

RF Survey for Establishing Better Long Term Evolution Network

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Abstract— To establishing a new BTS cell site and Tower in LTE Network there is need to find the best suitable place from where the tower will cover maximum area according to the need. For finding out the desired place there is a need of survey and that survey is known as RF Survey. After the RF Survey, tower installation takes place and after installation and optimization the tower is under working condition and serves the services to that desired place according to the need of customers. In this paper I concentrate in RF Survey part, their types, how RF Survey done and techniques.

Key words: RF Survey, Long Term Evolution Network

I. INTRODUCTION

RF Survey is carried out to find out best suitable position for BTS cell site and Tower giving best desired result for RF. RF survey is done after RF Planning. RF Planning data is created based on indoor outdoor coverage criteria in the circle where mobile services are to be provided. RF survey is important because it gives the visual details to the RF Planner. Based on these details RF Planner can create better model for providing better coverage.

A. Types of RF Survey

- New Town Survey
- Sharing Site Survey
- Capacity Site Survey
- Coverage Site Survey
- Cow Site Survey
- In Building Solution Survey
- Repeater Site Survey
- Line Of Site Survey

B. New Town Survey

This Survey is done a new tower and BTS has to be placed in a given position (nominal) planned by the RF Planner. And need to installed BTS and Tower in best suitable place in search ring.

Select three priority points in the search ring based on the following criteria

- AMSL
- Building height
- Availability of Electricity
- Distance from Nominal
- Road access

C. Sharing Site Survey

In this survey the tower is already exist, collect all existing and proposed data by RF Tools.

Data need to be collected

- Lat/Long
- AMSL
- Distance from nominal
- Tower Height, GSM/Microwave Antenna Height and Azimuth

- Existing Operator Name
- Panoramic photo of Clutter
- Sector photos of area covered by GSM Antenna
- Civil and Road Layout Designing

D. Capacity Site Survey

When the teledensity increases the load of the BTS increases due to which the performance of BTS decreases, to handle the traffic there is a need for installing another tower or BTS in that area.

Data need to be collected

- Lat/Long
- AMSL
- Distance from nominal
- Tower Height, GSM/Microwave Antenna Height and Azimuth
- Existing Operator Name
- Panoramic photo of Clutter
- Sector photos of area covered by GSM Antenna
- Civil and Road Layout Designing

E. Coverage Site Survey

Coverage Site Survey is done when coverage need to be provided at a particular area where coverage is not provided during new town survey.

F. Cow Site Survey

Cow Site Survey is done when teledensity increase at a particular place for a limited period of time. In Cow Site BTS and Tower is mounted in a moving vehicle, that vehicle can be placed at any place where coverage need to be provided for limited time period.

G. In Building Solution Survey

IBS provides indoor coverage using a series of hubs / equipments distributing the signals to number of omni direction antennas. The system is fed by centralized service inputs from a base station or repeater.

IBS gives adequate strength and quality to the wireless signals, hence assures smooth wireless communication for voice and data.

Following aspects covered in IBS Survey

- Site Survey
- Site Planning
- Implementation
- Supply
- Coverage testing

H. Repeater Site Survey

When the problem is arise in establishing a link between two towers then Repeater Site Survey is done. For removing this problem a repeater is between the two towers

I. Line of Site Survey

Line of Site Survey is carried out to have microwave connectivity between two sites to ascertain the LOS clearance. The microwave LOS survey is carried out physically checking the terrain between near end and far end and selecting the site for acquisition. This survey is very critical because any failure in LOS can cost heavy lost on account of providing infrastructure at site and delay in project.

There are three type of LOS Survey

- Blind Survey
- Backbone Survey
- Nominal Survey

1) Blind Survey

In this Survey either one of the location of near end or far end is not known, and there is a need to setup the link between near end to far end then Blind Survey is done

2) Backbone Survey

In Backbone Survey there is only one near end and multiple far end and link has to be established between all the far end to the near end.

3) Nominal Survey

In Nominal Survey there is only one near end and one far end, and check whether the link is clear or not

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II. RF TECHNIQUES

Using measurement data generated by real subscribers as well as the traditional network data sources, the LTE Network Optimization Service gives you the tools you need for hardware optimization, analysis of performance statistics, database analysis, call trace analysis, and frequency planning optimization. Now you can collect data from your entire network no matter which vendors' equipment you use and improve performance across the board, and automated analysis also means you get results with significantly shorter times.

III. NETWORK COVERAGE

An optimized network performs better and subscribers notice the difference. So you can achieve higher customer satisfaction by reducing the number of dropped calls, thereby increasing customer loyalty.

IV. CONCLUSION

The process of RF Survey is very important for establishing or expanding the mobile network. Without RF Survey it is difficult to decide which place is better for installation BTS Cell site and serve operator services. Not only for LTE Network but the upcoming network will also need the process of RF Survey to setup the Wireless Network.

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