

**MECHANICAL ENGINEERING DEPARTMENT
ME/ISyE 8773-8774**

**Industrial R&D: Pushing the Limits of Vacuum Interrupter Performance
While Living With Uncertainty and Time Pressure**

by

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Wednesday, February 20, 2008

3:15 p.m. — Refreshments before the seminar

3:30 p.m. — Graduate Seminar

Room 1130 ME

ABSTRACT — After failing to certify his vacuum circuit breaker using our newly designed high- voltage, high-current, vacuum interrupter and spending a great deal of money in the process, we had a very unhappy customer. He understandably placed a great deal of pressure on my R&D team to come up with a “successful” design within a limited time. This lecture will discuss the requirements for a successful vacuum interrupter in a vacuum circuit breaker mechanism. It will then briefly present our analysis of the failure and the thinking that went into the failed vacuum interrupter design. This design we knew was pushing the limits of performance, but our initial testing showed that it had a reasonable probability of passing the certification tests. Following this I will develop the process we went through using our knowledge of the vacuum arc and vacuum interrupter design to develop a new generation of vacuum interrupter that would have a higher probability of successfully passing the certification tests. I will show how this new design was evaluated and will conclude with what happened when the customer went back to the certification laboratory.

BIO — **Dr. Paul G. Slade** is Consultant in the areas of Circuit Interruption and Electrical Contacts. He retired in 2007 from Eaton Corporation where he was Director of Vacuum Interrupter Research, Development & Design. Before that position he held various management positions at Westinghouse Electric Corp. culminating in the position of Chief Scientist for the Industrial Group. He received his PhD from the University of Wales and an MBA from the University of Pittsburgh. He has been the director and lecturer of an “Intensive Course on Vacuum Interrupter Design and Application” presented to over 1000 engineers worldwide, as well as the director and lecturer of the “IEEE Intensive Course on Electrical Contacts.” He has over 100 published technical papers and 23 Patents. He is author of two books: “Electrical Contacts: Principles and Applications” and “The Vacuum Interrupter: Theory, Design and Application.” He has served as the representative and chairman of the Advisory Group to the International Conference on Electrical Contacts. He is a Fellow of the IEEE, and has received the IEEE Ragnar Holm Scientific Achievement Award.

Informal Faculty Luncheon: Wednesday, February 20, 2008, 12:00 noon. Meet in 1100 ME and walk to lunch with other faculty. Dr. Paul Slade will be able to attend.