NEWS INDEX

MHIET Develops “Triple Hybrid” Stand-alone Power Supply System with Renewable Energy -- Optimal Stability Control Achieved through Combination with Engine Generator and Storage Battery --

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Tokyo, June 24, 2019 – Mitsubishi Heavy Industries Engine & Turbocharger, Ltd. (MHIET), a Group company of Mitsubishi Heavy Industries, Ltd. (MHI), has developed a “Triple Hybrid” stand-alone power supply system that combines renewable energy such as solar power with a reciprocating engine generator and storage battery, allowing for optimal stabilization control. The system's main advantage is its ability to stabilize the volatile output of renewable energy by combining three types of power sources, allowing for a high efficiency, low-cost power supply provided by an environmentally-friendly, multi-purpose distributed generation system. The Triple Hybrid Power Station demonstration facility, combining solar power generation equipment, storage batteries, and an engine generating plant, has been put into operation at MHIET's Plant, where the head office is located. The power generating system has been named EBLOX, and the control system COORDY. These systems establish a structure that allows MHIET to offer solutions to meet diverse power supply needs.

Power derived from natural energy is highly susceptible to fluctuations in weather or other factors (variable renewable energy), so the higher the proportion of such energy, the greater the volatility in the power supply. The triple hybrid stand-alone power supply system was developed by making efficient use of MHIET's core technology to manage this shortcoming. The fluctuating power from variable renewable energy is absorbed in the storage battery to level the supply, with backup from diesel or gas engines to generate power unaffected by changes in the weather or the time of day.

The energy control system for the power supply system manages the diverse power sources to optimize operation of the components, lowering the operational cost. In addition, the storage battery inverter provides stabilizing capability to cope with load imbalances or sudden changes occurring during parallel operation of the power source mix. Further in case of parallel operation with the grid, utilizing the storage battery's quick discharge and charge function allows the double hybrid system of engine and battery to provide shorter power feed times and the frequency containment reserve capabilities that will be needed for the balancing market in Japan going forward.

The Triple Hybrid Power Station comprises a 300kW-class solar power generating facility, a 500kW/0.5hr storage battery, a 500kW gas engine generator, auxiliary equipment, and the control system. All the power generated is used within the factory. To provide for various off-grid operations testing, the station is also equipped with a variable load resistor that allows separation from the power system line.

The product name “EBLOX” reflects the combining of multiple types of energy (E) together like blocks, with “BLOX” also incorporating the sense of building the social infrastructure. The control system “COORDY” expresses the idea of an energy coordinator.

Many areas around the world cannot be reached by the transmission and distribution networks of power companies, and need simple, stand-alone power generating systems. At the same time, stand-alone distributed power supplies are increasingly being looked to as a means to cope with natural disasters such as earthquakes and flooding. MHIET, by offering a hybrid power generating system (EBLOX and COORDY) with the capacity to stabilize volatile renewable energy and meet these needs, will expand the potential to enhance the added value of renewable energy, and contribute to the realization of a low-carbon society.

“Triple Hybrid” stand-alone power supply system: EBLOX

The Triple Hybrid Power Station demonstration facility

Bird's-eye view of the demonstration facility

“Triple Hybrid” Stand-alone Power Supply System-EBLOX
https://youtu.be/igjC9RmVRJU