**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 8,21×10<sup>-8</sup> on channel 1, while the smallest Bit Error Rate value obtained

from the simulation results is 1,85×10<sup>-8</sup> 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)

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