

Núcleo de Simulação Termo-hidráulica de Dutos

Numerical Simulation of Gas Pipelines

SIMDUT – Pipeline Thermo-Hydraulic Simulation Group – is a laboratory of the Department of Mechanical Engineering of PUC-Rio. One of its main areas of activity is focused on the development and utilization of specialized softwares for the analysis of gas pipelines to support the areas of pipeline operation, planning and reliability studies.

Conducted Studies on Gas Pipelines

The activities of SIMDUT with gas pipeline studies started in 2001 with the preparation of a technical audit report, developed to verify the transport capacity of the Bolivia-Brasil gas pipeline for ANP (Petroleum National Agency).

Since 2003, SIMDUT has been continuously assisting TRANSPETRO gas transport operations through computational simulation of its gas network.

In 2007, in a project sponsored by El Paso, a dynamic simulator of gas pipeline networks was developed. In the same year, SIMDUT analyzed for EPE (Brazilian Government Energy Research Company), the operational conditions of the Brazilian natural gas pipeline network, considering its projections for the next fifteen years of supply and demand and new pipeline construction projects..

In 2010, SIMDUT has prepared an Operational Manual of the gas pipelines Urucu-Coari and Coari-Manaus for Petrobras.

Dynamic Simulation of Delivery Stations

A dynamic simulator of gas delivery stations was developed to be used as an auxiliary tool for design, optimization, and verification of the operational conditions of natural gas delivery stations.

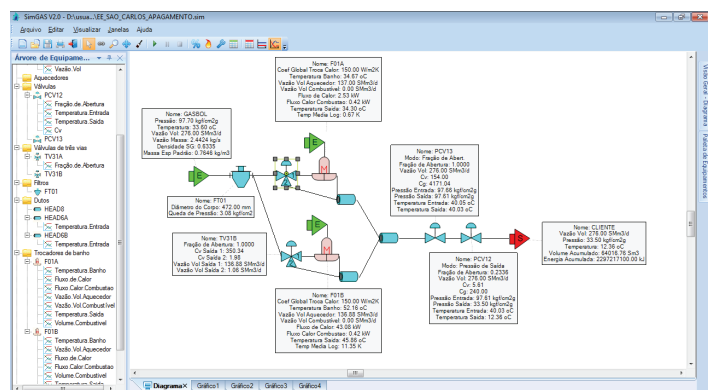
The simulator calculates the pressure drop and flow rate across each equipment present in the delivery station. To this end, the conservation equations, thermodynamic properties of the gas, equipment characteristics, and the automation of the control meshes were all modeled, in order to predict the dynamic behavior of the delivery stations.

Simulation for Reliability Analysis

Over the last years, there has been a growing interest on the development of reliability programs for the national gas pipeline network. These studies are conducted to evaluate the safety of the gas supply chain, and to point out its vulnerabilities and restrictions.

Complex reliability models are used to point out the events or incidental scenarios that may lead to a reduction or interruption of the gas supply. The results of thermo-hydraulic simulations of the gas pipeline network are the main input for this kind of study.

SIMDUT has participated in the reliability studies developed by Petrobras Gas&Energy during the years of 2009 and 2010, simulating the integrated Brazilian gas pipeline network in situations of normal operation and for incidental scenarios.



CONTACTO

www.simdut.com.br
simdut@simdut.com.br
Tel.: 55 21 3527-1018



SIMDUT