Conclusion

The current community and environment are inextricably connected to its other half; energy. As a result, the importance of the backup power has recently become a high profile. Hence, in this report the backup power synchronous diesel generator discussed and depicted in details. This project is aimed to simulate and design a three synchronous backup power diesel generator that is connected to critical load such as; hospitals, plants, banks, etc. The project is composed of many parts to deliver the required power to the load. Each one of the diesel generators that has been used has a capacity of 600kw and the connected load’s capacity of 500kw. Also, there are three cooling units that connected to each diesel generator in order to maintain the temperature at a fixed range. In addition, there is an automatic transfer switch (ATS) that’s function is to switch the power source from the main grid power station to the backup power when occurring any outage to sustain the delivered power to the load. Furthermore, the safety measurements have been taken into account so the circuit breakers have been used to prevent any system failure. The synchronization process is considered in this research project in order to maintain the three back up diesel generator at the same phase and frequency so the load gain is at the same level. Furthermore, the mechanical parts; the governor and the exciter that used were essential since the exciter is mainly used to provide the main power to the electromagnetic that form the poles of the rotor and the governor’s function is to maintain the rotary speed of the motor within reasonably close limits. Also, the wifi feedback system has been used to receive and transmit the signal to monitor the working of the load and the backup power system. The monitoring system has been used and connected to the backup power generators to provide us with the updated results to sustain the electrical power. The diesel is used as a fuel power source to the generators since it’s burned at a high temperature so it provides the generators with more power and it’s more efficient compared to the other sources. In summary, this project has proven that it’s crucial not only luxury to use a backup power system to any critical load especially in these conditions since it doesn’t only cost money, but it highly costs more than that it costs people’s lives.