SLP Society of Loss Prevention Update
In the Process Industries
AUG 2012

# President's Message

Dear Fellow SLP Members,

I am very delighted to inform you that SLP has continued to be very active in organizing activities and events for our members as we rolled into 2012.

The Executive Committee has conducted several impactful training courses, technical talks as well as Process Safety Forums and dialogue sessions with the Ministry of Manpower (MOM).

We will continue to bring together subject matter experts from the process industries to share process safety management practices and create networking opportunities for the members. We will explore new partnership and collaboration opportunities, build friendly relationships with other professional institutions and relevant government authorities to enhance and strengthen our position.

I would also like to take this opportunity to thank the members of the various working groups who have sacrificed their family and personal time contributing to the works of SLP.

1. Networking and Collaboration subcommittee - Chaired by CS Teng
2. Technical program and Activities subcommittee - Chaired by Ivan Sin
3. Communication and Publicity subcommittee - Chaired by Prof Reginald Tan

I look forward to your continued participation and support in SLP.

# MEMBERSHIP
## Referral Incentive Scheme

SLP is introducing a membership referral incentive scheme for all members. The intent is to engage all members to actively contribute to the recruitment of new members. We believe that our members are in the best position to recommend new members to join SLP.

The incentive scheme is open to all ordinary members. Members who have referred a successful new member will receive a rebate of S$80.00 which is equivalent to one year's membership fee. The period for incentive scheme will run from 1st Jun 2012 to 31st May 2013. SLP reserves the right to amend, terminate or extend this incentive scheme at any time as it appropriate.

The membership referral incentive scheme is guided by the following terms and conditions:

- The rebate of S$80.00 will be effective for the following fiscal year.
- No carry forward of rebate is allowed which means that the rebate must be "consumed" in the following fiscal year.
- No "multiplier" effect on the rebate for successful referrals which means that the member shall receive only one rebate of S$80.00 even if he or she is successful in referring more than one new member.

We will acknowledge all members who have successfully referred new members to SLP in our website.

We look forward to your enthusiastic support of this incentive scheme. Let us all work together to increase our membership. This will expand our talent pool to serve you and our community better.

# Editor's Note

Welcome to 2012's SLP e-newsletter. We hope you continue to find the e-newsletter informative and interesting.

If you have any articles, news, ideas, experience, feedback or stories related to process safety that you wish to share, do write to us at: secretariat@slp.org.sg

If your email address is going to change and you would like to continue to receive this e-newsletter, please also contact us to update your contact information.

# SLP's Book Prize

## - An Appreciation Note from Temasek Polytechnic

**Temasek Polytechnic's Diploma in Chemical Engineering aims to prepare students for work in the chemical industry. Often we are reminded through reported industrial accidents of how paramount SHE (safety, health & environment) is to the chemical industry; lapses in any of the SHE elements can lead to losses and disruptions.**

The course has a comprehensive range of safety programmes where we aim to inculcate good SHE knowledge and practices to our students. Occupational Safety & Health (OSH, ACE2009), a 60-hour subject is taught in the students' 2nd year of studies. This subject aims to impart to the students the awareness of the various dangers that exists in the workplace and methods of protection against such dangers. Such knowledge will equip the students with the necessary knowledge to enable them to work in a safe and efficient manner in their future workplaces. OSH also aims to give students the understanding of the many issues concerning occupational health. It provides the students with the knowledge of the various terms commonly used in occupational health (PEL, LD50, PET, etc.) and various occupational diseases with regard to the recognition, evaluation and control of hazards. Hands-on experience with necessary tools such as gas meter, heat-stress index monitoring equipment, noise meter, etc. are provided to ensure a students' achieved a holistic education. Topics taught in OSH include: Machine Hazards & Safety; Electrical Hazards; Fires/Explosions; Housekeeping and Material Handling/Labelling; PPE; Work Permit System/Confined Space; Heat Stress; Ventilation; Noise; Industrial Lighting.

