CHAPTER FIVE

CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

The studies conducted in this research yield some conclusions. The National Grid of Sudan has weaknesses areas and need effective solutions. The conventional techniques for system reinforcement had economical shortcoming and issues of land properties license. Substation expansion or building new substation are costly and need more space and time.

The introduction of FACT devices was revaluation in transmission line enhancement. STATCOM and TCSC are used for transmission line assessment. They can be used for voltage control, stability improvement and oscillations damping. They need less space and has small cost compared to conventional methods.

The control adopted with The STATCOM is chosen to regulate the bus voltages beside dc link voltage. The installation location is chosen based on load flow analysis. Marenjan substation voltage was 0.73pu and need to be recovered to 1.0pu.

The result of using STATCOM in Marenjan substation can be taken as example for the other weak substations such as Giad and Kilo X.

The implementation of the STATCOM model into NG bus-bar, and the results presented and discussed for a simple test system show how this model can be readily and reliably used for stability studies of power systems.

5.2 Recommendations

In order to maintain the National Grid of Sudan secure and reliable the following recommendations:

1. FACTs controllers are suggested specially the SATACOM controller.
2. To study the National Grid of Sudan Neplan and MATLAB software is suitable.
3. The NG must have more generation than the existed to meet the rapidly increase in load due to the revolution in industry and agricultural.
4. Before adding new power plants, the NG of Sudan must increase the capacity of transformers and lines which their probability of overloading is high.
5. For constructing new power plants, suitable locations must be regard.
6. Available power plants with low installed capacities must be renewed. Especially that energy consumption and load growth rate is increasing rapidly because of foreign investments in Sudan and the rapid development of the country.

After implement the recommended, system improvements will ensure and improvements will made on system reliability and supply continuity.