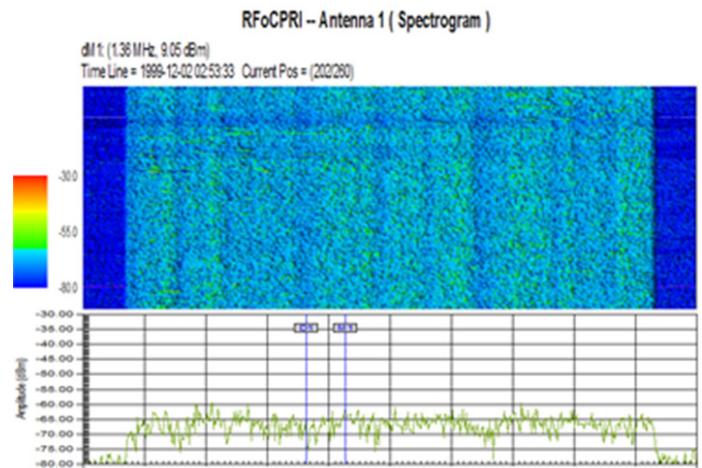
CellAdvisor RFoCPRI test architecture

Technicians on the ground connected the VIAVI Solution CellAdvisor™. It decoded RF information sent on the CPRI link from the RRH to the BBU and displayed those results in a traditional spectrum analyzer view. This clearly indicated that the uplink noise floor for that sector was higher than normal.

The cause of high uplink noise floors on remote radio heads (RRHs) can be either internal or external. Internal issues are often due to passive intermodulation (PIM) and, because most RRHs are inaccessible from the ground, repairing them is costly. In a typical PIM case, reviewing the spectrogram for abnormal noise levels will show a visible difference between two antenna measurements. In the case of external interference, both antenna links will show a noise rise.



Spectrogram result showing a PIM issue on antenna 2



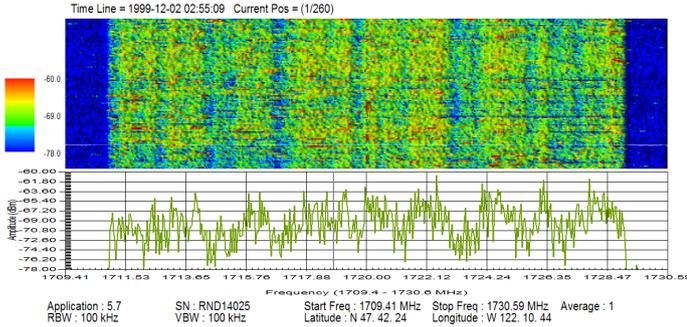
Comparative spectrogram results showing consistent interference on both antennas; note rolling rises in the noise floor across the whole band

Summary

Several kinds of licensed and unlicensed transmitters can generate interference signals that decrease service quality. Identifying, isolating, and eliminating this interference—quickly—is an absolute must for wireless service providers. In this case, remediation required just one test set that performed the following measurements:

- Fiber inspection
- RFoCPRI uplink measurements
- Interference hunting

CellAdvisor and its RFoCPRI capabilities give providers clear visibility of uplink spectrum, from the ground, to identify and mitigate interference sources. This decreases time-to-resolution and reduces expenses associated with unnecessary tower crew work.



CellAdvisor RFoCPRI result displaying RRH uplink noise

CellAdvisor is a powerful tool for detecting interference, significantly reducing the time it takes to identify issues. In this case, it identified external interference as the most likely culprit. Thereafter, just 3 hours of driving and walk-testing a nearby building identified the interference source: a misconfigured bi-directional amplifier located approximately 1,000 meters from the base station and unknown to the wireless service provider.



Source of interference