

ABSTRACT

InaTEWS (*Indonesia Tsunami Early Warning System*) is *tsunami* early detection system in Indonesia that operated under the coordination of national institutions. Inabuoy is a *tsunami* early detection when the *tsunami* still in the middle of the ocean. The *tsunami* detected by ocean bottom unit then distribute the information to buoy then extend the information to read down station (RDS). Until now ocean bottom unit communicated with buoy through acoustic communication. However this system have great weakness, the buoy can't extend the information when it's being vandalism. *Tsunami* strike at 25th October 2010 in Mentawai was an example for this system weakness, at that time buoy still in maintenance caused by vadalism activity.^[24]

This research will designed fiber optic communication system for transmitted the information from ocean bottom unit to buoy by doing data extraction, determine the location, system design and design analysis by analyze the calculation result from link power budget, dispersion power penalty and BER.

From the design result that have been done we obtained, ocean bottom unit palced at $7.49^{\circ}\text{S} - 107.42^{\circ}\text{E}$ and buoy at $7.39^{\circ}\text{S} - 107.42^{\circ}\text{E}$. 15.59 km optical cable needed for this system with 14.17 km under the ocean and 1.41 km above the sea level. Link power budget analysis using P_T 0 dBm and -5 dBm resulting P_r -12.786 and -17.786 dBm, that still under the receiver sensitivity value, -24 dBm. Disperse calculation analysis can be seen where the dispersion power penalty value at 1.253×10^{-14} dB, wich use ω equal to 2.5×10^{-13} nm, and value as 106.76977 dB and 134.3739 dB for ω worth as 1nm and 24 nm, this indicate that the proper link design will come when we use ω equal to 2.5×10^{-13} nm then 1 nm or 24 nm. From signal quality examination we obtained BER equal to 0 , it means that the link have good signal quality.

Kata kunci : InaTEWS, tsunami, *link power budget*, disperse, BER