

Determination of uncertainty of a clamp-on ultrasonic meter under non-ideal conditions.

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The liquids and gas flow measurement has always been required in the industrial operations worldwide due to the needs to know the flow rate. Mexico is not an exception and currently several modifications to regulation related with energetic reform are in process. According to new guidelines emitted by Hydrocarbon National Commission, every cubic meter extracted from wells and its derivatives shall be measured. This work focuses on comparing the results obtained from a clamp ultrasonic flow meter with a reference standard Coriolis technology and determines its uncertainty under non-ideal condition because the installation was not originally designed to operate with an ultrasonic technology. However, this meter is utilized in operation and reference measurement where the limit of uncertainty are higher than in custody transfer. Although equipment has the disadvantage mentioned, its utilization can be justified by its price compared with a metering system. For this reason, is important to know the behavior of this meter under non-ideal conditions by the representing viability, where there is not metering point, and when the uncertainty limit and cost allow it. The installation was done in a 12 NPS pipe that conveys LPG and where minimum straight lengths of pipe required from the manufacturer do not exist. The comparison was performed in 3 meters run (FE-104, FE Fe 105 and FE-106), at three different flows and pipe configurations (upstream and downstream) similar. In addition, in two meters run, the upstream valves were kept whole opened, while on the third- meter run during the test the upstream valves were regulated in three ways: partially closed, half opened and completely opened. With the results it was possible to find a correction factor for systems with similarity pipe configurations, condition operations, fluids and so on.
