

## **ABSTRACT**

*The development of cellular technology has grown rapidly and the fifth generation (5G) network is currently the focus of the telecommunications industry. 5G technology offers very fast internet, low latency, large capacity, and very reliable connections. In this study, 5G network planning and simulation were carried out using Atoll 3.4 software. This network planning uses a frequency of 2300 MHz in the Non-Standalone (NSA) scenario in the Batuaceper District, Tangerang City, the Batuaceper District area of Tangerang City was chosen as the focus area for 5G network planning because of the many industrial centers (factories and warehouses) shopping places and school facilities which are referred to as Urban City (busy areas) therefore it requires support for high service needs and mobility and adequate network infrastructure. Before designing a 5G network on the Atoll software, the initial step in the simulation process is to calculate Capacity Planning and Coverage Planning followed by simulation on the Atoll software which produces a result in the form of Synchronization Signal - Reference Signal Received Power (SS-RSRP) and Synchronization Signal - Signal to Noise and Interference Ratio (SS-SINR) parameters. Where the simulation results of the SS-RSRP parameters in the area are dominated by the color yellow which means that the value obtained by the user is "Good". The histogram results show a value with an average of -70.23 with a range of values -80 to -62 dbm. Where this value is included in the category "Good to Very Good" and the simulation results on the histogram display can be seen that the SS-SINR parameter has a range of > 10 db coverage of 8.04 km<sup>2</sup> with an average value of 10.42 db and is included in the "Good" category. And in the CDF Image results it can be seen that the analyzed area has an average SS-SINR value of 10.42 with a coverage of 8.04 km<sup>2</sup> with the category "Good to Normal". The SS-SINR parameter is said to be more adequate to be used as a basis for 5G network planning than SS-RSRP, this is because users who get SS-SINR parameter signals have good network quality and signal strength. Users who get signal strength based on SS-RSRP parameters do not all have good quality, because there are signal obstacles to being received by users.*

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