



Canadian Nuclear Society / Société Nucléaire Canadienne

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Flow Induced Vibration in Two Phase Flows, Some Interesting Phenomena

The Chalk River Branch of the Canadian Nuclear Society is pleased to welcome Dr. Michel Pettigrew at its upcoming seminar. Dr. Pettigrew obtained a Mechanical Engineering Degree from École Polytechnique, Montréal, an M.Sc. from the University of Birmingham, England, under an Athlone Fellowship, and is a Fellow of the American Society of Mechanical Engineers (ASME). He was Principal Research Engineer and Technical Director of the Vibration and Tribology Unit at the Chalk River Laboratories of Atomic Energy of Canada until mid-2000. He is currently a Professor of Mechanical Engineering at École Polytechnique and BWC/AECL/NSERC Chair of Fluid-Structure Interaction at École Polytechnique. He holds five patents, is the author of some 300 publications and technical reports and has received several distinguished awards such as: the CNS W. B. Lewis Medal, the R&D 100 Award, the Professional Engineers of Ontario Engineering Medal, the ASME PVP Medal and two ASME Best Paper Awards.

Dr. Pettigrew will speak on recent research into two-phase flow induced vibrations, particularly in respect to CANDU piping systems and steam generators. So far relatively little work has been done on two-phase flow-induced vibration probably because it is difficult to do. Two-phase flows are not homogeneous and are governed by an additional parameter called void fraction. This can lead to different flow patterns or regimes that can change completely the vibration behaviour. A study of flow-induced vibration of piping elements in two-phase flow revealed an unexpected resonance phenomenon related to the flow velocity. The vibration excitation mechanism is believed to be momentum flux fluctuations.

Fibre optic probes were developed to measure the characteristics of two-phase flows. These probes are used to take detailed measurements in a triangular array of cylinders in cross flow. Initial results show that the flow tends to stream between the cylinders.

These studies have yielded interesting results but have raised more questions. The more puzzling results will be discussed in this presentation. Some of the dynamic phenomena will be illustrated by animation.



Dr. Michel Pettigrew
Professor of Mechanical Engineering,
École Polytechnique
& ASME Fellow

7:30 PM
Thursday, January 29, 2009

Bennett / Mackenzie Room, J.L. Gray Centre
(Entry via rear security entrance)

Refreshments will be served – ALL ARE WELCOME

Further information: Ragnar Dworschak at 584-8811 Ext. 44342, or Geoff Edwards at Ext. 43247