

## **2003 Innovative Achievement Award – Dr. Esam Hussein**

Professor Esam Hussein is awarded the Innovative Achievement Award for his pioneering work on the neutron scatterometer developed for measuring transient void in a heated CANDU fuel channel.

A direct measurement of voiding rate in a CANDU representative channel is very important for addressing a regulatory issue related to behaviour under loss-of-coolant-accident conditions. However, the measurement is exceedingly difficult: conventional means such as gamma attenuation in the fluid do not give sufficient resolution, and secondly, the transient is very short (about 1 s). An accurate, fast-response instrument had eluded the CANDU industry for over a decade. Dr. Hussein conceived and pursued the idea of using neutron scattering, and despite numerous difficulties and setbacks, moved the idea from the concept to bench-scale demonstration stage. This was subsequently developed into a full-scale device by AECL and used successfully in the RD-14M facility.

Dr. Esam Hussein is a professor of Mechanical Engineering and Co-ordinator of the Laboratory for Threat-Material Detection at the University of New Brunswick (UNB). He has Ph.D. in nuclear engineering from McMaster University and received his M.Sc.E and B.Sc.E in nuclear engineering from the University of Alexandria. Prior to joining UNB, Dr. Hussein worked as a nuclear design engineer at Ontario Hydro. He is also an active member of the Canadian Nuclear Society.