

## **ABSTRACT**

*The increase of current antenna technology means the use of single-band antennas has begun to be irrelevant because of the era of multiband antennas. In the world of telecommunications, GSM, DCS, and UMTS services work on different frequencies. This circumstances pushed the operators for a system that able to serve those services without having to increase the number of antennas on the tower, while maintain optimal coverage area. Until now, the operators still using single-band antennas for the majority of their sites.*

*In this final assignment the writer has created a system that uses a triple-band antenna for all serving sites in order to support the three services with optimal area coverage. Process of experimentation system includes propagation models tuning, replacing the existing antennas to triple-band antennas and experiments with new antennas characteristic by using drive test data and survey data owned by PT. Indosat, Tbk.*

*Experiments are simulated in South Bandung cluster consisting of 19 sites using a triple-band antenna model Argus CVVPX310R -BT1 with 43 dBm power and 1.5 dB total BTS loss for the entire sites. The experiments results of this system are a cluster with coverage area increased for 22.7% in GSM service and 11.9% in UMTS service, while coverage area for DCS service decreased by 10.9% compared to the existing condition. The amount of antenna used has changed from 118 antennas to 57 antennas, in which 10 of 19 sites are able to handle 53 new services.*

**Keywords:** *single-band antenna, triple-band antenna, coverage area, GSM, DCS, UMTS*