CURRICULUM VITAE

Dr. Mohamed AICHOUNI

Web Site : http://aichouni.tripod.com/

Education / Qualifications

- **Ph.D** in **Mechanical and Aeronautical Engineering**, 1992, The Aeronautical and Mechanical Engineering Department, **University of Salford**, **Manchester**, ***The United Kingdom***.
  Thesis Title : Decay and Development of Turbulent pipe flows – An experimental and Computational Study

- **English Language Test Specifications**, 1988, University of Oran, Algeria /The British Council

- **BSc** in Marine Engineering (with high Distinction), 1987, Department of Marine Engineering, University of Science and Technology of Oran, Algeria

Professional Experience

- **Assistant Professor *(2001 – Present),*** The Mechanical Engineering Department, Hail College of Technology, Kingdom of Saudi Arabia**.**

- **Associate Professor** *(1996 – 2001),* Faculty of Sciences and Engineering, University of Mostaganem, Algeria.

- **Assistant Professor** (1992-1996), Faculty of Sciences and Engineering, University of Mostaganem, Algeria.

- **Part time Laboratory Demonstrator** *(1988 – 1992)*: Aeronautical and Thermo-Fluids laboratories, The Aeronautical and Mechanical Engineering Department, University of Salford, The United Kingdom.

Taught Courses:

(1) ***Graduate level*** *:*

Quality Control (*with one book published***)**
Industrial Metrology (*with one book published***),**
Manufacturing Systems
Fluid Mechanics, Fluid Dynamics
Thermodynamics and Heat Transfer
Industrial Statistics
Renewable Energies
Engineering Mathematics, Numerical Analysis
Physics.

(2) ***Post-graduate level*** :

Computational Fluid Dynamics
Experimental Fluid Dynamics,
Heat and Mass Transfer,
Environmental Engineering.

Design of Web-Based Courses (e-Learning) in the areas of Quality Control (http://hctmetrology.tripod.com/quality), Metrology (http://hctmetrology.tripod.com), and Manufacturing Systems (http://hctmanufacturing.tripod.com). The e-courses are classified by the Google search engine among the first sites out of hundreds of thousands of sites.

Post-Graduate Theses Supervised (*)

- **05 MSc and 1 PhD Theses** *(have been Advised up to final discussion)*

- **Currently 2 PhDs** are being prepared under my supervision (2006-present).

- **Scientific head of a Master programme** in the area of Applied Thermo-Fluid Mechanics. 1999/2001 at the University of Mostaganem (All students have discussed their theses).

Research Experience

- **Principal Researcher and Leader of Externally Funded Research Projects** in the areas of ***flow metering, flow conditioning, drag reduction in pipelines and pipe networks***. The research projects were funded by the National Agency of Scientific Research Development (ANDRU-Algeria) (1992-2001).

- **Member of a research group at King Abdualazziz City of Scineces and Technology** working on a project (kacst N. 138-28) with the aim to develop a strategic plan for the **National Quality Centre** (January 2007-Now).

- **External Examiner** of more than 30 MSc and PhD theses and 50 BSc Projects.

- **Reviewer** of the Journal of Fluids Engineering (The American Society of Mechanical Engineers).

Research interests

My current research interests include:

- Quality Control, Quality Management
- Statistical Process Control and Quality in Services and Manufacturing.
- Dimensional Metrology and Manufacturing Systems.
- Experimental and Computational Fluid Dynamics Techniques and their applications to industrial fluid flows; Flow metering and flow conditionning systems.
- Heat and mass transfer; Double diffusive-convection in annular cavities.
- Mathematical and Numerical Modeling of Physical Phenomena
- Web based Engineering Education, Quality in Engineering Education, Curriculum Development.
- Strategic Planning.

Administrative Experience

- **Vice Rector of the University** of Mostaganem (Algeria) *(1994 – 2001)*
  In charge of ***Post Graduate Studies, Scientific Research and External Relations***.

