Load case - Dynamic Overpull

Oliasoft

Abstract

In this document we describe the load case *Dynamic Overpull* available in the Oliasoft WellDesign™.

Introduction

Overpull is an installation load case, on the same line as *Run in hole*, and the unknowns are the axial load with and without bending from dogleg, when running the tubing with an applied axial load at the surface. This load case is used to decide if the tubing can withstand an overpull force, with the tubing shoe at every depth, if the tubing gets stuck during the running operation. Contrary to the usual axial loads calculations, which give the axial load on a tubing at a given pressure and temperature, this load case calculates the maximum load a given point on the tubing experience while running the tubing in the hole, with and without bending. Effects included are the weight of the tubing, buoyancy forces from piston effects, bending forces from dogleg, and finally, the overpull force applied at surface.

Inputs The following inputs define the 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}.

Calculations The overpull axial load on the tubing is calculated as follows

1) Calculate the hydrostatic pressure in the wellbore from mud.
2) Calculate the bending force due to dogleg severity.
3) Calculate the axial load sequentially as the tubing is run in the hole, from weight and piston forces, and add the overpull force. For axial load with bending, add the bending force from dogleg severity as well. Then, at every measured depth, referenced to the tubing, report the maximum load experienced.