ABSTRACT

Palapa Ring project launched by the government is currently focused in Eastern of Indonesia. This project is the construction of the backbone network using fiber optic that will connect major cities in Indonesia from Sabang to Merauke using ring topology. This topology is chosen because of the various aspects that support the realization of an effective network. While the selection of the fiber optic backbone network is chosen because the optical fiber has a wide bandwidth, thus allowing messages delivery on a wide range of services can be realized as well. PT.Telkom has built some small ring and big ring in Indonesia, but there are still some areas which construction is still in the form of plans and unrealized.

On this final project an optical backbone network that connects Makassar and Maumere will be designed. In general, the design process is divided into three stages that are forecasting, determining device and system testing. Forecasting is needed to determine how much bandwidth requirements up to 2039 in the region, the second stage is the determination of the necessary tools, then the last stage is testing system that has been designed. Given these two regions are separated by an ocean, then it is using a submarine cable communication system. The backbone network design takes several important parameters into account, both technical and non-technical parameter, as human activity and sea conditions linking the two regions as well as the testing of the power link budget, rise time budget and bit error rate which are parameters of system reliability.

The system design is capable of carrying bandwidth requirements of 481,707 Gbps up to 2039 using 3 fiber pair for each link that are Makassar-Baubau link and Baubau-Maumere link with total channel that takes as much as 49 DWDM channesl. The PLB resulting value is demonstrated by the results of the acquisition of power at the receiving end for each link that can be accepted by the photodetector sensitivity. RTB values generated under the NRZ encoding, the risetime value is 56,6417 ps for link Baubau-Makassar and 49,9018 ps for link Baubau-Maumere. BER analysis results indicate that the system has a value that meets the standards BER of 10^{-9}.

Keywords : Palapa Ring, *bandwidth forecasting, backbone, DWDM*