

Load case - casing evacuation

Oliasoft

Abstract

In this document we describe the load case *Casing evacuation* available in the Oliasoft™ application.

Introduction

Casing evacuation is a collapse load case, where the unknown is the internal pressure profile of the tubing¹. The scenario is that all or part of the mud being displaced out of the wellbore.

Inputs The following inputs define the casing evacuation load case

- 1) The true vertical depth (TVD) along the wellbore as a function of measured depth. Alternatively, the wellbore described by a set of survey stations, with complete information about measured depth, inclination, and azimuth.
- 2) The true vertical depth/TVD of
 - a) The rig RKB, TVD_{RKB} .
 - b) The hanger of the tubing, TVD_{hanger} .
 - c) The mud level, if any above the shoe, TVD_{mud}
 - d) The shoe of the tubing, TVD_{shoe} .
- 3) The fluid weight/density of mud, ρ_m .
- 4) Air density, ρ_{air} . Default value $\rho_{air} = 1.225 \text{ kg/m}^3$

Calculations The internal pressure profile, parametrized by TVD, of the tubing is then given by

$$p_i = \begin{cases} \rho_{air} g \text{TVD}, & \text{TVD} \leq \text{TVD}_{mud}, \\ \rho_{air} + \rho_m g (\text{TVD} - \text{TVD}_{mud}), & \text{else,} \end{cases} \quad (1)$$

where g is the gravitational constant, and

$$p_{air} = \rho_{air} g \text{TVD}_{mud}. \quad (2)$$

¹We denote any tubular by tubing. All calculations encompass both tubings and casings.