

Multi-purpose ESS operation technologies for NTAs(Non-Transmission Alternatives)

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Abstract

NTAs(Non-Transmission Alternatives) technology involves the utilization of new power equipment such as ESS, HVDC, FACTS, or the adoption of policies like power generation constraints and DR(demand response) to defer the construction of new transmission lines.

Currently, KEPCO(Korea Electric Power Corporation) faces significant challenges due to the regional concentration of renewable energy sources and the intensification of power demand in the metropolitan area. However, due to the problem of public acceptance, large-scale construction of new transmission lines is very difficult. Therefore, the urgency and importance of these technologies are increasing.

In this presentation, we developed a technology to derive the optimal SOC of ESS, considering contingency scenarios based on real-time power system data. Additionally, we explore multi-purpose ESS operation techniques utilizing large-scale ESS to improve frequency stability during grid faults and alleviate intermittent line overloads or control line utilization rates during normal conditions, serving as NTAs.

By dynamically adjusting the SOC of ESS in real-time, we enhance operational flexibility of ESS. Additionally, we develop multi-purpose ESS operation techniques, utilizing large-scale ESS to improve frequency stability during power system accident and mitigate intermittent line overloads or control line utilization rates during normal conditions. The developed techniques will be applied to a 50MW-rated ESS at the Geumak CS on Jeju Island for a one-year field test. Furthermore, We also plan to review the feasibility of using ESS installed in KEPCO's onshore grid for NTAs.