Load case - pressure test

Oliasoft

Abstract

In this document we describe the load case *Pressure test* available in the Oliasoft™ application.

Introduction

Pressure test is a burst load case, where the unknown is the internal pressure profile of the tubing[1]. The internal pressure profile is based on the hydrostatic pressure from mud, an applied test pressure at the wellhead, and the possibility to set a plug. If a plug is present, the test pressure is only seen above the plug.

Inputs The following inputs define the pressure test 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 and inclination.
2) The true vertical depth/TVD of
   a) The hanger of the tubing, $\text{TVD}_{\text{hanger}}$.
   b) The shoe of the tubing, TVD_{shoe}.
   c) The plug, TVD_{plug}, if present.
3) The temperature profile of the wellbore, T.
4) The mud weight/density, ρ_{mud}.
5) The test pressure, P_{test}.

Calculations

With plug The internal pressure profile is given by the hydrostatic pressure from mud plus test pressure from hanger to plug, and hydrostatic pressure from mud from plug to shoe, i.e.

$$P_i = \begin{cases} P_{\text{test}} + g\rho_{\text{mud}}\,\text{TVD}, & \text{TVD} \in [\text{TVD}_{\text{hanger}}, \text{TVD}_{\text{plug}}] \\ g\rho_{\text{mud}}\,\text{TVD}, & \text{TVD} \in [\text{TVD}_{\text{plug}}, \text{TVD}_{\text{shoe}}]. \end{cases} \tag{1}$$

Without plug The internal pressure profile is given by the hydrostatic pressure from mud plus test pressure from hanger to shoe, i.e.

$$P_i = P_{\text{test}} + g\rho_{\text{mud}}\,\text{TVD}, \qquad \text{TVD} \in [\text{TVD}_{\text{hanger}}, \text{TVD}_{\text{shoe}}]. \tag{2}$$

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