ABSTRACT

In this modern era, telecommunications technology has been developed by offering the process of sending and receiving data at high speed and can reach long distances at low cost compared to sending data using copper. The technology is fiber optic cable. One technology of transmission technique using optical fiber is DWDM (Dense Wavelength Division Multiplexing) which utilizes light with different wavelengths as information channels.

In this final project, analyze the performance of Dense Wavelength Division Multiplexing (DWDM) Backbone Link Network from Tenggarong to Penajam Paser Utara as the area designated as the new capital city of the Republic of Indonesia, the length of the link from Tenggarong to Penajam Paser Utara is 234 km.

In the design and simulation process, parameters such as input parameters include bit rate, bandwidth, and margin system. In addition, it also uses other parameters such as CW Laser, SMF optical absorption, EDFA, and also photodetectors. The largest Bit Error Rate value obtained from the simulation results is $8,21 \times 10^{-8}$ on channel 1, while the smallest Bit Error Rate value obtained from the simulation results is $1,85 \times 10^{-8}$ obtained from channel 2. Meanwhile, to obtain the ideal bit error rate, an SNR value ranging from 18 to 22 is required.

Key Word : *Dense Wavelength Division Multiplexing* (DWDM)