CHAPTER – 6

CONCLUSION

The present work has proposed a new DFL excitation control strategy. The effectiveness of the proposed controller for power system transient stability enhancement has been illustrated by simulation results. The proposed control law can be realized with the help of quantities physically measurable at the generator terminals. Therefore, the proposed controller is suitable for decentralized control. The simulation results amply demonstrate that the new controller is quite insensitive to the changes in fault locations, fault clearing time, network configurations and operating points, and exhibits excellent robustness to such external disturbances. However, some areas still remain for further studies. The proposed DFL control input to the excitation system does not include any voltage feedback and voltage reference. This may cause unacceptable voltage magnitudes at the post-fault steady state. Researchers [39 – 45] have reported several methodologies to overcome this problem. In connection with the present work, further studies are required to develop a methodology to encounter this problem. Further point of concern is this, the post-fault equilibrium values of power angles have been assumed to be known in this work. However, in real power system, the situation is different. Application of the observation decoupled state space [62] is a viable way to overcome this difficulty. For the new controller, simulations are required to verify its performance with the observation-decoupled states. However, from the extent of the present work, it can be concluded that the results of the primary investigations on the newly proposed DFL excitation controller is quite encouraging. It can be a potential candidate for employment as robust decentralized excitation controller for power system transient stability enhancement. From the point of view of practical implementation, the proposed controller offers much simpler and easier option compared to other existing robust nonlinear decentralized excitation control methods.

Then co-ordinated control of the proposed excitation controller and UPFC has been found to be very effective. Simulation results have shown that the co-ordinated control enhances the transient stability further. In this work, PWM controlled UPFC has been considered and simple control strategy for UPFC has been studied. The watt-var decoupled d-q control strategy [28,29] can be a better option which has not been tested in the present study. It can be a subject of future research if better control strategies for PWM controller can be deviced for transient stability improvement.