ABSTRACT

In this digital era, the telecommunication technology in Indonesia grows rapidly, especially in transmission system. The example of transmission systems that is being developed is optical fiber communication system. One of optical fiber network systems is Next Generation Passive Optical Network (NG-PON2). NG-PON2 is a Passive Optical Network (PON) system with capacity of 40 Gigabit per second for downstream and 10 Gigabit per second for upstream, which apply recommended protocol stated in ITU-T G.989 series. In order to support NG-PON2 network system, Time and Wavelength Division Multiplexed (TWDM) could be implemented. TWDM is the combination of TDM and WDM technology.

In this final project, analysis is done on the influence of downstream and upstream wavelength in NG-PON2 network system by using TWDM technology. TWDM wavelengths will be compared with other wavelengths, which are used on G-PON and XG-PON systems. This is done to determine whether other than the TWDM wavelength can be used on this system. Differences in wavelengths between channel / channel spacing will also be analyzed. Differences in wavelengths between channels used are 50 GHz, 100 GHz, 150 GHz, and 200. GHz. Analysis performed by looking at the influence of wavelength and channel spacing on NG-PON network system 2.

Performance parameters used are SNR, Q-Factor, and BER. The results of the analysis through manual calculations and simulations show that XG-PON and G-PON wavelengths are feasible for NG-PON 2 network systems with TWDM technology although the performance parameter values are still below the TWDM value. The wavelength or channel spacing range does not significantly affect the value of performance parameters. This can be seen from the difference in the value of all performance parameters that have no significant difference or change regularly.

***Keywords**: Wavelength, NG-PON2, TWDM.*