

## ***ABSTRACT***

A lot of users and operators that use CDMA with its variance need improvements in quality to increase the given services to keep to loyalty of the users to use the telecommunication product. Indonesia as the higher growth CDMA users at South East Asia with PT Telkom as a market leader that has almost 18,161 millions user by 2010 is also has some trouble in the services.

In voice communication, the higher complain due problem of incoming/outgoing can be influenced by improper at transmission and power process. Because of energy crisis issue, to overcome the problem needs a saving energy method that can use transmission technology that saving energy. Another issue that is consider at this Final Project is 4G which is tested by operators (Indosat and Telkomsel) and proved has better quality than CDMA (3G). By the issue, this Final Project also uses 4G technology in order CDMA is ready to compete in the market when 4G has been released for commercial usage.

To improve quality of voice performance for PT Telkom Flexi Division, Six Sigma can be used to improve the quality because Six Sigma is believed to achieve good goals such as at Motorola, Xerox, etc. this tool is used to reduce defect from transmission side (in this case, defect is call setup initialization failure).

Several combining systems are used to improve voice communication based on simulation with BER parameter. According to result of the simulation using Matlab, the lowest BER is achieved by MCDSCDMA-MIMO-STBC (0.015) or 4.46 Sigma. It is better than conventional CDMA with BER 0.08818 (for convolusional code  $\frac{1}{2}$  or 2.85 Sigma) and for convolusional code  $\frac{1}{3}$ , the graphic shows BER 0.07227 or 2.96 Sigma

Keywords : CDMA, *defect*, Six Sigma, BER, MCDSCDMA, MIMO, STBC