Plant Safety & Loss Prevention (PSLP, ACE3004) is a 60-hour subject. It provides a deeper understanding of principles and knowledge of process safety and loss prevention in the industrial setting. Advanced safety matters such as safety management system, hazard identification, risk assessment, risk management, hazard analysis, safety audit, etc. are taught. Students are also taught the important legislations (Workplace Safety & Health Act, Workmen Injury & Compensation Act, etc.) that govern the workplace safety. Topics taught in PSLP include: Safety Programs & Accident/Loss Statistics; Hazard Identification and Risk Assessment in Industries; Plant Safety & Loss Prevention Management; Accident Investigation and Safety Legislation.

Complementing these safety modules, the students also attended a course-level Safety Seminar. Speakers from the industries (SLP, MOM, PCS; Chevron, etc.) are invited to share the safety practices in their respective companies/industries as well as the latest development in the field of SHE.

Our students progressed on to apply their SHE knowledge when they enrolled for their 16-week industry attachment in their final year of studies. Starting in the Chemical Process Training Centre (CPTC) in Jurong Island where the students learn to operate chemical plant in a safe manner, some of the students moved on to assist their company on safety matter.

The SLP Book Prize is awarded to the overall top performing student for the subject of OSH (ACE2009) and PSLP (ACE3004). In Graduation 2010, Debbie Teo Jia Ling was the recipient of inaugural SLP Book Prize. We are thankful for SLP's support and hope that the award will encourage all our students to uphold the SHE values when they enter the workforce.

*Anthony*

# ONE-DAY Training Course on Design of Pressure Relief & Flare Systems

Pressure relief and flare systems are common sights in our daily operating domain if you are working in the process industry. Many would have taken these systems for granted that they would be designed to handle all process deviations or upsets when required; but are they the final catch-all solution?

Being a process safety specialist, EHS personnel, process engineer, or technical manager, many of us would have at one point in time asked questions like:

1. How do the pressure relief and flare systems fit into our layer of protection analysis?

2. What are the possible consequences if these systems are poorly designed or maintained? How these consequences affect process hazard analysis? What if the open bonnet vent of a bellow or balanced piston valve is plugged by mistake or insects?

3. What were the considerations when the systems were designed? Can they still handle the plant's current risk levels and contingencies?

*Mr Leslie Tsen from MSD sharing his comments during the training session.*

*Mr Ivan Sin introducing the speakers Mr Chan Keng Yong and Mr Amit Shah from Siemens to the participants.*

On 16 March 2012, twenty-two SLP member-participants gathered at the Singapore Polytechnic Graduates Guild to understand the design considerations of pressure relief and flare system conducted by Siemens Oil & Gas Division.

The 1-day training reviewed the essential process and safety design requirements for pressure relief and flare disposal system. The topics covered include:

- Approach to Pressure Relief System Design;
- Consequences of Improper Design of Pressure Relief & Flare System;
- Overpressure Scenarios & Required Relief Rates;
- Relief Device Sizing;
- Relief Disposal System Design;
- Identification of Global Scenario; and
- Network Equipment Rating for Radiation & Knockout Drum Sizing.

Emphasis was placed on overpressure scenarios identification, required relief load calculation methodologies, relief device capacity calculations, global scenario identification, and flare disposal system design.

During the class, requirements of ASME code and API recommended practices were presented and discussed; along with analysis of common processes to determine relief requirements.

The concepts and best practices of "Ever-greening" was also outlined; enabling company to develop a consistent and standardized pressure relief and flare design philosophy and engineering analysis to promote ever-greening of pressure relief and flare system for the safe operation throughout the entire facility life cycle, coupled with conscientious documentation of the management-of-change process.

This training session provided a good opportunity to exchange knowledge and sharing of experience; enhancing the techniques and methodology in implementing Process Safety Management.