- **General Supervisor of the Council of Technical Education and Vocational Training at the Region of Hail** and **Quality Coordinator** *(February 2006 – January 2007).*

- **Chairman of The Mechanical Technology Department,** Hail College of Technology (Saudi Arabia) *(August 2006 – present)*

Honors / Awards / Affiliations / Membership

- **Certified Assessor** at the *King Abdual Azziz Quality Award* (KAQA) (2007-2008).
- **Member of** *Curriculum Development Team* working on the sylabus of *Quality Technician Degree* at the TVTC (2007-2008).
- Member of *the Arab Institute of Operations and Maintenance(2005-2006)*
- Member of the *National Committee for the evaluation of research projects*, Ministry of Higher Education and Scientific Research, Algeria. *(1996-2001)*
- Member of the *National Working Group on Metrology*, Ministry of Industry and the National Organisation of Legal Metrology, ONML, Algeria. *(2000-Present)*
- Associate Member of *the American Society of Mechanical Engineers, ASME (1990-1994)*
- PhD Fellowship: Under the British and the Algerian Governments technical co-operation program *(1988-1992).*
- Supervisor of the *Metrology Section at the Technical Discussion Forum* (www.tkne.net/vb) and the *Quality Control Section at the Arabic Statistician Discussion Forum* (www.arabicstat.com/board/) .

Other Certificates Awarded and Advanced Courses Attended

- King Abdulazziz Quality Award Training courses, held by Saudi Arabian Standards Organisation (SASO), in Al-Khobar and Riyadh (2007).
- Training courses (20hours) on AutoCAD, Machining and Metal Forming held at Hail College of Technology (2007).
- Computational Fluid Dynamics (CFD) Workshop held at the Imperial College of London, 1991.
- Industrial Flow Metering Course, held at the National Engineering Laboratory, East Kilbridge, U.K., 1991.
- Fluid Flow and Heat transfer modelling workshop, held in UMIST , The United Kingdom, 1990
- Advanced Computational Fluid Dynamics Course , held at UMIST, The United Kingdom, 1989.

Community Services

During the period 2001- 2007, I developed and delivered training courses at Hail College of Technology on 'Total Quality Control Management', 'Statistical Process Control', Metrology and Quality Control in the perspective of the ISO 9000', Information Technology - Tools for the Engineer and the Technician'.
In Algeria (2000-2001) I developed and delivered training courses to industrial engineers on Basic Concepts of Metrology and its industrial Applications in the view of global economical changes', 'Industrial fluid flow Metrology – Theory and Applications'.

Other Skills

- **Programming Languages** : Fortran, Java, Visual Basic and HTML.
- **Computer Packages** : AutoCAD, Tecplot 7.0, Matlab7.0., Windows Operating System, Microsoft Office 2000 (Word, Excel, Access, FrontPage, Visio, MindJet).
- **Languages** : Fluent in English, French and Arabic.

Contacts

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Mobile: 00966- 508968402 **Email :** m_aichouni@yahoo.co.uk **Web site** : http://aichouni.tripod.com

List of Major Publications

1 – Books

- ***Aichouni, Mohamed***, '**Quality Control – The Basic Tools and their Applications in Manufacturing and Services**', (In Arabic), ISBN 6690-75-688-2, Dar Al-Asshab Book Publishing, Ryiadh, 2007 (*Included a Computer Based Training CD*).

- ***Aichouni, Mohamed,* 'Fundamentals of Dimensional Metrology for ISO 9000** Quality Standards', A textbook in Arabic, to be published by Al-Obeiken book publishing, July 2009.

2 – International Journals and Edited Books Chapters

- Retiel, N., Bouguerra, E. h. and ***Aichouni, M***., `Effect of curvature ratio on cooperating double-diffusive convection in vertical annular cavities`, ***Journal of Applied Sciences***, Vol. 6, N. 12 , pp. 2541-2548, 2006.

- ***Aichouni, M***., `Statistical Quality Control Techniques`, ***Quality***, The Quarterly Bulletin Issued from the Total Quality Center of Abu Dhabi Police, pp. 10-11, N 6, September 2005.

- Laribi, B. , Waters, P. ***Aichouni, M***, and Ouali, M. ' Further analysis of the aerodynamic behaviour of flow conditioners', ***The European Journal of Mechanical and Environmental Engineering'*** , Vol 48 N 3, pp. 167-176, Sept 2003.

- Laribi, B. , Waters, P. and ***Aichouni, M***, ' A Comparative study of the aerodynamic behaviour of three flow conditioners', ***The European Journal of Mechanical and Environmental Engineering'*** , Vol. 48 (1), pp. 21-30, March 2003.

- ***Aichouni M.*** and Laribi B., 'Computational study of the aerodynamic behaviour of the Laws vaned plate flow conditioner', Paper N° FEDSM2000-1106; ***In Forum on Fluid Measurement and Instrumentation,*** 2000 ASME Fluids Engineering Conference, Boston, USA, June 11-15, 2000.

