Flow Meter Temperature Measurement

S M Kumar
Process Design Consultant
Top Contributor

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Query: Why is temperature measurement located downstream of flow element?

My Response: I understand that temperature measurement is usually 10 diameters downstream of the flow element, to prevent velocity profile distortions. In this location the mixing after the initial pressure drop thru flow orifice would be good.

NORSOK standard I-104 “Fiscal measurement systems for hydrocarbon gas” simply states that “Temperature shall be measured downstream of the flow meter” and Emerson’s “Fundamentals of Orifice Meter Measurement” states that “flowing temperature is normally measured downstream of orifice and must represent the average temperature of the flowing stream”. Let us hear from other members.

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Sue Chin

Sue Chin Lim
Principal Process Engineer at SBM Malaysia Sdn Bhd, CEng PEng MIChemE MIEM

For flowmetering requires temperature and pressure compensation, temperature instrument has always been placed downstream of the flowmeter because the flow velocity profile would have been well established as there is appropriate straight length being provided upstream of the meter hence providing a better temperature measurement since temperature profile would also be quite even as well as straight length requirement downstream the flowmeter is shorter, so temperature measurement can be done as close as possible to the meter to provide the required compensation.

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