Two-Day Course on Consequence Analysis & Inherently Safer Design

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Dr. Mannan addressing attentive participants during a subject on Human Error.

A total of 23 participants gathered at the Singapore Polytechnic Graduates Guild on the 6th & 7th of December 2010 to learn from Regents Professor, Dr. Sam Mannan of Texas A&M University.

Professor Mannan was awarded the status of a Regents Professor and the title of T. Michael O'Connor Chair I for his contribution towards process safety.

This two-day course was specially put together for SLP by Professor Mannan during his entourage to Asia. SLP is indeed honored and privileged to have Professor Mannan during his short stay in Singapore.

The first day covered the fundamentals of consequence analysis, a tool that all learned to use it more meaningfully during the design phase and emergency planning stage of any process plant. Otherwise, it may then be used more critically during the post-incident investigation phase; to verify or validate evidence and findings.

Professor Mannan's personal account as an independent reviewer of UK's Buncefield Tankfarm Fire was both insightful and complementing when dealing with the subject of consequence analysis. His personal experience of how consequence modeling tools are used during design and planning stages of a plant's life cycle vis-a-vis post-incident investigation was a key takeaway by all.

Many would go away with the vividly memory of the Buncefield field test experiment results Professor Mannan shared during his case study sharing on vapor cloud deflagration and detonation.

Key contents of consequence analysis covered were methods for evaluating the consequences of flammable and toxic vapor cloud dispersion, vapor cloud explosions, confined explosions, pool fires, flare and torch fires, and Boiling Liquid Expanding Vapor Explosion (BLEVE). Theoretical research and experimental data were presented to support the choice of models for specific applications. Examples of actual accidents were illustrated and validated with the models used.

The second day of the course focused on the basics of inherently safer design; covering the elimination of hazards from manufacturing processes, rather than the management and control of those hazards. This second part of the course introduced the concepts of inherently safer process design and discussed implementation of these concepts throughout the process life cycle from early research through an operating plant.

Tools for designing inherently safer processes were discussed, as well as tools for measuring inherent safety. Many practical examples from industry will be highlighted; covering topics such as Hazard Identification, Risk Assessment, Layers of Protection, and Traditional Risk Reduction versus Inherent Safety; giving the participants a holistic view of how inherent safer design can benefit the petrochemical operations and the processing facilities throughout the plant's life cycle.

Nonetheless, at the back of our mind when we part, we hope that the dedication, commitments & investments ploughed into process safety, be it through inherently greener & safer designs or consequence modeling; Process Safety remains our utmost concern.

Written by Ivan Sin

Participants working hard during the breakout session.

Mr Solomon Lee received his certificate from Dr Mannan after the 2-day session.