CHAPTER V
CONCLUSION AND RECOMMENDATION

5.1 Conclusion

The downhole pressure or ECD calculation while circulating power law fluid has been studied with and without pipe rotation effect. Several published models from both empirical correlation and mechanistic models are used with practical field to accurately predict downhole pressure. A statistical analysis indicate that conventional model combined with increased-pressure-loss from rotation speed and diameter ratio gives precisely estimating pressure loss. The rotation effect becomes more dominant when annular space is narrower. An optimized model is used in a user-friendly software development. The software need the data input from LAS file and user, then it can display well trajectory, casing program and ECD window in depth log.

5.2 Recommendation

In annular pressure loss calculation, there will be subsurface temperature and drillpipe eccentricity which influence on pressure loss. There are several literatures that propose the predictive model considering eccentricity, but it is not applicable for practical use because drillpipe eccentricity in field operation is very difficult to identify. To identify pipe eccentricity, pipe buckling is significantly required and it needs stiff-string model to figure pipe geometry along wellbore. The effect of subsurface temperature on fluid property should also be captured in further study.

In field operation, all drilling parameters are measured by sensor. Each contractors has different sensor which locate at each different point. Thus some drilling parameter from each company might be different value including ECD. Consider ECD at field operation with different contractor, the offset ECD between two contractors are approximately 0.2-0.5 ppg. To improve model verification, measured ECD used in this work should vary in certain range to determine the effect of offset measured ECD on model validation.

According to drilling fluid report from operating company, fluid properties can be used only for power law model. Hence power law fluid was selected in this research. There will be another fluid rheology, yield power law fluid, which was more commonly used than power law fluid. By the way, to use yield power law fluid and their predictive model, it importantly requires more practical data to become more precisely describe fluid rheology, and then will achieve an accuracy of pressure loss estimation.

In software development, the data provided from service company is not perfectly real time concept due to a difference in data format and data connection between developed software and service's database. This software should connect data from database through well-site information transfer specification (WITS) in order to receive real time connection. However this software is validated for only onshore operation. It should be validated with offshore operations to be applied for all operations.