

## ABSTRACT

Currently PLN has an internal program called Aplikasi Pelayanan Pelanggan Terpusat. This program will process all customer data scattered across Indonesia centrally. However, to support this program, needs a reliable communication network. In eastern Indonesia, its geographical conditions of islands and mountains. If constructed of optical communication networks, it requires substantial investment. Communication network that can respond to this challenge is a communication network via satellite because it can reach remote areas and the performance is pretty good.

The first step in this final project is the determination of the coordinates of each remote sites. Then selected corporate applications, regional office use three applications, namely video conference, internet, and VoIP with a maximum of 2 Mbps data rate. While the branch office is internet and VoIP with a maximum of 1 Mbps data rate. This network uses FDMA-SCPC with C-band frequency due to wet tropical climate of Indonesia. Satellite used is Telkom-1. The analysis conducted in this design is the bandwidth consumption of DVB for inbound and outbound side, the minimum power that can be used for inbound communication, performance test hub, the resume the quality of connectivity to each region and branch office at the time of inbound and outbound, and utility consumption of bandwidth on transponder bandwidth.

Results of link budget calculations indicate that inbound and outbound communication in both region and branch office can be done in 16QAM modulation with  $(C/N)_{\text{sys}}$  ranging from 23-28 dB and  $(E_b/N_o)_{\text{sys}}$  ranging from 18-23 dB. When the power used is limited, communication network is still able to run the communication with  $(C/N)_{\text{sys}}$  of 13,7 dB and  $(E_b/N_o)_{\text{sys}}$  of 12,04 dB with QPSK modulation. Hub can transmit data rate of 15.750 kbps with QPSK modulation. The design sufficient to use a transponder because the bandwidth requirements for the entire remote is 11.564,95 kHz while the transponder bandwidth provided is 36.000 kHz.

**Keywords:** *DVB, link budget, Telkom-1*