Application of Electric System Cascade Analysis for Various System Configuration

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Abstract

Ongoing primary reliance on conventional fossil fuel resources such as coal and natural gas (NG) for energy generation may be the most economical method but also the most damaging to the environment. Energy management of power plant via sizing is one of the energy and economical saving methods. In this paper, Electric System Cascade Analysis (ESCA), an analytical pinch method is used for optimally size the generation capacity of power plant and storage capacity of energy storage. Energy can be direct current or alternating current, which require rectifier or converter to convert the energy before transporting. Therefore, energy system configuration has various combination depending on the type of currents on each part of the system configuration. The usage of ESCA will be applied on 8 type of system configuration. A hypothetical case study is used to demonstrate the application of ESCA. Results show that the least energy lost due to energy conversion is the system configuration with the same type of current input and output.