

ABSTRACT

The development of mobile technology has progressed rapidly and fifth-generation (5G) networks are currently the focus of the telecommunications industry. 5G technology offers ultra-fast internet, low latency, large capacity, and highly reliable connections. In this research, 5G network planning and simulation were conducted using Atoll 3.4 software. This network planning uses the 2300 MHz frequency in the Non-Standalone (NSA) scenario. The Citra Raya Tangerang area located in Cikupa District, Tangerang Regency was chosen as the focus area for this 5G network planning. The characteristics of users in this area are active using network services in buildings such as shopping centers, high-rise buildings and schools. To support service needs and high mobility for users, it is necessary to have adequate cellular network infrastructure. In this research, a simulation analysis of 5G network calculation and design is carried out in Atoll software. Before conducting network planning, Coverage Planning and Capacity Planning calculations of 5G networks are carried out to determine the value of the link budget and the required user capacity. Based on field surveys, there are 20 4G sites in the region which are then used in network design in Atoll software. The simulation results obtained the average value of the SS-RSRP parameter of -76.83 dBm with 6,006 users based on the number of connected users of 6,038. For the average value of SS-SINR, it is obtained at 18.42 dB with 5,301 users who have met the standard and as many as 737 users are still less than 10 dB. Users who get signal strength based on SS-RSRP parameters do not all have good quality, because it allows signal barriers received by users, while users who meet SS-SINR standards get signal strength and good quality as well. Therefore, the SS-SINR parameter is said to be more adequate to serve as the basis for 5G network planning compared to the SS-RSRP parameter.

Keywords : 5G , SS-RSRP, SS-SINR, *Coverage Planning* , *Capacity Planning*