ABSTRACT

To monitor and protect the power system the energy flow is to be measure. To connect a meter, relay or other current sensing device in series with a large current source would be impractical.

Current Transformer is a device that has been around for a long time and will monitor the electrical power system. The current transformer is measuring device to determine current flow in a power system.

For the reliable and correct operation of the protection relays, the current transformer has to be carefully chosen. The distortion of the secondary current of a saturated CT may endanger the operation, selectivity and co-ordination of the protection. This dissertation proposing the selection of a CT, thus enables fast and reliable protection.

In this dissertation the calculation of the actual accuracy limit factor (ALF) for protection type (P) current transformer (CT) is described. First the calculation of the Voltage knee point and the burden of the CT, including connection wires and protection relay impedance, are presented. The scope of this calculation involves the cost, value and the safety of protection in power. The CT accuracy primary limit current defines the highest fault current magnitude at which the CT will need the specified accuracy. Beyond this level, the secondary current of the CT will be distorted, and this may cause severe effects on the performance of the protection relay. This dissertation is based on PMU PERLING substation and all the CT data are collected accordingly for calculation purposes. The

modeling of Current transformer containing 5 - CT Core 1 – Transformer Biased Differential Protection, Core 2 – Transformer High Impedance Protection, Core 3 – Back-up Distance Protection and Core 4 & Core 5 – High Impedance Busbar Protection (Main and Check) and used as for designing using GUI, MATLAB software.

The simulation of this has been investigated and the CT is suitable for this protection through any variable changes of 275/132KV auto transformer bay and line parameters. This modeling also shows the comparison between the transient analysis which proves according the CT Data at the PMU Perling Substation.

The modeling of CT was developed by using GUI, Matlab software and analysis of CT calculation and equation has showed the performance results. It can be concluded that the change of certain parameters will causes the CT to be adequate or inadequate of the protection system and CT has to be carefully chosen.