

**REFERENCES**

**BIBLIOGRAPHIQUES**

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- AGA 3 – API 14.3**, ‘Orifice metering of natural gas and other related hydrocarbon fluids’ American Gas Association and American Petroleum Institute, 1991, 2000 (E)
- ASME 2530/ AGA3**, ‘Orifice metering of natural gas and the related hydrocarbon fuels’, 1980.
- Aichouni, M., Laws, EM and Ouazzane, AK**, ‘Experimental study of the effects of upstream flow condition upon venturi flow meter performance’., In *Flow Modelling and Turbulence Measurements VI*, Ed. Chen, CJ et al., Balkema, Rotterdam., 1996.
- Aichouni, M. Mous, M., Benchicou, S, Mouaici, M, Belghit, M. and Mechmeche, M**, ‘How flow meter condition affects measurements accuracy’, Proceeding of the 7<sup>th</sup> International Symposium on Flow Modelling and Turbulence Measurements, Tainan, Taiwan, October 5 – 7, 1998.
- Aichouni M. and Laribi B.** ‘Computational Study of the Aerodynamic Behavior of the Laws Vaned Plate Flow Conditioner ’, ASME Fluids Engineering Division Summer Meeting, Boston, USA, june 11-15, 2000.
- Aichouni M. et al.** 'Experimental Investigation of the Installation effects on the venturi flow meter performance', ASME Fluids Engineering Division Summer Meeting, Boston, USA, june 11-15, 2000.
- Aichouni M. et al**, 'Experimental Investigation of the Installation Effects on Venturi and Orifice Flow Meter', 10<sup>th</sup> Int. Metrology Congress. Saint Louis, France, 22-25 2001.
- Akashi, K, Watanabe, H and Koga, K**, ‘Flow rate measurement in pipe line with many bends’, Mitsubishi Heavy Industries, Vol. 15 N° 2, pp. 87-96, 1978.
- Barbin, A.R, Jones, J.B**, ‘Turbulent flow in the inlet region of a smooth pipe’. Trans. ASME, Journal of Basic Engineering, Vol. 85, p. 29, 1963.
- Barg P., Sawchuk, B and Sawchuk, D.**, 'Retrofitting tube bundles with the CPA 50E flow conditioner – A standards driven issue', Canadian Gas Association 2000, Gas Measurement School, June 2000.
- Barg P., Sawchuk, B and Sawchuk, D.**, 'API 14.3 Flow Conditioner Performance : Test for the CPA 50E Flow Conditioner', Canadian Pipe Lines Accessories Company Ltd, 2001.
- Barry J. J. and al**, 'Numerical simulation of flow through orifice meters', Gas research institute GRI-92/0060.1, 1992
- Barton N.**, ‘CFD techniques applied to differential pressure flowmeter performance’, Flow Measurement Guidance Note N° 20, National Engineering Laboratory, UK, October 1999.

**Barton N.**, 'Assessment of the performance of flow conditioners at elevated Reynolds numbers', Flow Measurement Guidance Note N° 29, National Engineering Laboratory, UK, May 2002.

**Botros et al**, ' Effect of Turbulence on Orifice Meter Performance', Journal of Offshore Mechanics and Arctic Engineering-ASME, Vol. 116, pp. 77-85, 1994

**Boukhiar, M.**, 'Systèmes de comptage de gaz à SONATRACH', Séminaire National de métrologie, Université de Mostaganem, 14-15 Mars 2001.

**Bowles, E. C.**, 'Natural gas flow measurement in the 21<sup>st</sup> century', Pipe line and gas Journal, Vol. 26, N° 7, pp. 16-21, July 1999.

**Brennan, J.A., Sindt, C.F., Lewis, M.A., and Scott, J.L.**, 'Choosing flow conditioners and their Location for Orifice Flow Measurement'. *Flow Measurement and Instrumentation*, Vol. 2, Number 1, pp. 40-44, 1991.

**Chen C.J.**, 'Flow modelling and turbulence Measurements VI', Balkema, Rotterdam, 1996.

**Chirigui, M.**, 'Etude Expérimentale des effets d'installations sur les débitmètres à organe déprimogène utilisés dans le comptage des fluides industriels', Thèse de Magister, Université de Mostaganem, 2003.

