

ABSTRAK

Kebutuhan akan komunikasi yang kuat dan handal tidak hanya terbatas pada lingkungan *outdoor*, tetapi juga sangat penting di dalam gedung. Faktanya, karena banyak aktivitas dan interaksi sosial, bisnis, dan keamanan terjadi di dalam gedung, ketersediaan komunikasi yang baik di dalam ruangan menjadi semakin penting. IBC *in-building coverage* berperan penting dalam memenuhi kebutuhan tersebut dengan menyediakan sinyal seluler yang kuat, konsisten, dan andal di dalam gedung-gedung besar.

Gedung Menara Bank Mega Syariah Jakarta adalah salah satu gedung perkantoran yang sudah terimplementasikan *indoor building coverage* multi operator seluler sebagai bentuk layanan jaringan seluler kepada penyewa/tenan gedung. Keunggulan jaringan multi operator seluler *Indoor Building Coverage* (IBC), bisa digunakan oleh operator Telkomsel, Indosat dan XL dalam 1 jaringan.

Untuk meningkatkan dan menjaga performansi jaringan IBC yang sudah terpasang lebih dari 10 tahun di gedung Menara Bank Mega Syariah Jakarta perlu dilakukan analisa perhitungan *link budget*. Dengan mengambil studi kasus operator Telkomsel & XL, melakukan pengukuran *RX Level* dan *RX Qual* untuk sinyal 2G, serta *Reference Signal Received Power (RSRP)* dan *Signal to Interference Noise Ratio (SINR)* untuk sinyal 4G. Metode *walktest mode idle dan dedicated*, menggunakan *software TEMS Investigation* versi 16.3.6, HP Nemo Samsung S5 G900i dan juga metode *spot check* sinyal *by mobile* aplikasi yang di *develop* sendiri. Dari hasil analisis dengan melakukan optimasi jaringan multi operator, dapat meningkatkan kualitas sinyal antena dengan persentase kenaikan rata-rata nilai EIRP untuk GSM sebesar 328 % dan LTE sebesar 903%. Sehingga layanan seluler di dalam gedung tetap terjaga performansinya.

Kata kunci : Multi Operator, *Linkbudget*, Optimasi, Aplikasi PM Antenna

ABSTRACT

Needs a strong and reliable communication, is not only limited to outdoor environments, but is also very important inside buildings. In fact, as many social, business and security activities and interactions take place inside buildings, the availability of good communications indoors is becoming increasingly important. IBC in-building coverage plays an important role in meeting these needs by providing strong, consistent and reliable cellular signals inside large buildings.

Menara Bank Mega Syariah Jakarta is one of the office buildings that has implemented indoor building coverage of multi cellular operators as a form of cellular network service to tenants / building tenants. The advantages of the Indoor Building Coverage (IBC) multi-cellular operator network, can be used by all cellular operators such as Telkomsel, Indosat and XL in 1 network.

To improve and maintain the performance of the IBC network that has been installed for more than 10 years in the Menara Bank Mega Syariah Jakarta building, it is necessary to analyze the link budget calculation. By taking case studies of Telkomsel & XL operators, measuring RX Level and RX Qual for 2G signals, as well as Reference Signal Received Power (RSRP) and Signal to Interference Noise Ratio (SINR) for 4G signals. The walktest method is idle and dedicated mode, using TEMS Investigation software version 16.3.6, HP Nemo Samsung S5 G900i and also the spot check signal method by mobile applications that are developed by ourselves. From the analysis results by optimizing multi-operator networks, it can improve the quality of antenna signals with a percentage increase in the average EIRP value for GSM by 328% and LTE by 903%. So that cellular services in the building maintained its performance.

Keywords: Multi Operator, Linkbudget, Optimization, PM Antenna Application