*Written by Ivan Sin*

# TECHNICAL TALK

# Overfilling and the associated PSM Elements

**The SLP invited Mr. John Lockwood, Senior Risk Consultant with GL Noble Denton, USA to give a technical talk on the topic "Overfilling and the associated PSM Elements".**

**Mr. Lockwood who is currently based in the United States was a Founder Member and Fellow of SLP. He was in Singapore to carry out a safety audit and also to catch up with some old friends.**

**The event was held on 24 Jan 2012 at the Jurong Country Club. It was well attended by 35 corporate and ordinary members from the oil, petrochemical, pharmaceutical industries, etc.**

*Mr. Lockwood delivered his talk to a packed audience at Jurong Country Club.*

The talk highlighted the likely equipment involved in overfilling. He cited Buncefield, Texas City and Thai Oil Refinery incidents to illustrate how the overfilling would occur. The lessons learnt and specific message in his talk focused on ensuring the continuing integrity of overfill protection. This includes

- Calculation to estimate when a vessel is full
- Automatic gauging systems
- Independent high, high level alarms
- Independent emergency shutdown devices to close inlet valves and to stop pumps
- Constant monitoring of vessel levels and level trends.

Towards the end of his talk, he touched on how some key PSM Elements (PHA, Mechanical Integrity, Operating Procedures, Training, Management of Change and PSSR) and the independent layers of protection could reduce the risks of overfilling.

The enthusiastic response from the attendees during the Q&A session indicated that it was an activity worth repeating.

All attendees were treated to a lovely buffet spread dinner after the talk. The relaxed atmosphere provided a great opportunity for follow up discussion on the topic of the night and networking.

*Written by: Jacob Soh*

*Picture on the left:*
*Section of the audience listened attentively to Mr. Lockwood.*

*Picture on the right:*
*Mr. CP Tay presented Mr. Lockwood with a token of appreciation.*

# Two-Day Course on Managing Risks associated with Plant Operations and Maintenance in the Process Industries

Disastrous consequences have resulted from failure to manage the risks associated with plant operations and maintenance in the process industries. Responsible organizations need to safeguard their personnel, protect the environment and maintain their assets by adopting industry best practices. Anything less is undesirable. Many lessons can be learnt from catastrophic incidents that happened. Or have we really learnt?

The SLP organized the 2-day training course "Managing Risks Associated with Plant Operations and Maintenance in the Process Industries" on 4 and 5 January 2012 at the Singapore Polytechnic Graduates Guild to highlight the importance of managing these risks.

Dr. Sam Mannan, current Regents Professor in the Chemical Engineering Department at Texas A&M University and Director of the Mary Kay O'Connor Process Safety Center at the Texas Engineering Experiment Station shared his thoughts, practical experiences, insights, and views on the challenges face in these operations and maintenance activities. He is the co-author of the "Guidelines for Safe Process Operations and Maintenance" published by the Center for Chemical Process Safety, American Institute of Chemical Engineers.

**During training course, wide-ranging topics were covered:**

- Process Safety Management overview;
- Role of Operations and Maintenance in Process Safety Management;
- Overview of hazard identification techniques;
- Plant life-cycle and hazard identification;
- Process safety and plant design;
- Designing for inherent safety;
- Controlling of hazards to reduce risks;
- Process safety during plant construction;
- Process safety during pre-startup and plant commissioning activities;
- Process safety during plant startup;
- Managing the risks associated with operations and maintenace activities;
- Routine/ Non-routine operations;
- Management of change;
- Incident investigation;
- Lessons learned communication;
- Plant shutdown and decommissioning activities;
- Plant shutdown and decommissioning activities; and
- Incident example

Twenty-four EHS professionals from chemicals, pharmaceuticals and oil and gas industries participated in the training course. They brought diversified viewpoints, experiences and perspectives to the classroom. There were great opportunities to network during the tea and lunch breaks.

The course was structured in a way that allowed participants to walk through the issues, starting from the risks that have to be addressed during typical operations and maintenance as well as shutdown and startup activities.

Case studies and unpublicized videos with Dr. Mannan's involvement in the Challenger space shuttle accident investigation got the attention of participants. Most participants were interested to conduct case studies that were not available in the public domain.

SLP President CP Tay presented the Certificate of Completion to all the participants.

*Written by Jacob Soh*

*Dr. Sam Mannan concluded by sharing this food for thought:*

***"Be a leader, and do not assume others have already identified the hazards around you"***

*and*

***"Do not leave everything to the emergency response team"***


*Picture on top:*
*Prof Reginald Tan from NUS sharing a comment with the participants during the training session.*

*Picture on the right:*
*Participants from broad-ranging industries with Dr Sam Mannan.*