Adjacent Cell Site Interference When Installing In-band NB-IoT
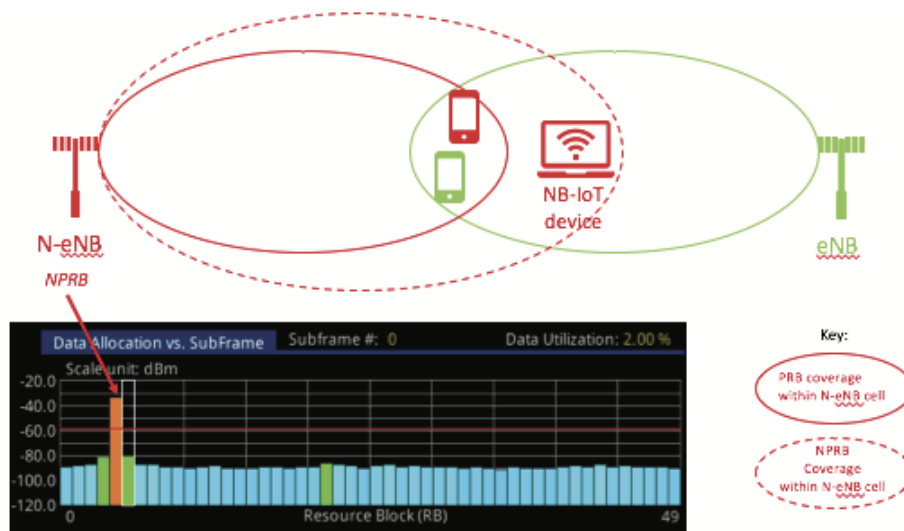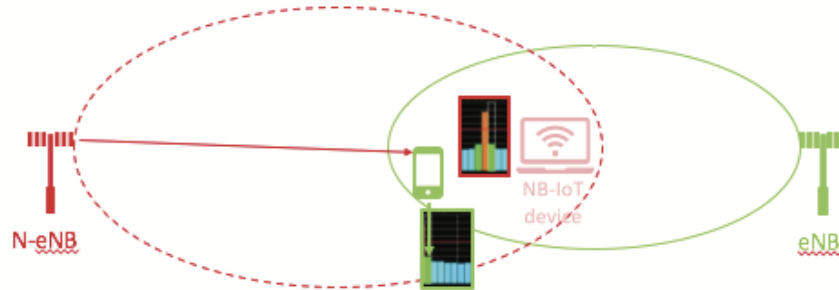
In a previous tip, we spoke of intra-Physical Resource Block (PRB) interference within the same cell site when installing In-band Narrowband Internet of Things (NB-IoT). In this tip, we'll take a quick look at how interference can come from an adjacent site and the best way to eliminate the problem. For this scenario, the NB-IoT cell site produces a signal with coverage that overlaps with another adjacent base station that is broadcasting a standard LTE signal as shown below.

Technicians should analyze any potential changes to the coverage area of the LTE base station when the NB-IoT signal service is activated from an adjacent base station and its associated PRB is actively transmitting.

Likewise, validate the quality of service being delivered from the NB-IoT base station to the IoT device that is located in the overlapping area between the two base stations. This will identify any potential interference issues from the LTE signal on the NB-IoT signal.

In this co-located cell sites example, another downlink effect to monitor is possible excessive levels of NB- IoT PRB power boosting being transmitted (also referred to as Power Spectral Density (PSD) boosting). This could produce a type of co-channel interference on neighboring user equipment when they are using the same, or even the adjacent, PRBs originated from the other LTE base station as shown below.

A similar situation of potential signal pollution could take place on the uplink path if the NB-IoT device originates an excessive level of PSD boosting or even an excess of signal repetition to better reach the base station for data transmission. This could result in desensitizing the adjacent LTE base station and could cause a significant decrease in the quality of service being delivered (similar to a near-far phenomenon).

For a more in-depth look at In-band deployments, read the white paper A Practical Guide for Field Testing NB-IoT.

Short on time? Read the blog post 3GPP NB-IoT Deployment and Optimization Challenges.

Products Used for Testing:

CellAdvisor Base Station Analyzer