

## Department of Mechanical Engineering

### Seminar Series

# Design of an Accident Prevention System for Light Water Reactors Using the Artificial Neural Network and a Highspeed Simulator

**Dr. Li-Chi Cliff Po**

President of Micro-Simulation Technology

Date	27 February, 2019 (Wednesday)
Time	11:00am – 12:00noon
Venue	B6605 (CSE Conference Room), 6/F, Yeung Kin Man Academic Building

### **Abstract**

Seven years after Fukushima, the last missing pieces of the jigsaw puzzle of light water reactor (LWR) safety have been put together. In the United States, the nuclear power industry has implemented a diverse and flexible strategy, FLEX (NEI 2012), for severe accidents. In this paper the author demonstrates that for LWRs, these methodologies can be configured into an online accident prevention system. Alterations of fission dynamics in LWRs due to mechanical failure, external event, or human error progress significantly slower than in other branches of technology such as chemical explosions or transportation accidents. The system makes rapid predictions using a high-speed simulation code and artificial intelligence (AI) diagnostics. Alternative routes are then proposed to the control room operators. Implementation of this system allows for prevention of core degradation and release of radiation into the environment.

## About the Speaker

- Founder president of Micro-Simulation Technology since 1985. Has developed PC-Windows based nuclear power plant simulator PCTRAN.
- Lecturer Director of IAEA annual NPP Simulation workshop since 1996. The course material and simulator CD was distributed to all member states.
- Internationally recognized in power plant thermal-hydraulics, safety and risk analysis, severe accident simulation and licensing activities.
- Has provided consultation in safety analysis and risk assessment to USNRC, Japanese JAEA, Swiss HSK, Taiwanese AEC, Finnish TVO, Egyptian NPPA, Mexican ININ, South African AEC, Pakistan NRA, Indonesian BATAN.
- Proficient in risk assessment methodologies, transient analysis codes RETRAN, RELAP5, MAAP4, GOTHIC and radiation transport codes ANISN, DOT and MORSE.
- Familiar with current risk-informed performance-based licensing process, post-TMI lesson learned, severe accident management, alternate source terms, emergency preparedness, etc.

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***All are Welcome!***