- ***Aichouni***, ***M***, Laribi B., Retiel, N, Houat, Nehari D and Benchicou, S, 'Experimental investigation of the installation effects on the Venturi flow meter performance', Paper N° FEDSM2000-1107***; In Forum on Fluid Measurement and Instrumentation***, 2000 ASME Fluids Engineering Conference, Boston, USA, June 11-15, 2000.

- ***M. Aichouni,*** E.M. Laws, A.K. Ouazzane, 'Experimental Study of the effects of upstream flow condition upon Venturi flow meter performance', Presented at 'The 6th International Symposium on Flow Modelling and Turbulence Measurements', Florida, USA, September, 8-10, 1996. Published In ***'Flow modelling and turbulence measurements',*** ed. C.J. Chen et al., A.A. Balkema , Roterdam, The Netherlands.

- E. M. Laws ***and M. Aichouni***, 'An evaluation of the accuracy of Hot-wire measurements'. ***Thermal Anemometry 1993, FED-Vol. 167, pp. 135-143;*** Edited by D.E. Stock et al. The Fluid Engineering Conference; Washington, D.C. U.S.A. June, 20-24 ,1993.

- E. M. Laws and ***M. Aichouni***, 'A Comparative study of two turbulence Models in Predicting the development of initially distorted Turbulent Pipe flows'. ***In Data for Validation of C.F.D Codes,***

FED-Vol. 146, pp. 45-60; Edited by Dan Goldstein et al. The Fluid Engineering Conference; Washington, D.C. U.S.A, June, 20-24 ,1993.

- ***M. Aichouni*** and E. M. Laws, 'Computational treatment of initially distorted pipe flow'. ***In Forum on Turbulent flows - 1991, FED - Vol 112,*** pp. 171-177. Edited by M.J. Morris et al. 'The first ASME / JSME Fluids Engineering Conference'. Portland, Oregon, USA. June 23-27, 1991.

- E. M. Laws and ***M. Aichouni***, 'Analysis of the decay of turbulent pipe flow - A preliminary study'***. In Forum on Turbulent Flows - 1990, FED-vol. 94, pp. 51-56.*** edited by W.M. Bower et. al. '1990 ASME/CSME Fluids Engineering Conference', Toronto, Canada. June 4-7, 1990.

3 – International Conferences and Proceedings

- ***Aichouni, M*** and Benchicou S, `Back to Basics : The seven basic quality tools and their applications in manufacturing and services`, *The 2nd Quality Congress Middle East (QC2008),* Dubai, UAE, April, 6-9, 2008.

- Retiel, N, ***Aichouni, M*** and Bouguerra, E.H., `Numerical Investigation of transient formation of multilayered structures associated with double diffusive convection in annular cavities', Presented at the *3rd International Conference on Thermal Engineering – Theory and Applications,* Amman, Jordan, May 21-23, 2007.

- ***Aichouni, M*** and A. S. Al-Harbi, ` Quality Education and Training – Experience with an Arabic web-based e-Learning course on Quality Control`, e-Proceedings of the *1st International Congress of the Middle East Quality Association (MEQA-07-UAE),* Dubai, UAE, March, 25-27, 2007. (ISBN : 978-9948-03-410-0).

- ***Aichouni, M***, 'Measurement of the Quality of the Industrial Maintenance Training Program from the Saudi Market stand point (in Arabic)', Proceedings of *The 4th Saudi Technical Conference and Exhibition*, GOTEVOT, Riyadh, Kingdom of Saudi Arabia, December, 2-6, 2006.

- ***Aichouni, M***. and Benchicou, S., 'How Technical College Courses become Successful web-based e-Learning Models Through the Integration of Teaching, Research and Community Services Activities', Proceedings of the *4th International forum on Engineering Education (IFEE-2006)*, Sharjah University, The U.A.E, 25-27 April, 2006.

- Al Nais M. O. and ***Aichouni, M***. `Industrial Maintenance Education and Training in the new millennium`, Proceedings of the 4th International Operation and Maintenance Conference in the Arab Countries OMAINTEC 2005, Beirut, 20-23 June 2005.

- ***Aichouni, M***, and Al Nais, M O., 'e-Learning in Technical Education and Vocational Training: From Concepts to Practice', Proceedings of the *3rd Saudi Technical Conference and Exhibition*, GOTEVOT, Riyadh, Kingdom of Saudi Arabia, December, 11-15, 2004.

