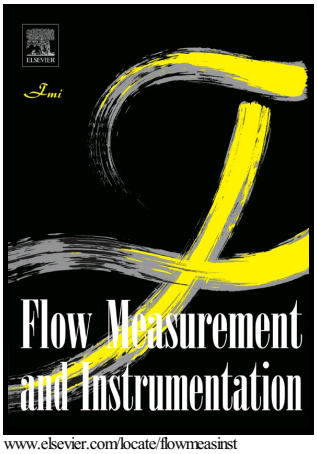

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Construction of the new gas meter high pressure calibration facility – technical and metrological problems

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Abstract

The necessity of the gas flowmeters calibration with the use of gas at expected working pressure is now beyond dispute. Most of gas meters types show the sensitivity to the parameters of the measured gas. The calibration factor, usually expressed as number of pulses per unit of volume, shifts when there is a change of an operating pressure. Change of operating pressure causes shift of calibration curve - so gas meters should be calibrated as close to operating conditions as possible. Polish Gas Transmission System Operator GAZ-SYSTEM SA decided to build the High Pressure Gas Meters Calibration Facility (HPCF) where natural gas is used as a working medium. The paper presents measures taken to overcome technical and metrological problems encountered during design and construction of the facility.

Keywords: Gas meters calibration; high pressure calibration facility; traceability; flow measurement uncertainty

1. Introduction

It is known for decades that both pressure [1] and temperature [2] affect the turbine gas meters characteristics. Also other types of gas meters types show the sensitivity to the parameters of the measured gas. Gas meters should be therefore calibrated close to operating conditions - several standards recommend calibration of gas meters with the use gas under working pressure, e.g. [3], [4] for turbine gas meters or [5] for ultrasonic gas meters, others make recommendation how these calibration should be conducted [6].

Although there are some advantages of the test facilities using alternate media, e.g. air or carbon dioxide [7] and it is possible to ensure in such cases density and Reynolds number