CONCLUSIONS

A detailed literature survey relevant to the proposed research work related to controller design for SBSRM has been presented in this thesis. The selection of poles and pole arc for 12/14 is explained in detail. The FEM analysis has been done on stator of 12/14 SBSRM and compared with that of 8/10 SBSRM. Using the FEM analysis, Inductance characteristics for both levitation and torque winding of the 12/14 SBSRM carried out and compared with that of the 8/10 SBSRM.

In this thesis, the author proposed a new and simple levitation algorithm for the selection of poles to excite the torque and levitation poles of hybrid pole type 12/14 SBSRM which converts four input displacements into two displacements. This new algorithm needs only two displacement sensors reducing the overall cost and also the control algorithm has become easier.

A new method for the design of controller for speed as well as for position controlling of the Hybrid Pole type 12/14 Self Bearing SRM is presented in this thesis. A robust fuzzy PID controller in a parallel structure has been developed in real-time is to Hybrid Pole type 12/14 Self Bearing Switched Reluctance Motor and described in detail.

The proposed new algorithm for controller which is integrated fuzzy with conventional PID controller is verified in practice, experimentally for speed as well as for x & y directional rotor eccentric displacements controlling of the Hybrid Pole type 12/14 Self Bearing SRM. The results show an excellent unique tracking performance with proposed fuzzy integrating PID controller and established the usefulness of this controller in motor drive with uncertainties of rotor displacement parameters in both X-direction and Y-directions.

The results obtained using the proposed controller has been compared with those obtained by the conventional PID controller to show the effectiveness and advantages of the new controller scheme proposed in this thesis. The practical implementation has been based on RTIO (Real Time input output) and MATLAB/Simulink environment

The proposed PFPID controller has been successfully implemented to over come the significant drawbacks of existing controlling methods like , complex levitation algorithms for the selection of poles as the number of poles are increased, instability of rotor, drawing more currents at the time of starting, complexity involved in tuning methods and high cost of displacement sensors because of complexity in controlling algorithm.

Scope for future work:

The present work can be extended for the following aspects in future research work.

(i) For the implementation of sensor less controller for both speed and suspension.

(ii) For the implementation of non-linear state feed-back controller for 12/14 SBSRM.

(iii) For the implementation of speed regulation technique for 12/14 SBSRM.