CHAPTER 6

CONCLUSION AND SCOPE FOR FURTHER STUDY

6.1 Conclusion

The detailed study was made on Nine level MLI fed induction motor drive with front end rectifier. The performance was analysed using PSIM simulation software. Various results were obtained in which, the value of THD and PF are 85% and 0.73 (lagging) respectively. The values fail to come into IEEE standards.

The PF of the three-phase ac input line current war improved by using HF current injection by passive network. The main advantage of this approach is that, it does not require any additional active component for HF current injection. Due to the current injection at a high frequency, inductors L and capacitor C_f values were decreased and various results were obtained. The obtained value of THD and PF is 7.8% and 0.99 (lagging) respectively, which are undesirable. To reduce the THD value further, passive network was replaced by active network.

Supply current Percentage THD and input power factor were analysed in the active current injection technique. In the proposed technique the current harmonics has been drastically reduced to 5.8% and also the converter offered many advantages such as unity power factor operation, high THD, low EMI and low switch stresses. The soft switching of the devices decreased the switching losses thereby increasing the efficiency. The power factor of uncompensated system was 0.73 and is improved to 0.99 in active current injection network.

On comparing the THD Analysis, active current technique is very effective in mitigating harmonics thereby enhancing the power factor and dynamic response when compared to passive current injection technique. The key features of this topology is low cost, small size, high efficiency, simplicity, and excellent retrofitting front end rectifier of existing ac drives, UPS etc.

6.2 Scope for Further Study

According to this research work, the harmonic content present in the end product of the converter is less in active current injection technique than passive current injection technique. In future, the Hybrid current injection technique can be verified to minimise the harmonic content instead of using either active or passive current injection technique. Based on intelligent controllers technique, this research work will be extentended in the measeurement of harmonics in converters.

In this technique, the square wave current injection can be used instead of sinusoidel currend injection. Similarly cascade H-bridge MLI can be used insted of diode clamped inverter. Instead PSIM simulation tool, MATLAB simulation software could be applied. With these variation of all elements, the harmonic measurement will be changed and a research work can be done in future.

By incorporation of one or more of the above mentioned refinements to the proposed multilevel inverter control technique, better optimization of functioning could be attained.