Project Title: Exploring Cyber Security Issue and Solution for Energy Storage at Smart Microgrid System.

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1. Project Overview

A smart grid aims to improve the efficiency, reliability, economics, and sustainability of the production and distribution of electrical power. Two-way digital communication and computer- based remote control and automation are the keys to a smart grid system. Microgrids are localized grids that can strengthen grid resilience and help mitigate grid disturbances while supporting a flexible and efficient electric grid via integration of renewable energy sources, energy storage, and demand response. Without the energy storage system, smoothed power cannot be delivered to customers. The charge and discharge of an energy storage system can be regulated through an internet based supervisory control system. Thus there is a high possibility of cyber-attacks, which may significantly affect the functionality of the energy storage system. If the energy storage does not function properly, then the distributed generators will provide fluctuated power, voltage and frequency to the customers, i.e., the power quality of the smart grid system will be deteriorated. The goal of this project is to investigate and test cyber security for the energy storage system with a view to building a resilient and reliable smart microgrid.