

Supervisory Control And Data Acquisition (SCADA) System via Satellite Link Technology for Remote and Isolated Photovoltaic – Diesel Hybrid Power System in Indonesia

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Abstract

Recently, the Indonesian Agency for the Assessment and Application of Technology (BPPT), has successfully installed 14 units of Photovoltaic – Diesel Hybrid Power plants located in 6 and 8 remote locations in Central Celebes Province, and South Eastern Celebes Province respectively. Each hybrid system consists of an 8 kWp Solar Photovoltaic System, a 650 Ah Battery bank, and a 25 kVA diesel generator set. The system is intended to supply about 200 to 225 households with average of 200 VA each house.

The hybrid system is designed for an automatic operation, yet a continue data monitoring is required to ensure a proper and successful operation. The data of diesel operation hour, inverter operation status, and energy produced by solar photovoltaic, battery status, and delivered to consumer are to be obtained for further assessment of optimizing the system operation. Other measurement of electric parameter such as system voltage, current, frequency and fault status are also required to maintain the system quality and reliability.

However due to the remoteness of location, it would not be practicable to obtain such data continuously. Therefore in this concern a remote data communication technique has to be considered to overcome the distance. This paper discusses the utilization of satellite data communication link to achieve the remote data communication objective. This paper also describes the measurement of essential system parameter, as well as the remote data communication configuration and interfacing equipment. The remote communication involves the SCADA (Supervisory Control and Data Acquisition) operation via a service of a commercial satellite communication provider, which provides daily data of hybrid system performance. The data is collected at local data logger, and remotely downloaded from Jakarta.

As a final remarks, in this paper revealed that the application of remote SCADA for remote photovoltaic – diesel hybrid system provide a major benefit in a continuous monitoring system, responsive system troubleshooting and more importantly cost effective operation and supervisory system.