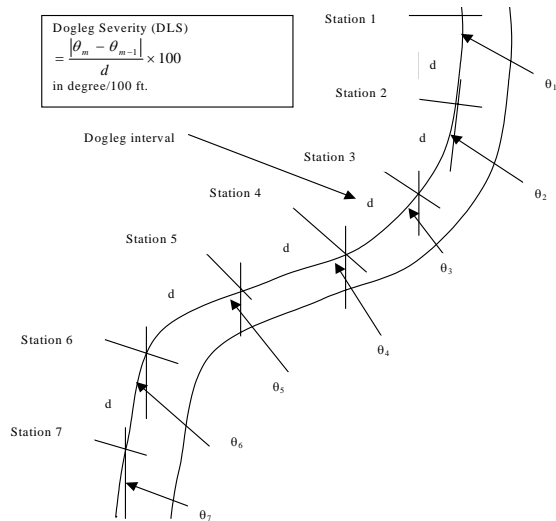
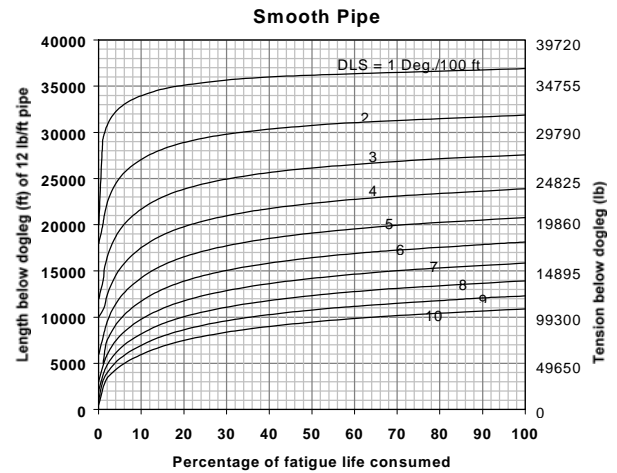


## Fatigue tolerant drillstring design

The possibility of drillstring fatigue failure is a great concern in the rotary drilling mode. It is important to be able to determine the conditions at which torsional, tensile and buckling loads become critical and prevent these failures by assessing the structural requirements of the drillstring. This is especially critical for drilling slim, deviated and lateral wells. This project has developed analytical and numerical computational capabilities to model not only failure conditions including drill pipe fatigue life, but also to optimise operational conditions and material properties to avoid potential failures during drilling.



Drillpipes' dogleg modelling



Fatigue damage of drillpipes as a function of dogleg severity.

### Selected Publications:

- Rahman, M. K., Hossain, M.M. and Rahman, S.S., 'Survival Assessment of Die-marked Drillpipes: Integrated Static and Fatigue Analysis', *Engineering Failure Analysis*, Vol. 6, No. 5, pp.277-299, 1999.
- Rahman, M.K., Hossain, M.M. and Rahman, S.S., 'Stress Concentration Incorporated Fatigue Analysis of Die-marked Drillpipes', *International Journal of Fatigue*, Vol. 21, No. 8, pp.799-811, 1999.
- Hossain, M. M., Rahman, M. K., Rahman, S.S., Akgun, F. and Kinzel, H., 'Fatigue Life Evaluation: A Key to Avoid Drillpipe Failure due to Die-marks', paper SPE 47789, *Proc. of the IADC/SPE Asia Pacific Drilling Technology Conference*, Jakarta, Indonesia, Sep.7-9, pp.125-136, 1998.