CHAPTER FIVE
Conclusion

In this thesis the transient performance of synchronous generator boosted by a bank of capacitor and connected to infinite busbar through feeder and transformer has been discussed. This system is modeled by a set of first order, nonlinear, ordinary differential equations using unified theory of machine. The differential equations describe the machine and system behaviors as a function of time.

The study compares the transient performance of this system in different levels of boosting. Aided excitation requirements for different load conditions and different levels of boosting have been first computed, using a steady-state model. With the aid of optimization algorithm method, model of this system has then been used to optimize the machine parameters.

The comparison of the transient performance shows that the higher boosting level has several advantages over the lower boosting level. It reduces the first rotor swing and gives more damping to the rotor oscillations. It also suppresses all power frequency torque oscillations. Generally we can say higher boosting level improves the behavior of synchronous generator during disturbance.

Future work is suggested in the direction of the dynamic performance of wind turbine driven synchronous generator boosted by a bank of capacitor. These elements are connected to an electric network of large capacity.

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Appendix A

Optimum values of the machine parameters in p.u.:

R_a	0.0685
R_F	0.068146
L_d	1.824
L_q	0.365
L_F	1.6580
M_{dF}	1.5920
L_D	1.82
L_Q	0.365
M_{dD}	1.765
M_{qQ}	0.3104
M_{FD}	1.5920
R_D	0.0365
R_Q	0.02

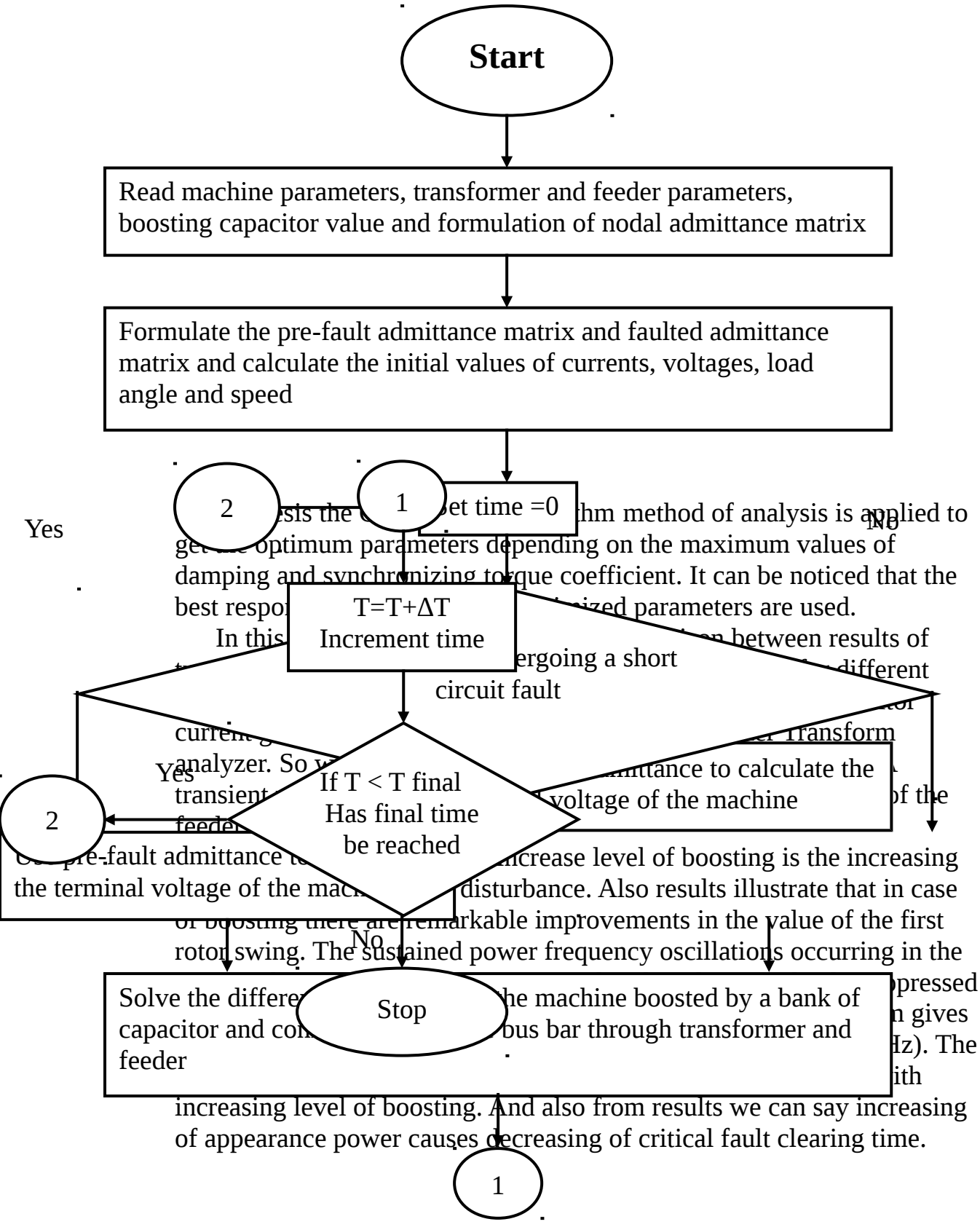
Table (1)

Constant of inertia H = 2.418 sec

Frequency = 50 Hz

Appendix B

The transient stability program of synchronous machine boosted by a bank of capacitor and connected to infinite bus bar is outline in the following flow chart.



...sis the ...hm method of analysis is applied to get the optimum parameters depending on the maximum values of damping and synchronizing torque coefficient. It can be noticed that the best respo... ...ized parameters are used.

In this ... ...on between results of ... ...ergoing a short ... ... different ... ... current ... ... analyzer. So ... ... transient ... ...of the feeder ... ... pre-fault admittance ... ... increase level of boosting is the increasing the terminal voltage of the mach... ... disturbance. Also results illustrate that in case of boosting there are remarkable improvements in the value of the first rotor swing. The sustained power frequency oscillations occurring in the ...pressed ... Solve the differe... ...he machine boosted by a bank of capacitor and co... ...bus bar through transformer and feeder ...n gives ...Hz). The ...ith increasing level of boosting. And also from results we can say increasing of appearance power causes decreasing of critical fault clearing time.

Finally we can say existing of boosting improve the behavior of synchronous during disturbance.