**Erdal A.** , 'A numerical investigation of different Parameters that affect the performance of a flow conditioner', *Flow Meas. Instrum.*, Vol. 8, N°2, pp. 93-102, 1997

**Erdal A. et Andersson H.I.**, 'Numerical aspects of flow computation through orifices', *Flow. Meas. Instrum.*, Vol. 8, N° 1, pp. 27-37, 1999

**Feener D.M.**, 'Applying flow conditioning', Control Engineering online Journal, Issue January 1999.

**Gallagher P.E. et Saunders M.P.**, 'Isolating flow conditioners bring unparalleled accuracy to metering stations', AGA 3 GFC Qualifications, Savant Measurement Corporation USA, 2001.

**Gajan, P., Hebrard, P., Millan P. and Giovannini A.**, 'Basic study of flow metering of fluids in pipes containing an orifice plate', Gas Research Institute Report n° 5086-27-1412, 1991.

**Gajan P. et al**, 'Design of a tube bundle conditioner from aerodynamic concepts', ONERA/CERT/DERMES –1995

**Heritage J. E.**, ' The performance of transit time ultrasonic Flow-meters under good and disturbed flow conditions', *Flow Meas. Instrum.*, 1, pp. 24-30, 1990

**Hilgenstock A. et R. Ernest**, ' Analysis of installation effects by means of Computational fluid dynamics – CFD versus experiment ', *Flow. Meas. Instrum.*, Vol. 7, N°3/4, pp. 161-171, 1996

**Hinze, J. O.**, 'Turbulence'. McGraw-Hill, 2nd Edition, New York, 1975

**Huang, C.J and Leschziner, M**, 'Parabolic Solution Solver Applied for Boundary Layer flows', UMIST, UK, 1985.

**Humphreys J. S. and al**, 'Investigation of the effectiveness of flow conditioners', Proceedings of the International Symposium on fluid flow measurement. Washington D.C, American gas association, pp 883-897, 1986.

**Husain Z.D.** , 'Theoretical uncertainty of orifice flow measurement', Daniel Flow Products, 1995.

**Irving, S. J.**, 'The effect of disturbed flow conditions on the discharge coefficient of orifice plates', Int. J. Heat Fluid Flow 1 , pp. 5-11, 1979

**ISO 5167**, 'Measurement of fluid flow by means of pressure differential devices inserted in circular cross section conduits running full', International Standards Organisation, 1991, 1999 (E), 2001 (E).

**Kado H. and al** , 'Production of fully developed pipe flow using perforated plate', JSME International Journal, Vol. 30, N°261, 1987.

**Karnik U.**, ' Towards a New Flow Conditioner', Confidential Report no 00661 to AGTD, 1991

**Karnik U. et al**, ' Effect of turbulence on orifice meter performance', OMAE, Vol V-A, Pipeline Technology, pp 19-29, 1992

**Karnik U. et al**, ' Measurement of the Turbulent Structure downstream of a Tube Bundle at High Reynolds Numbers', ASME-Fluid Engineering Conference, Washington D.C, 1993.

**Karnik U.** 'A compact Orifice Meter/Flow Conditioner Package', 3<sup>rd</sup> International Symposium of Fluid Flow Measurement, San Antonio Texas, USA, 1995

**Karnik U. and Kowch**, 'Scale up Tests the nova Flow conditioner for Orifice Meter Applications', 4<sup>th</sup> International Symposium of Fluid Flow Measurement, Denver, Colorado,USA, 1999.

**Laribi B., Wauters P. and Aichouni M.**, 'Experimental Study of the Decay of Swirling Turbulent Pipe Flow and its Effect on Orifice Flow Meter Performance', ASME Fluids Engineering Division Summer Meeting, FEDSM'01, May 28. 2001.

**Laribi, B. , Waters, P. and Aichouni, M.**, ' Experimental Study of Aerodynamic Behavior Downstream of Three Flow Conditioners', ASME Fluids Engineering Division Summer Meeting, Montréal, Canada, July 14-18, 2002.

**Laribi, B. , Waters, P. and Aichouni, M.**, ' A Comparative study of the aerodynamic behavior of three flow conditioners – Part I', The European Journal of Mechanical and Environmental Engineering' , Vol. 48 (1), March 2003.

