DEPARTMENT OF CIVIL ENGINEERING AND GEOLOGICAL SCIENCES

Fall 2010 Seminar Series

CHALLENGES AND INNOVATION IN CIVIL AND ENVIRONMENTAL ENGINEERING

Engineering in 2030: How the Engineering Profession is Changing

Jorg Imberger, NAE Foreign Associate

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Director, Centre for Water Research, University of Western Australia

Thursday, September 23, 2010
138 DeBartolo Hall, 3:30pm

Technology is changing at an increasing rate, as are pressures for greater infrastructure. These two factors will combine with the increased stress from climate change, increased people movements and disease vectoring. In technology the two most noticeable changes will firstly be a complete conversion to adaptive management using real-time management systems. I will describe via example how such systems allow designs that can adapt through active real-time control. Secondly, the development of nano-technologies will allow much closer control strategies, hence, even if the population increases as predicted, engineers will be able to re-engineer the energy, water and agricultural systems to provide the necessary demand. The issues that will, however, not be amenable to solutions are the increasing loss of living space, loss of cultural diversity, loss of life's guiding icons and loss of biodiversity and the stress that this causes. Initial evidence already suggests that these losses are leading to an increase in stress levels among people that, in turn, is leading to changes in our genetic expression and resulting in further stressful behaviour. This positive feedback is where the future engineer will be faced with the biggest challenge.

Dr. Imberger was primarily responsible for establishing the field of physical limnology. His research interests span the globe and include the motion and mixing in lakes, estuaries and coastal seas in response to both natural forces such as tides, meteorological surface fluxes, river inflows as well as effluent buoyant jets, bubble plumes and mechanical mixers. He is also active investigating the dependence of aquatic ecological systems on transport and mixing processes. He has a prolific research record and has published four books, 19 contributions to books, over 200 peer reviewed journal articles, 97 conference papers, over 130 technical reports and more than 90 plenary or keynote presentations. His most lasting legacy is perhaps his commitment to early career researchers, having supervised over 70 PhD students. Dr. Imberger maintains a passion for social justice and environmental sustainability.

A reception and an opportunity to meet the speaker will take place at 3:00pm in Fitzpatrick 156