

Uncertainty variation of a fiscal orifice measurement system used in an Algerian natural gas exportation station is studied using data from a natural gas production field known as Gas Tin Fouye Tabankort (GTFT) located in the south-east of Algeria. The expected results are uncertainty calculus over a range of temperature and pressure variation and to the customs authorities' allocation.

In fact, each quantity of measured fluid flow has certain uncertainty and then the fiscal measurement station is very important for gas exportation, which means the income. Therefore, the pursuit of flow metering device uncertainty and its influence on the measured quantities in the transmission networks is very important. For that, the uncertainty caused by flowmeter in the measurement station causing economical revenue fluctuations is studied. The work was done to justify why there is a production decrease of hydrocarbons without identifying reasons during summer. The difference between the mass flow rate quantity produced and the transmitted value was important that is why our work is done to clarify exactly from where the problem can come.

The measurements setting with two operating conditions (gas temperature and pressure) show that the uncertainty is dominated by seasonal temperatures and pressures variations which induce fluctuation in gas and pipe temperatures and influence the metrological performance of the transmitters. Indeed, the metrological measurement chain performance is affected also by these two operating conditions.

The present work is done according to the ONML (National Legal Metrological Office) instructions regarding differences between the measured and the seller values represented by the mass flow rate.

In natural gas transmission network, the important problem in the management and control of the network is represented by the unaccounted for gas, a quantity of measuring error which is to be considered in the equation of network balancing. One of the unaccounted for gas sources are the environmental conditions and systematic measurement errors.

In this work, the calculation of the combined uncertainty of the mass flow rate measured by an Orifice fiscal gas metering plant is done. From the results founded, the authors confirm that the uncertainty in the measurement system causing by the climatic conditions generates unaccounted for gas.