**Laufer J.**, 'The structure of turbulence in fully developed pipe flow', NACA Report 1174, 1954

**Lawn, C.J.** ' The determination of the rate of dissipation in turbulent pipe flow', J. of Fluid Mechanics, vol. 48, p. 477 (1971)

**Launders, B.E. and Spalding, D.B.**, 'Mathematical Models of Turbulence', Academic Press, London and New York, 1972.

**Launders et Spalding, D.B.**, « The numerical computation of turbulent flows », Computer methods in applied Mechanics and Engineering, Vol. 3, p.269, 1974

**Launders, B.E.**, 'Turbulence modelling for CFD applications', UMIST, 1989

**Laws E.M.** , 'Flow Conditioning- a new development ', Flow Meas. Instrum., Vol. 1, 1990

**Laws E.M. and A.E.K. Ouazzane**, ' Effect of plate depth on the performance of a Zanker flow straightener', Flow Meas. Instrum., Vol. 3, N°4, 1992

**Laws E.M. and A.E.K. Ouazzane**, ' Short installation for accurate orifice Plate flow meter', FED-Vol. 193, Turbulence Control, ASME 1994

**Laws E.M. and A.E.K. Ouazzane**, ' Compact Installations for differential flowmeters', Flow Meas. Instrum., Vol. 5, N°2, 1994

**Laws E.M. and A.E.K. Ouazzane**, ' A furthur investigation into flow conditioner Design yielding compact for Orifice plate flow metering', Flow Meas. Instrum., Vol. 6, N°3, pp. 187-199, 1995

**Laws E.M. and A.E.K. Ouazzane**, ' A preliminary study into the effect of length on the performance of the Etoile flow straightener', Flow Meas. Instrum., Vol. 6, N°3, pp. 225-233, 1995

**Laws E.M. and A.E.K. Ouazzane**, ' A further study into the effect of length on the Zanker flow conditioner', Flow Meas. Instrum., Vol. 6, N°3, pp. 217-224, 1995

**Lim E. H.**, 'Spatial Variation of Velocity profile and Turbulence Structure in Turbulent Internal Flow ', Ph.D. Thesis, University of Salford, U.K., 1980

**Mah, D. and Paterson, W.**, 'Implementing new technology at Trans Canada meter stations – better, faster, cheaper', The 2001 Gas Measurement School, Canada, June 2001.

**Markatos, N.C.**, 'The mathematical modelling of turbulent flows'. Applied Mathematic Modelling, Vol. 10, p. 190, 1986.

**Mattingley G. E. and T. T. Yeh**, ' Effects of pipe elbows and tube bundle on selected types of flow-meters', Flow Meas. Instrum., 2, pp. 4-13, 1991

**Merzkirch, W. and Kalkühler, K.**, 'Velocity and turbulence measurements in the flow downstream of flow conditioners', Advances in Fluid Mechanics and Turbo machinery, eds. H.J. Rath, C. Egbers, pp. 125-135, Springer-Verlag, Berlin, 1998.

**Merzkirch, W.** 'Flow metering in non-developed pipe flow', The 6<sup>th</sup> Asian Symposium on Visualisation, Pusan, Korea, May 2001.

**McHugh, A., Kinghorn, FC and Dyet, WD**, 'The efficiency of an Etoile flow straightner in non symmetric swirling flow upstream of orifice plates', NEL report N° 692, 1984.

**McFaddin et al**, 'The effect of the location of an in-line tube bundle on orifice flow-meter performance', Journal : Flow. Meas. Instrum., Vol. 1, pp. 9-14, 1990.

**Merzkirch. W.**, 'Flow metering in non developed pipe flow', Paper N° 171, 6<sup>th</sup> Asian Symposium on Visualisation, Pusan, Korea, May 2001.

**Messoul A.**, 'Etude numérique des écoulements turbulents dans les conduites lisses et rugueuses', Thèse de Magister, Université de Chlef, 2000.

**Morrison G. L. Ihfe L. M, and DeOtte R.E.**, 'Numerical study of the effects of upstream flow conditioners upon orifice meter performance', Proceedings, 11th international offshore and arctic engineering, Alberta, Canada, 1992.

**Morrison G. L. Ihfe L. M, and DeOtte R.E.**, 'Effects of flow conditioner exit velocity upon downstream flow development', Fluids Engineering Conference, The American Society of Mechanical Engineers, June 1994.

