Load case - riser margin

Oliasoft

Abstract

In this document we describe the load case *Riser margin* available in the Oliasoft™ application.

Introduction

Riser margin is a collapse load case, where the unknown is the internal pressure profile of the tubing[1]. The pressure profile consists of the hydrostatic salt water pressure to the wellhead, and the hydrostatic pressure from mud below. This load case is similar to the external load case *Fluid gradient for open water*.

Inputs The following inputs define the riser margin 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 wellhead/BOP interface, $\text{TVD}_{\text{WH/BOP}}$
   c) The hanger of the tubing, $\text{TVD}_{\text{hanger}}$.
   d) The shoe of the tubing, TVD_{shoe}.
3) The mud weight/density, ρ_m.
4) The salt water density, ρ_{sw}.

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

$$p_i = p_{\text{sw,WH}} + \rho_m g \left(\text{TVD} - \text{TVD}_{\text{WH/BOP}}\right), \tag{1}$$

where g is the gravitational constant, and $p_{\text{sw,WH}}$ is the hydrostatic salt water pressure at the wellhead given by

$$p_{\text{sw,WH}} = \rho_{sw} g \left(\text{TVD}_{\text{WH/BOP}} - \text{TVD}_{\text{RKB}}\right). \tag{2}$$

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