

This paper discusses transient processes in natural gas pipelines. The method of characteristics (MOC) is applied for the analysis of two transient categories, where the governing one-dimensional, hyperbolic conservation equations are linearized and solved without neglecting any of their term. First, we present a parametric study of the pressurized flow encountered when pipelines are utilized for the transportation or the temporary storage of natural gas. The non-ideal compressibility of natural gas is included in the model and its impact on the thermo-hydraulic processes is elucidated. Second, we model the hydrodynamics of a pipeline whose downstream boundary is a periodic discharge rate. The results show that, in response to these boundary conditions, the pressure distribution in the pipeline also undergoes periodic variations. Furthermore, our simulation results confirm the usefulness of MOC for numerical simulation of flow phenomena in pipelines