

## **CHAPTER 6**

### **CONCLUSION AND RECOMMENDATIONS**

#### **6.1 Conclusion**

The research procedure for developing an expert system for AC. induction motor vibration diagnosis, ESAVD, are as follows.

6.1.1 Select appropriate problem for developing expert system. The problem should be able to be modeled as rule based or reasoning based system.

6.1.2 Knowledge Acquisition is time consuming process. Especially if the interviewing is done without the cooperation from the field work. The developer of expert system has to collect as much knowledge as possible to increase the reliability and effectiveness of the system.

6.1.3 Using Level5 Object for developing an expert system is appropriate due to many advantage points. The Level5 Object itself support the reasoning system. Moreover, oriented object is supported in the Level5 Object. The developer of expert system can design the search logic of the system either

backward chaining, forward chaining, or the combination of both. However, for many factories in Thailand, the Level5 object is not widely used. Therefore, the user have to install the Level5 Object program before using the ESIMVD.

6.1.4 Some of the collected data have to be separated for validation. The current data is also used for validation.

6.1.5 The strong point of the ESMVD is it can be easily further developed in particular manufacturing plant. As the result, cost in maintenance tools, maintenance software and database will be obviously decreased. Cost of hiring or consulting human expert will also be reduced. The dependence of both human expert and imported analytical software will be decreased.

6.1.6 The weak point of the expert system is the Level5 Object format, though the Level5 Object is very suitable in developing an expert system. Because the Level5 Object is special development tools, its price is very high. The result is popularity of the tools will be limited in only expert system field. General manufacturing plants would not have such a tools in their plants. Therefore, implementation of the expert system require manufacturing plants to purchase and install the Level5 Object first. However, investment in the Level5 Object is worth enough when compare with the high price analytical software, which can not be further develop by end user.

## **6.2 Recommendations**

6.2.1 Continuous improvement should be further taken since the knowledge in vibration analysis is growing. In practical, particular symptom of machine may be newly found every week. The end user should be add the new discovered knowledge to make the system more reliable.

6.2.2 In implementation in manufacturing plant. The expert system is capable in interface with machine data base. The data base will make the expert system more useful. Historical data and trend of overall data should be provided for more effective use of the program.

6.2.3 Further development should be done to make the expert system capable in analysis of machine train; the load side analysis of motor should be included in the program. In doing so, the weak point of the expert system will be eliminated. Furthermore, the signal data from the vibration tools or equipment can be interface if the format of data in such tools or equipment is known.