

Department of Systems Engineering and Engineering Management

Seminar Series

On the role of vibration in sensing leaks in water distribution pipes

Prof. M J Brennan

Departamento de Engenharia Mecânica, Brazil

Date	30 September 2014 (Tuesday)
Time	5:00pm (Tea/Coffee service at 4:45pm)
Venue	Room 9210, 9/F, AC3

Abstract

Leaks have been detected and localised in water distribution in many countries for many years, by using the cross-correlation of pipe vibration measured either side of a suspected leak. However, in modern plastic pipes this is problematic because of the strong coupling between the water and the pipe which results in significant attenuation of the coupled fluid-pipe wave which is responsible for the propagation of leak noise. Hence leak noise does not propagate as far as it did in older metallic pipes. Another issue with modern correlators is that they require a relatively skill level to use them. Water companies, however, would prefer to rely less on the skill of the operator and to build more intelligence into the devices. In this presentation these key issues will be discussed. It will be shown that by having a detailed understanding of the physics of the problem, and connecting this with signal processing, it is possible to make significant improvements in the process of leak detection using correlators.

About the Speaker

Michael Brennan graduated from the Open University in 1987 while he was serving in the Royal Navy. He received an MSc in Sound and Vibration Studies (1992) and a PhD in the active control of vibration (1995), both from the University of Southampton, United Kingdom. He has been a Research Professor in the Department of Mechanical Engineering, UNESP, Brazil since 2010. Prior to this, he was Professor of Engineering Dynamics and Chairman of the

Dynamics Research Group in the Institute of Sound and Vibration Research (ISVR) at the University of Southampton (1995-2010). He is a past President of the European Association of Structural Dynamics (2005-2008), and a past Associate Editor of the Transactions of the ASME Journal of Vibration and Acoustics (2007-2013). He is currently a Guest Professor at Harbin Engineering University in China and Visiting Professor at the ISVR, University of Southampton. He has a wide-range of research interests, encompassing vibration, acoustics, vibroacoustics and rotor dynamics.

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All are Welcome!

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