

## **ABSTRACT**

*Long Term Evolution (LTE) technology or so-called Fourth Generation (4G) is now applied almost worldwide, including one in Indonesia. Equity of 4G / LTE network development began to be conducted in various regions of Indonesia, especially remote tourist areas such as Loksado, Kandangan, and Kalumpang district of South Kalimantan.*

*The design of eNodeB network is done by calculate the user traffic required based on population density to find out how the number and topology of eNodeB will be applied to the system as backhaul. On the distribution link using GPON technology and backhaul links using STM-16 technology which each has a bitrate of 2.5 Gbps. With the design of network links and the calculation of power budget link it can be simulated into Optisystem 7.0 to know the system is feasible or not.*

*The simulation results on the distribution link using GPON in Kecamatan Loksado, Kandangan, and Kalumpang get the get the worst value on the upstream for Q-factor = 17,0924, 15,6667, 17,357. BER =  $7,33 \times 10^{-66}$ ,  $1,12 \times 10^{-55}$ ,  $7,57 \times 10^{-68}$  and Power Received = -19,022 dBm, -19,757 dBm, -18,882 dBm. While the worst value on the downstream for Q-factor = 22,7433, 21,0777, 23,0496. BER =  $0,5,77 \times 10^{-99}$ ,  $6,6 \times 10^{-118}$  and Power Received = -13,022 dBm, -13,756 dBm, -12,881 dBm. The eNodeB network system on the backhaul link using STM-16 gets the worst value for Q-factor = 62,4385, BER = 0, and Power Received = -15,641 dBm with transmitter power of 3 dBm and EDFA gain of 6 dB.*

*Keywords: eNodeB, 4G/LTE, GPON, STM-16.*