CHAPTER V
CONCLUSION AND RECOMMENDATION

5.1 Conclusion

This research developed a user-friendly T&D software of well planning via the GUI of MATLAB. This provides accurate T&D models because this research's calculations are based on 3D T&D calculations by Prurapark (2009). This software will support the evaluation of the consistency of the well design and T&D calculations in order to prevent the unexpected risks, especially alleviation of the sinusoidal and helical bucking problems where the helical buckling normally causes lock-up potential. WOB, DF, and HWDP have effects on axial tensile force and torque at the surface. The increase in WOB increases the axial force and torque at the surface as the same as the direction of the HWDPs placed in particular area of the well. While the axial tension force was increased due to the increase of DF, the torque at the surface was decreased. These effects will also help avoid those risks. The software was verified using the field data in Thailand with the reasonably accurate results.

5.2 Reccomendation

This research, the T&D equations based on soft-string model solved by using the numerical Euler method. Further development should use stiff-string model to analyze T&D which account for blending stiffness of the drillstring and radial clearance between the drillstring and wellbore. According to the complexity of the model, the finite elemental analysis should be use to solve T&D equations instead of Euler method.

The coefficient of friction is involved in T&D analysis because this is the main drag factor affected by the contact surface, type of formation, hole cleaning, drilling fluid properties, etc. This should be estimated from a real time drilling parameter and modified in the model for more accurate result. Consequently, the

actual coefficient of friction in different section along the well trajectory could be applied to the software instead of the single value for more accurate results.

Furthermore, the hydrodynamic viscous force depending on drilling fluid should be considered during different operations in the software and should be used to find the effective tension of the drillstring in different drilling fluid properties in the next development. Moreover, the downhole weight on bit and bit torque estimation using T&D calculations should be included for more precise actual field data.

However, this software can runs some operation modes; RoffB, RonB, POOH, and RIH. The developed T&D equations should be applied for all operations, such as sliding drilling and combined motions (reaming and back reaming operations where the pipe is rotated and pulled or lowered at the same time).