## **Process Safety Performance Indicators (Metrics)**

On March 23rd, 2005, an accident at BP's Texas City refinery resulted in 15 fatalities and 170 injuries. This accident became a watershed process safety event that triggered many process safety management (PSM) initiatives. One such initiative was the recommendation of process safety performance indicators for the chemical process industry. This was recommended by the BP Refineries Independent Safety Review Panel (Baker Panel) and also the U.S. Chemical Safety Board (CSB).

To help better understand the latest recommendations and for best practice sharing, SLP and SCIC (Singapore Chemical industry Council) jointly organized a talk on "Process Safety Performance Indicators (Metrics)" by Mr. Mitch Krutilek, Manager of Process Safety Management in Chevron Phillips Chemicals Company in Texas. This talk was held on November 20th, 2007, at the EDB Academy in Jalan Bukit Merah. 40 SLP and SCIC members and guests attended.

In his presentation, Mr. Krutilek stressed that the primary objective of Process Safety Management (PSM) is "to use metrics to measure and track the effectiveness of the process safety management system to prevent the release of hazardous, toxic and flammable materials, and hence preventing catastrophic accidents". These performance indicators should be used to drive changes in human behaviour and in the safety system, to reduce risk and have fewer accidents. Indeed, he stressed that continuous improvement in the process safety system has been the emphasis of Chevron Phillips Chemical. He spoke about the company's proactive approach to the adoption of the "right" metrics and their use to manage process safety. These metrics serve to indicate the state of health of important aspects of the process safety management system. If measured and monitored, he said that these metrics would indicate early deterioration in the effectiveness of these key safety systems. Hence timely remedial actions can then be taken to avoid a serious process safety incident.



Terrence Koh, SCIC's Director showing his appreciation on behalf of the audience

He went on to elaborate why and how the following indicators were adopted for his company.

## A. Lagging indicators

- Number of process safety incidents
- Process Safety Severity Index (ACC metric)
- Precursors (Leading or Lagging)
- Challenges to safety systems

## **B.** Leading indicators

- Number of preventive maintenance or inspections past due
- Number of mechanical integrity corrective recommendations past due
- Number of maintenance procedure reviews past due
- Number of PSM related action items past due by year
- Number of permanent Management of Change past due by year
- Number of temporary Management of Change past terminal date by year
- Number of open, cancelled, and closed Management of Change's by year
- Number of contractor monitoring past due
- Number of PSM training courses past due

This interesting and informative presentation was followed by a lively discussion during the tea session that followed.

The Director of SCIC, Mr. Terrence Koh ended the proceedings by thanking Mr. Krutilek for his valuable insights and presenting a memento to him.

## By Tay Cheng Pheng



Mitch taking a question from the audience