

## ABSTRACT

The improvement of human life quality as the effect of rapid technology growth has made an increasement in the needs of information services. In order to fulfill the demands, high capacity and performance of transmission systems are needed. Furthermore, optical fibres as a transmission media which is capable to accomodate high bandwidth requirement, is the correct choice to support high quality transmission systems.

Nowadays, the *development of optical transmission links* High Performance Back Bone ( HPBB) *of various region in Indonesia* is being extended in order to accomodate the availability of communication channels, which is able to handle high intensity of voice and data traffic. The existing network topology of Jawa-Bali-Mataram is *point-to-point*, so that if a trouble ocured at one particular point of the links, it may cause a serious degradation to the performance of whole links .

On the other hand, Jawa - Bali - Mataram HPBB which connects backbone network of Sumatra, Jawa, Kalimantan, Denpasar dan Indonesia Bagian Timur, is established as the main pathway of SLI 007 and SLJJ voice traffics, fixed wireless access, data packets, and *Leased Channels* traffics. Therefore, an alternative route are needed to accommodate bandwidth requirements and to anticipate traffic loss caused by *point-to-point* configuration.

In this Final Assignment, an optical submarine cable transmission system connecting Jawa – Bali - Mataram will be designed to accommodate channel demand up to 2011 by using *Dense Wavelength Division Multiplexing* (DWDM). The design design would be implemented in comparisoin with G. 652 fibre and G. 655 fibre include *link power budget* and *rise time budget* calculation analysis, optical fibres route planning, and the selection of suitable technology and supporting optical equipments. Moreover, the characteristic of DWDM technology will be analyzed. It is hoped that the needs of an efficient route with high quality and performance can be achieved.

**Key word : *Dense Wavelength Division Multiplexing* (DWDM), optical fiber**