- ***Aichouni, M***, and Belebna, M., 'Metrology Training at the Technical Education and Vocational Training`, Proceedings of the *3rd Saudi Technical Conference and Exhibition*, GOTEVOT, Riyadh, Kingdom of Saudi Arabia, December,11-15, 2004.

- Al Nais, M.O. and ***Aichouni, M***. `Web-based Approach Applied to Technical Courses to Enhance Engineering Education Quality`, Proceedings of the *1st Baha Technical Meeting*, Vol 2, pp 131-137, Baha College of Technology, May, 3-5 ,2004.

- ***Aichouni, M.*** and Al Nais, M.O. `Computer Based demonstrations of Statistical Quality Control for Engineering Students`, Paper N: Comp 132, *The 2nd Saudi Science Conference*, King Abdul Azziz University, Jeddah, 15-17 Marsh 2004.

- Benchicou, S and ***Aichouni, M.*** `Computational Study of the Aerodynamic Behavior of Flow Conditioners Used in the Oil and Gaz Industry`, Paper N: Eng 132. *The 2nd Saudi Science Conference*, King Abdul Azziz University, Jeddah, 15-17 Marsh 2004.

- ***Aichouni, M*** and Al Nais M. O., 'Interactive Demonstrations of Statistical Quality Control for Engineering Students using Computer-Based Tools', The Third Forum on Engineering Education, Sharjah University, UAE, October 14-15, 2003.

- ***Aichouni, M*** , Laribi, B., Benchicou, S. and Chirigui M. 'Metrological aspects of Industrial flow metering systems', *The 4th Middle East Refining and Petrochemicals Exhibition and Conference,* Bahrein, 29 Sept-01 Oct, 2003.

- ***Aichouni, M***, Al Nais, M. and Laribi B., 'On the metrological performances of differential flow meters',Proceedings of *The 6th Saudi Engineering Conference: Engineering and Engineering Education* , vol. 5, pp. 97 – 101, King Fahd University of Petroleum and Minerals, Dahran, Kingdom of Saudi Arabia, December 14-17, 2002.

- ***Aichouni, M***, and Al Nais, M., 'An educational package on statistical quality control for engineering students', *The 2nd Saudi Technical Conference and Exhibition*, GOTEVOT, Riyadh, Kingdom of Saudi Arabia, October 26-30, 2002.

- Laribi, B. , Waters, P. And ***Aichouni, M***, 'Experimental study of the aerodynamic behavior downstream of three flow conditioners', Paper N° FEDSM2002-31080; The 2002 ASME Fluids Engineering Conference, Montreal, Quebec, Canada, July 14-18, 2002.

- ***Aichouni, M***., Laribi, and Wauters, P. 'Experimental investigation of the installation effects on Venturi and Orifice flowmeters', The 10th International Metrology Congress, BNM, Saint Louis, France, October 22-25, 2001.

- Laribi, B. and ***Aichouni, M***, 'Experimental study of the decay of swirling turbulent pipe flow and its effect on the orifice meter performance', Paper N° FEDSM2001-18039; 2001 ASME Fluids Engineering Conference, New Orleans, USA, May 29 – June 1, 2001.

- Benchicou, S. and ***Aichouni M***, 'An experimental investigation of the accuracy of industrial Venturi flow meters', The 5th International Meeting on Energetic Physics, University of Bechar, Algeria, November, 07 – 09, 2000.

- ***Aichouni M.*** and Messoul A., 'Numerical study of turbulent flow in smooth and rough circular pipes. The 5th International Meeting on Energetic Physics, University of Bechar, Algeria, November, 07 – 09, 2000.

- ***Aichouni M*** and Benchicou, S, 'Turbulence control by passive means - Applications to drag reduction', 2nd International Colloquium on marine sciences, Naval Forces Commandment, Algiers, May 29-31, 1999.

- ***Aichouni***, M, Mous, M. Benchicou, S.. Mouaici, M. Belghit, M. Mechmeche M, 'How flow meter condition affects measurements accuracy', 7th International Symposium on Flow Modelling and Turbulence Measurements', Tainan, Taiwan, October 5-7, 1998.

- ***Aichouni***, M, Mous, M. Benchicou, S.. Mouaici, M. Belghit, M. Mechmeche M, 'Experimental study of the effect of internal geometrical irregularities on the performance of a Venturi flow meter', 3rd Scientific and Technical Meeting of SONATRACH, Algiers, April, 19-22, 1998.

