

Load case - fluid gradient

Oliasoft

Abstract

In this document we describe the load case *Fluid gradient* available in the Oliasoft™ application.

Introduction

Fluid gradient is a collapse load case, where the unknown is the external pressure profile of the tubing¹. As the name suggests, the external pressure profile is given by the hydrostatic pressure.

Inputs The following inputs define the fluid gradient 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 hanger of the tubing, TVD_{hanger} .
 - b) The shoe of the tubing, TVD_{shoe} .
- 3) The mud weight/density, ρ_m .

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

$$p_e = \rho_m g \text{TVD}, \quad (1)$$

where g is the gravitational constant.

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