CHAPTER 6
CONCLUSIONS AND SCOPE FOR FURTHER STUDY

6.1. CONCLUSIONS

Distribution restoration plays a critical role in the future “Smart Grid” to enable the power network at the distribution level a self-healing capability. Such a distribution restoration procedure refers to the process of changing open/closed states of tie switches and sectionalizing switches to restore loads that are disconnected from the grid due to fault isolation actions. The loads in the out-of-service area should be restored as quickly as possible after the fault is isolated. A restoration plan with minimized switching operations and an optimized switching sequence will reduce the impact of outages and enhance system reliability. The distribution system restoration problem is a multi-objective, non-linear, combinatorial optimization problem with numerous constraints, including topology constraints, electrical and operating constraints. A large number of components in the distribution system and complicated generation and load models add to the complexity of a difficult problem.

Dynamic switching of power flow is vital and can be achieved by adapting various technologies; currently the methodology to implement the self-healing system is achieved by Internet of Things (IoT), has exponentially increased the scale and the complexity of existing computing and communications systems: the autonomy is thus an imperative property for IoT systems. Self-healing is one of the most important components of autonomic computing. It has the ability to modify its own behaviour in response to changes in the environment (in real-time) by repairing the detected faults. Therefore, self-healing ability of the system is very crucial for

i. the protection of the power grid

ii. its optimization based on market strategies or economic and environmental policies.
6.2. Scope for Further Study

Development of a self-healing power network that is able to anticipate and response to disturbances has been envisioned in to enhance system reliability and customer satisfaction in the future power grid.

This study paves the way for further development of new tools and techniques in this area which should enable large national infrastructures to self-heal in response to threats, material failures, and other destabilizers. With the global focus on energy management and conservation, low power controllers – Internet of Things(IoT) will extend the connected benefits of the smart grid beyond the distribution, automation and monitoring being done by utility providers. Management systems for in-home and in-building use will help consumers monitor their own usage and adjust behaviours – Demand Side Management (DSM). These systems will eventually regulate automatically by operating during off-peak energy hours and connect the sensors to monitor occupancy, lighting conditions, and more. But it all starts with a smarter and more connected grid.