- ***M. Aichouni***, M. Mouaici, S. Benchicou, Y. Fergag, G. Farhi, M. Benni et A. Djedid, 'Experimental study of the installation effects upon a Venturi flow meter', Proceedings of the First Arab Congress on Mechanics, vol. 1, pp. 222-216, Damascus, Syria, 01-03 June 1997.

- ***M. Aichouni***, S. Benchicou, E.M. Laws, 'Numerical treatment of partial differential equations. Applications to thermo-fluid dynamics problems'. 4th International Colloquium on Numerical Analysis, Plovdiv University, Bulgaria, August 13-17, 1995.

- E. M. Laws and ***M. Aichouni***, ' The development of fully development turbulent pipe flow - An analytical and experimental study of the entrance region'. The Eighth Symposium on Turbulent Shear Flows. Munich, Germany. September, 9-11, 1991.

Post-Graduate Theses Supervised by Dr Mohamed AICHOUNI

Laribi Boualem, 'Experimental and computational study of the flow development through metering and flow conditioning devices', **PhD Thesis,** Prepared under a Joint Research Program between the University of Blida (Algeria) and The Catholic University of Louvaine (Belgium). Submitted at the Mechanical Engineering Department, University of Blida, Algeria, Jan 2004.

Abstract

Accuracy and precision of flow meters are among the most important metrological parameters in most industries dealing with icreasingly expensive fluids. The accuracy of these devices depends not only on their construction and method of operation but also on their position in pipe network. Pipe fitings such as valves, bends and other fixtures generate turbulence and swil and distort the flow distribution in the pipe. The present work is concerned with an experimental and a computational investigations on:

- The decay process of highly swirling flow (generated by a 90° out of planes double bend) in a circular pipe;
- The effect of the swirling flow on an orifice flow meter accuracy;
- The efficiency of three flow conditioners to romove the flow distortion and to improve the meter accuarcy.

Laser Doppler Anemometry and **Computational fluid Dynamics** techniques have been used to carry on the investigation.

Benchicou Soraya, 'Computational study of flow development downstream industrial flow conditioners'**. MSc Thesis,** University of Mostaganem, Algeria, 2003.

Abstract

Accurate and precise flow rate measurements are essential parameters from a technological and economical stand points at most of industries dealing with increasingly expensive fluids; According to the international standards ISO, AGA and ASME, accurate flow metering is obtained when the measuring instrument, called flow meter, is operating under fully developed flow condition; It is well known that this condition requires sufficient straight piping length or the inclusion of a flow conditioner. The aim of the present work is to carry on a numerical investigation uing CFD approach on the flow development downstream a selection of flow conditioners such as those described in the standards (ISO, ASME, AGA). The effeciency of three flow conditioners, namely the Etoile, the Tube bundle and the Laws plate conditioners to remove flow distortions and to produce the fully developed condition is investigated. The results show that better performances can be obtained by the Laws plate.

Cherigui Mohamed, 'Experimental study of the installation effects on orifice flow meters'**, MSc Thesis**, University of Mostaganem, Algeria, 2003 .

Abstract

The present work concerns the study of the installation effects of orifice flow meters; The effect of disturbed flow conditions and internal geometrical irregularities on the flow meter accuracy were studied experimentally. The results obtained during the study show that the non standards flow

conditions cause measuring errors which exceed largely the tolerated errors by the standards. Flow conditioners such as the Laws and the CPACL plates were shown to reduce the metering error to significant levels.

Karachira Fouad, 'A contribution towards the study of an industrial flow metering installation (GL4Z-Arzew)**', MSc thesis,** University of Mostaganem, Algeria, 2003.

Messoul AbdelRahmane, 'Numerical investigation of turbulent flows through smooth an rough circular pipes' **MSc Thesis**, University of Chlef, Algeria, 2000.

Abstract

The sensitivity of industrial flow meters to their operational conditions continues to limite their pecision and their accuarcy. According to the international standards ISO 5167, an acceptable flow condition requires sufficient straight and smooth piping length. The aim of the present work is to carry on a numerical investigation on the turbulent flow development in a circular pipe. Particualr attention is made to study the effect of internal pipe state on the flow development and the attainment of the fully developped condition.

Mous Mustapha, 'Experimental and numerical study of the installation effects upon Venturi flow meters', **MSc Thesis**, University of Mostaganem, Algeria, 1998.