

# 第九届化工学院国际交流月系列讲座

## Prof. Jean-Pierre Signoret

### Total



Prof. Jean-Pierre SIGNORET received his MSc in Physics and Electronics, Electrotechnics, and Automatics in 1971. He worked in French Atomic Energy Commission, as a reliability engineer (1971-1981). After that, he went to ELF then TOTAL, as a reliability expert (1981-2008). Then he served as a development manager and gas/electricity division representative in southeast Asia in TotalFinaElf (1976 to date). He was also the previous vice chairman of ISDF, previous chairman of ESRA Committee member of ISO 14224, ISO20815, IEC 61508, and IEC 65511. Over decades of years, he has given lots of courses around the world.

## Safety and Dependability: Modeling and Probabilistic Calculations Overview

Since he appears on Earth the survival of the human being has depended on his capacity to design safe and reliable tools. In the modern ages this has been achieved through deterministic rule and regulations generally developed by authorities after that serious accidents have occurred. Nevertheless for high risk activity this has shown to be not sufficient as accidents have continued to occur from times to times. Therefore in the last fifty years a corpus new analysis and calculation method has been developed to complement the deterministic approach in order to prevent accidents before they even have been observed. These new methods are based on a probabilistic approach and gathered under the umbrella term *dependability*: ability, for a system, to perform as and when required. This covers both the safety and economical aspects even if the term *dependability* is often used only for the first aspect. The aim of this seminar is to give an overview of the main modeling and calculating techniques belonging to the dependability field. After general considerations about accidents and risk, the seminar presents the main qualitative approaches, provides the main definitions and describe quickly the main static and dynamic quantitative approaches (Markov process, fault trees, Petri nets, and Monte Carlo simulation). Finally some conclusions are proposed.

**Lecture 3: May 11<sup>th</sup> 3:00 -5:00 pm; Lecture 4: May 14<sup>th</sup> 10:00 am -12:00 pm**  
**Building 4 – Room 301**



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