Load case - static overpull

Oliasoft

Abstract In this document we describe the load case *Static overpull* available in the Oliasoft WellDesign™.

Introduction

Static overpull is an installation load case, and the unknowns are the axial load with and without bending from dogleg. This load case calculates the axial load from running of the tubing together with a static overpull force to a user defined depth.

Inputs The following inputs define the static overpull [installation] load case

1) A complete description of the wellbore, including measured depths, true vertical depths, and dogleg severities.
2) A complete description of the tubing dimensions, including density and weight, inner- and outer-diameters, internal- and external- crossovers.
3) The mud weight/density, ρ_{mud}.
4) The overpull force, F_{overpull}, and the overpull depth, MD_{overpull}.

Calculations First the axial load from running of the tubing is calculated, A_0:

1) Calculate the underhanging weight along the tubing, W.
2) Calculate the hydrostatic pressure in the wellbore from mud.
3) Calculate piston forces on the tubing, F_{p}, i.e. piston forces at the base of the tubing, and at any crossovers.
4) A_0 is then calculated by adding the buoyancy and the weight, i.e. $A_0 = W + F_p$.
5) The static overpull axial load without bending, A_{nb}, is calculated by adding the overpull force above the overpull depth, and keeping A_0 below, i.e.

$$A_{nb} = \begin{cases} A_0 + F_{\text{overpull}}, & md \leq MD_{\text{overpull}}, \\ A_0, & else. \end{cases} \tag{1}$$

6) Bending from dogleg and buckling (usually 0), b, is added, to get axial load with bending, $A_{wb} = A_{nb} + b$.