ABSTRACT

The development of information and communication technology has currently experienced very rapid progress, which can be seen with the presence of Fiber Optic technology. However, in Indonesia, there are still many areas that have not received access to Fiber Optic services, one of which is Pegunungan Bintang Regency located in Papua province. This area has great potential in the agricultural and mining sectors which are very promising, but unfortunately access to Fiber Optic or Backhaul networks in the area is still very limited and inadequate. Therefore, it is very important to build an adequate Backhaul Fiber Optic network in Pegunungan Bintang Regency to support the development of these potential sectors and ensure that the benefits of advances in information and communication technology can be felt evenly throughout Indonesia, including in remote areas such as Pegunungan Bintang.

This study presents a comparison between data obtained from OptiSystem simulation designs and manual calculations. The system design was conducted with a transmission distance ranging from 65.62 km to 87.05 km. Based on the testing results, the power link budget values ranged from -23.024 dBm to -27.31 dBm, while the simulation results ranged from -14.641 dBm to -18.927 dBm. These values are still within the standard, above -28 dBm. The rise time budget values obtained ranged from 19 ps to 21 ps, indicating that the system's performance will not be disrupted, as the values are well below 70 ps. Therefore, it can be concluded that the performance of the designed network operates exceptionally well.

Keywords: *backhaul, gNodeB, fiber optic, STM-4, Backhaul*