CHAPTER 6
CONCLUSION AND RECOMMENDATIONS

6.1 Conclusion

In the research on development of an expert system for power transformers fault diagnosis, the research procedures are :

6.1.1 Knowledge acquisition from experts which is time consuming step by interviewing them on the knowledge, experiences, skills, and steps of solving problems using prepared systematic question which can reduce the time and procedures. The experts should give their cooperation and recommendation to knowledge engineer also.

6.1.2 The analysis and design of knowledge base from gathering knowledge, the knowledge was translated by representing into flowcharts for easy to check and test the fundamental system. Then the input, output and process will be designed in the Object-Oriented form which can reduce resource usage and improve processing efficiency.

6.1.3 The rule and knowledge base construction were related in computer programming aspects using Microsoft Visual Basic and Microsoft Access.

6.1.4 In user interface part, the fundamental results of the rules and the knowledge base in expert system were designed for easy to use and developed for using under the Microsoft Windows operating system.

6.1.5 On the testing procedures, the expert system was tested and corrected by using simulating events until the weakness and errors of the developed expert system were eliminated completely.

Developed expert system can work properly in providing description and recommendation to related personnel from power transformer fault diagnosis

procedures which can substitute human expert determination in general causes of faults for system restoration of power transformers and reduce unnecessary testing and determination time on causes of fault analysis, especially for nuisance trip or malfunction of protective equipment.

6.2 Recommendations

6.2.1 The expert system should be developed in object-oriented parts by minimising the number of classes and objects in order to make the processing faster.

6.2.2 The uses of expert shell are needed to practice for optimum performances.

6.2.3 The system can be developed from off-line operation to real-time on-line operation by using real-time expert shell receiving signal from SCADA network EGAT and the others for simultaneous processing.

6.2.4 The system can be used in establishing, staffing, and training which is a set of guidelines and suggestions for the selection, education, and training of the knowledge engineer.

6.2.5 The knowledge base should be modified and updated continuously for covering and responding on most specific events which cannot be solved to find the causes of them from normal condition due to the fact that there are unlimited specific causes for unpredicted faults.

6.2.6 The knowledge modification and update parts of expert system should be improved for robust uses.

6.2.7 The assists from multimedia presentation pictures, sounds, animation, video clips and other medias should be implemented into expert system for most efficiency and completeness of GUI.

The implementation of knowledge can enable an ordinary personal computer to be the expert engine in giving information for repairing and maintenance completely under other supported technologies, it can establish knowledge and

understanding in expert system theory, including developing techniques which can be implemented as the concepts and prototypes for the more important and more complicated system. For example, expert system for decision support in power system can help the power system restored back to steady state after various problems have happened, or designing help desk for repairing various equipment, and etc.