

ABSTRACT

Railway communications system currently uses one analog channel Very High Frequency (VHF) 167-168 MHz with 8 GHz. Jakarta traffic conditions require more than one channel. This problem solution by Terrestrial Trunked Radio (TETRA) with frequency 410-430 MHz, one TETRA transmitter provides four channels with one channel is used for control.

TETRA Network planning is done at stations (St.) Soetta-Halim passing through 13 stations with a distance of 43.9 km, TETRA communication occurs between the operational center with station and the locomotive. This planning using planning based on coverage method, to find the value of the parameter link power budget to determine MAPL and to get radius to determine the number of sites needed. Based on capacity planning methods, determine the number of TETRA users and the number of channels required to support erlang table B. Of these methods will be simulated using the software and the results are validated against the calculation.

Digital TETRA planning results in Airport Train Soetta-Halim requires 2 site, plotting locations on the St. Kalideres and St. Sudirman area meet the coverage radius. The results of signal level simulation the average entire the region is -65.79 dBm uplink and -54.45 dBm downlink, with the validation of calculations RSL is -103 dBm downlink and -97.85 dBm uplink where the value of the modulation signal level better results compared with the results of the calculation. The C/I simulation results of 18 dB which is approximately the calculation result is 66.25% downlink and 75.71% uplink. Mean number of server overlapping zone is 1.12, calculation result of Bit Error Rate 3×10^{-5} and on the side of backhaul link planned meet the clearance limit and no weaknesses signal received.

Keywords: TETRA, BER, C/I, planning based on capacity, planning based on coverage, backhaul.