

Suwit Buapetch 2011: A Study of Stray Current in Mass Transit Rail Underground Structure. Master of Engineering (Electrical Engineering), Major Field: Electrical Engineering, Department of Electrical Engineering. Thesis Advisor: Mr. Winai Plueksawan, Dr.Eng. 183 pages.

This thesis includes a study of cause, affect and protection for stray current in the MRT underground system. The objective of study is to protect the MRT structure and other relevant structures that may be damaged. For example, the incidents, which occurred in the other countries, were the cases of leak in the underground gas and oil pipes. Moreover, there is a study of standard theory concerning the protection of stray current in the MRT DC system such as European Standard EN 50122-2, 1998. This case study is using the information details of the MRT Chaloem Ratchamongkhon Line in order to find out the way that reduces the potential value towards the structure. The methods of study are by adjusting the conductivity value per unit length between track and tunnel, the average current value of return rail, and resistivity of track per unit length with using additionally the forth rail in order to take the current back.

The result of study is to know the cause of stray current affected to the structure, and the protection method conformed to the standard. The values of calculation include : Comparison I: the potential value is 0.2131 V for referring to other calculation. Comparison II: adjusting the conductivity value per unit length between track and tunnel as 0.5,0.1 and 0.025 S/km, potential reduced to 0.1079 V Comparison III: adjusting the average current value of return rail as 1000A, 900A and 800A., potential reduced to 0.1705 V. Comparison IV : additionally the forth rail in order to take the current back, potential reduced to 0.1478 V. Finally, being adjusted according to hypothesis in different methods, the value of voltage is reduced. For the summary of research, not only the measurement of rail voltage which is used to protect the stray current can help us operate safely, but also it helps the system operator take this knowledge to apply for the MRT maintenance of this line and other lines.

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Thesis Advisor's signature