Design and Analysis of Diesel Generator with Battery Storage for Microgrid System

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ABSTRACT
Nowadays, distributed generation innovation required picked up a greater amount by many countries. Recently, there would a many issue for power system. A standout amongst those issue is high electricity price. Those cost previously, energy generation depend generally on the sort also market value of the fuel used, government subsidies, government and industry regulation, furthermore actually local climate patterns. Other than that, utilization of fossil fuel necessary on a chance to be cuts. By utilizing those fossil fuel, it will result in the exhaust cloud and corrosive downpour. Subsequently that, it will result in the greenhouse emanation and earth's environmental will shift. So as with supply a better power system, this report introduces an model about Diesel Generator (DG) and a battery storage microgrid (MG) system. The DG may be the little scale which broadly utilized within power generation system. DG can work for renewable also non-renewable energy. Through this project, DG will be design toward utilizing DG and battery storage system. Those DG system will make Analysis for grid connected.

Keywords: Battery Storage, Diesel Generator and Microgrid

I. INTRODUCTION
The electrical energy industry now is going for giving power electrical to everybody. The must to produce and distributed this electrical power as inexpensively as possible has resulted in de-regulation of the electricity industry. All the more significantly, the worldwide "Green-activity" goes for changing the common energy sources to renewable. Furthermore, the renewable technologies are very difficult to accessibility the resources like hydro generation and changeable weather condition like wind generation, solar photovoltaic.

With a specific aim to increase accuracy and minimize these impacts, diesel generator are being modeling and implemented. These coordinate operation of different type of renewable and less carbon sources. Energy storage devices are incorporated for cost effective electrification. This then justifies the lifecycle cost of renewable technologies.

This researches project investigates the performance Diesel Generator with microgrid system. The system will be tried for both diesel generator to microgrid system and battery storage microgrid system. This report will include modeling, simulated and investigation of diesel generator with micogrid system and battery storage with microgrid system.

II. MICROGRID SYSTEM MODELING
A. Diesel Generator Model
A diesel generator is the blend of a diesel motor with an electric generator (regularly an alternator) to produce electrical energy. This is a particular instance of motor generator. A diesel pressure start motor frequently is intended to keep running on fuel oil, yet a few sorts are adjusted for other liquid fuels or natural gas. Diesel generating sets are utilized as a part of spots without connection with a power grid, or as emergency power-supply if the grid fails, and also for more complex applications, for example, peak-lopping, grid support and fare to the power grid. Measuring of diesel generators is basic to stay away from low-stack or a deficiency of force and is muddled by advanced hardware, particularly unbalanced loads. In size ranges around 50 MW or more, an open cycle gas turbine is more productive at full load than a variety of diesel motors, and much more conservative, with similar capital expenses; yet for general part-loading, even at these power levels, diesel clusters are once in a while liked to open cycle gas turbines, because of their unrivaled efficiencies.

B. Battery Model

Batteries can be worked in grouped utility applications which in the area of generation and residential. Batteries as of late have the biggest scope of utilization separate to other energy storage technologies. Battery system gives the most benefit for utilities when giving power management support and the reaction for immediate voltage spike or sags and shock.

Battery system comprises of cells which have a qualities working voltage and most extreme current potential. Dominant part of battery energy storages system have control power system that handle electricity from the battery and makes it suitable for AC loads. This including changing the current and voltages to maximize the power output, coordinating the changed over AC power to AC electrical system and goes to the end current flow out of the system into grid during outages. The change from DC to AC power in power conditioning system is finished by an inverter [14].

III. RESULT AND DISCUSSION

From Figure 4.3, the voltage is 200 V. From Figure 4.4, the current is 100 A. From Figure 4.5, the active power is 29 kW and the reactive power is 5 kVAr.
From Figure 4.12, the voltage is 600 V. From Figure 4.13, the current is 400 A.
IV. CONCLUSION

In conclusion, the objective (i) the concept of diesel generator connect to microgrid required studied. There have pro and contras for the implementation for diesel generator to microgrid. The objectives (ii) might have been achieve the diesel generator system to microgrid had been designed by utilizing MATLAB Simulink software. The objective (iii) also achieve by the battery storage system to microgrid had been designed by utilizing MATLAB Simulink software. The outcome or result and simulation had been made in chapter 4.

REFERENCES


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