Operation of ESS Interconnected to the Distribution Feeder by Distribution Management System

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Abstract

This paper introduces the results of ESS application in the rural distribution feeder operated by DMS (Distribution Management System) which is developed by KEPCO.

In normal condition, the objective of ESS operation is to minimize power purchasing cost by reducing system peak and considering market price. For operation of ESS, the following step is done. There are three type of data, feeder load from CB(Circuit Breaker), load forecasting for next 24 hours and electric market price from ISO. Using the above those data, ESS scheduler application of DMS provides the operation schedule. After that, DMS will make the control command for dispatch of the ESS charging and discharging schedule. Fig. 1 shows the charging and discharging schedule of the ESS on HMI, the ESS scheduler provides the charging schedule during 4 hours when market price is low. After that, the ESS scheduler makes other command for discharging schedule during 1hour at price peak time to minimize the power purchasing cost.

In abnormal condition, there is a fault in transmission network, ESS can be used to alternative resource for fault restoration. When fault occurred, fault diagnosis application of DMS runs to identify fault section and index on it. Next, restoration application provides sequential switch on and off control and ESS operation for restoration of outage area. Fig.2 shows the switch operation process for restoration by ESS when fault is occurred on upstream transmission line. Finally, this paper introduces the results of intentional islanding operation with ESS.

Fig. 1 ESS Dispatch Schedule

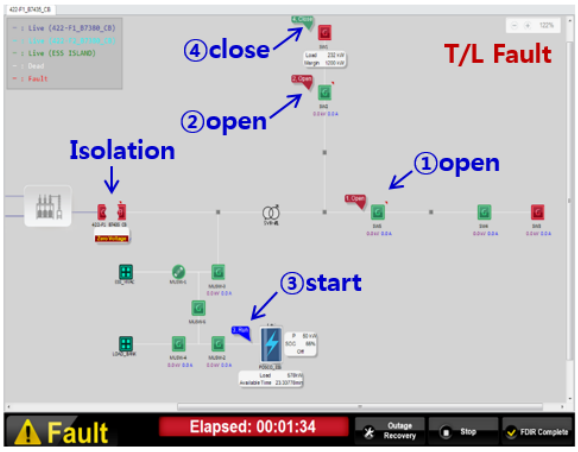

Fig.2 Fault Restoration Solution with ESS