**Morrison G. L. Ihfe L. M, and DeOtte R.E.**, 'Flow development downstream of a standard tube Bundle and three different porous plate Flow conditioners', Flow Meas. Instrum., Vol. 8, N°2, pp. 61-76, 1997.

**Morrow T.**, 'Orifice Meter Installation Effects in the GRI MRF', 3<sup>th</sup> International Symposium of Fluid Flow Measurement, Southwest Research, San Antonio, Texas, 1995

**Morrow T.**, 'Orifice Meter Installation Effects', AGA Operations Conference, Southwest Research Institute , San Antonio, Texas, 1997

**Morrow T.**, 'Orifice Meter Installation Effects : Development of a flow conditioner Performance Test', Technical Memorandum Metering Research Facility Program, GRI-97/0207, San Antonio, Texas, 1997

**Mous M.**, 'Etude expérimentale et numérique des effets d'installation sur les débitmètres Venturi', Thèse de Magister, Université de Mostaganem, 1998.

**Ouazzane A.E.K. and M. Barigou**, 'A comparative study of two flow conditioners and their efficacy to reduce asymmetric swirling flow effects on orifice meter performance', Trans IChemE, Vol. 77, Part A, November 1999.

**Paik, S.J.**, 'Flow measurement in the 21<sup>st</sup> century - Looking to the conference in the year 2005', FLOWMEKO 94, National Engineering Laboratory, U.K, June 13-17, 1994.

**Patankar, S.V.**, 'Numerical heat transfer and fluid flow', McGraw-Hill Book Company, 1980.

**Reader Harris, M.J, and Keegans, W**, 'Comparison of computational and LDV measurements of flow through orifice and perforated plates, and computation of the effect of rough pipe work on orifice plates'. *Int. Symp. on Fluid Flow Measurements, Nov. 16-19, 1986.*

**Reader Harris**, 'Installation effects on Venturi tubes', Flow Measurement Guidance Note, N° 2, National Engineering Laboratory, United Kingdom, June 1997.

**Rodi, W.**, 'Turbulence models and their application in hydraulics'. Institut fur Hydromechanik SFB-80, University of Karlsruhe, Karlsruhe, West Germany, 1980.

**Satary, J.**, 'Flow conditioners performance review', Flow Measurement Guidance Note N° 11, National Engineering Laboratory, UK, June 1998.

**Sawchuk D.B. and Peck, B.**, 'Flow conditioning for natural gas measurement', Canadian Gas Association, Gas Measurement School, 1998.

**Shen J.J.S.**, 'Characterisation of swirling flow and its effects on orifice metering', SPE Paper 22865, 66<sup>th</sup> annual conference and exhibition of the society of petroleum engineers, Dallas, TX, USA, 1988.

**Spearman E.P., J.A. Sattary and M.J. Reader-Harris**, ' Comparison of velocity and turbulence profiles Downstream of perforated plate and flow conditioners', *Flow Meas. Instrum.*, Vol. 7, N°3/4, pp. 181-199, 1996

**Spitzer, D.W.**, 'What affects flow meter performance'. *INTECH*, vol. 40(2), 1993, pp.24-27.

**Wauters P. et al**, 'Considérations sur les dispositifs anti-giratoires et présentation d'un nouveau redresseur en Etoile', PROMOCLIM E, Tome 7E-2 –juin 1976

**Wendt G. and al**, ' Systematic investigation of pipe flows and installation effects laser Doppler anemometry - Part I. Profile measurements downstream of several pipe configurations and flow conditioners', *Flow Meas. Instrum.*, Vol. 7, N° 3/4, pp. 141-149, 1996

**Xiong, W. and Merzkirch, W.**, 'Visualisation of the near field downstream of flow conditioners', 8<sup>th</sup> International Symposium on Flow Visualisation, Sorrento, Italy, 1998.

**Yeh, T.T and Mattingly, G.E**, 'Flow meter installation effects due to a generic header', NIST Technical note 1419, 1996

**Zanker, k.j.**, 'The development of a flow straightener for use with orifice-plate flow-meters in disturbed flow', Paper D2, Nel conf. Flow meas. in closed conduits, HMSO PP. 398-415, 1962

**Zimmermann H.**, 'Examination of disturbed pipe flow and its effects on flow Measurement using orifice plate', *Flow Meas. Instrum.*, N°10, pp. 223-240, 1999