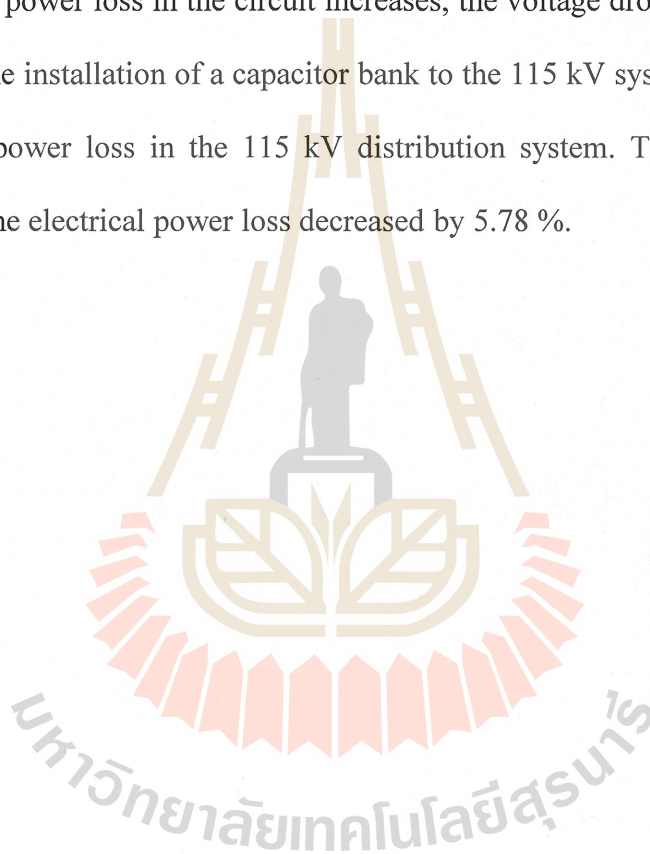


SUCHART TAOTHONG : IMPACTS OF KORAT LRT GREEN LINE TO
115 kV POWER SYSTEMS: A CASE STUDY OF MUEANG DISTRICT,
NAKHON RATCHASIMA. THESIS ADVISOR : ASST. PROF.
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DAILY LOAD CURVE /IMPACT /LIGHT RAIL TRANSIT /POWER SYSTEM

This study reports the impacts of the Light Rail Transit (LRT) system project in Mueang District, Nakhon Ratchasima province on the power distribution system of the Provincial Electricity Authority (PEA). The research objectives are (1) to analyze the power loss before and after supplying electrical power to the LRT system in 115 kV and 22 kV power distribution systems, and (2) to mitigate power loss in the 115 kV power distribution system. DIGSILENT Power Factory software is the simulation tool used in this study. The 115 kV system receiving electrical power from the Nakhon Ratchasima 2 substation station is used as the power distribution system data. Moreover, the LRT electric system loads are defined as 25%, 50%, 75%, and 100% of the power transformer rating installed in a 10 MVA, 20 MVA, and 30 MVA substations, respectively. In the current study, the 115 kV system was simulated before and after supplying electrical power to the LRT system load at the DEPOT substation, and supplying electrical power to the LRT system load at the DEPOT and the SAVE- ONE substation. Furthermore, the 22 kV feeder circuit (feeder 5) from Nakhon Ratchasima 2 substation, supplying electrical power to the LRT system load, was also simulated. For the 115 kV power distribution system, the results showed that the power supplied to the LRT system load at the DEPOT substation caused an increase of power loss and also resulted in a voltage drop to end-line users. However,

the voltage drop level was within the standard allowance, so it did not affect the load acceptance of power transformers. In the case of the power supplied to the LRT system load at the DEPOT and the SAVE-ONE substations, it was found that the power loss was less compared with the case of supply at the only DEPOT substation. Additionally, in the case of a 22 kV distribution system, the simulation results showed that while the power loss in the circuit increases, the voltage drop remains at standard allowance. The installation of a capacitor bank to the 115 kV system was simulated to mitigate the power loss in the 115 kV distribution system. The simulation results showed that the electrical power loss decreased by 5.78 %.



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