



Society of

Loss Prevention

In the Process Industries

news

MAY 2009

MITA NO.: MICA (P) 059/08/2008

TARGETING ZERO

This is the second in our series of Technical Talks on the sharing of Corporate Best Practices in the area of safety, industrial hygiene and environmental protection. This talk, held on January 16, 2009, was conducted by Ms Charleen Dickson, Vice President for Environment, Health and Safety for Chevron Phillips Chemical Company. It also marked the second time that SLP had partnered with the Singapore Chemical Industry Council (SCIC) on such an activity.

In her presentation, Ms Charleen Dickson, spoke about her company's determination to achieve ZERO loss. In this context, ZERO includes zero injuries, zero industrial hygiene incidents and zero environmental incidents. For Chevron, this target is applicable to employees and contractors. This is an extremely challenging goal and it has the support of Chevron's senior management. This is perhaps the most important lesson. Companies that have exemplary performance in EHS all share this characteristic – their senior managements take EHS performance very seriously.

One could say that these strategies are not new and they are not. The secret of success is in how rigorously they are applied. Thus, we would go right back to where we started — the crucial role that senior management plays in determining the EHS performance of any organization.

A testimony to the importance of the subject



What are the strategies to achieve this goal?

- 1. Best Practices Teams** – Teams have been formed to review industry best practices and to develop companywide EHS procedures. The point to note here is that there is no lack of knowledge to promote exemplary performance. Company wide standardization and sustained application is the key.
- 2. Tenets of Operation** – This is Chevron's terminology for behavioral safety. Here good psychological principles are applied to the human side of injury and incident prevention strategies to reduce or eliminate injuries and illnesses. For example, workers are empowered to think and follow principles such as "Work Safely or Not At All" and "There is Always Time to Work Safely"
- 3. Operational Excellence Systems** – These management systems focus on continual improvement in specified areas in personnel and process safety, health, environment, security, quality and reliability. These OE Systems encompass the key core principles, metrics and verification. Compliance is ensured by regular audits.
- 4. EHScoms – Sharing of Lessons Learned** - All facilities are expected to proactively share their lessons on recordable injuries and process safety incidents.
- 5. Summer of Safety Campaigns** – This is an outgrowth of the observation that there are significantly more injuries and illness during hot summer months. This principle could be applied to situations where we can anticipate more risks at work eg. a turnaround or start-up. Promotional activities would include relevant safety talks eg. protection against heat stroke, poster competitions, more comprehensive involvement of workers in site inspections, emphasis on reports/observations of unsafe practices and so on.

Continue on Pg 3

President's Message



The recent fatal accidents, involving the handling of a hazardous chemical and another one involving the fall of a suspended load, that claimed a total of five lives within the first quarter of the year has sent a very stark reminder to everyone that such fatal accidents will happen if the safety risks associated with hazardous work are not properly addressed.

Are we really on the right track to be on par with world-class WSH performance? What is the real root of the problem? Risk assessment, management commitment, worker training and competency, safe work procedures, supervision, hazard communications, emergency response and personnel protection were the recommendations made by the Workplace Safety & Health Council in its recent WSH Bulletin – WHS Alert to address these accidents. Senior management and EHS professionals know very well that these are the basic elements of the EHS management system they should have put in place to prevent such accidents. The missing links that caused the system to break down are really what senior management and EHS professionals need to identify in order to reverse the trend of serious accidents.

- Risk Management is not really new to management, EHS professionals and managers/leaders in industry, especially our process industries. The question really is, how well safety risks in industry are being managed with **systems** that are **robust** enough to prevent such tragic accidents. Senior managers have the most critical role in this and they have to internalize this belief. The extent of their belief will be demonstrated in their day-to-day behavior and action.
- The whole incident triangle or iceberg must be managed, not just the most severe (headline grabbing) accidents. An over concentration on the peak of the triangle will risk overlooking the warning signals that are present nearer the base of the triangle. Just paying attention to severe accidents will lead to episodic or random improvements at best. The overall trend will be unchanged.
- The practice of using end-of-pipe performance indicators eg. reportable accident rates should be de-emphasized. A shift to upstream indicators, eg. % completion of corrective actions within recommended time frames, should become the norm. These upstream indicators are predictors of performance. A timely arrest of an unhealthy trend will lead to systemic improvements.
- Recognition and reward systems should be revised to give due recognition to WSH performance.
- To concentrate on observable behavior and making improvements in this area before embarking on building a nebulous safety culture. The pervasiveness and permanence of behavioral changes for the better will in the end build a robust safety culture.

The list goes on. The most important thing to note is that it all starts with senior management! There is no substitute for this.

Editorial

As our President has noted, 2009 has not begun very well for WSH performance for our country. As EHS professionals, it must concern us that Singapore as a whole has not shown a systemic performance improvement despite the many campaigns and exhortations from our country's political leaders. The knowledge and techniques are certainly present. Safety, just like quality, cannot improve by end-of-pipe inspections or measures. For a sustained and systemic improvement, we have to do what our Quality friends have done. We have to work at the root ie. upstream, long before non-conformances (incidents/accidents) occur. The most powerful ally in this work is the senior management of a company. The man or woman in charge of the performance of the whole company has to believe this and to demonstrate this, day in and day out, in his behavior and actions.

Your Executive Committee, as the leaders of SLP, has decided that SLP should take a more visible role in our EHS area of operations. Exco. members starting with our President has and are serving in various committees and work groups involved in making systemic improvements in EHS (usually referred to as safety) performance. For instance, we have an Exco. member in the SPRING committee on SS 506. There are others helping out with SCDF authorities in implementing an audit/assessment system for emergency preparedness. While it is important for our leaders to be active, it is just as important for our members to contribute their know-how whenever there is an opportunity. For example, if you are offered an opportunity to give a talk or to teach an EHS topic at the university or a polytechnic, you should welcome it. Our involvement with the EHS Master's program at NUS and our teaching of the Accident

Investigation topic at the SEI program on Management of Hazardous Substances is well established. Recently, we added Temasek Polytechnic to our list of partners. In this case we talked about Accident Investigation to the graduating class for the diploma in chemical engineering.

Your Exco. is going to take a more pro-active approach in our relationships with outside parties and regulatory authorities. Approaches will be made to MOM, NEA and SCDF, where we already have a relationship to strengthen and broaden it. We intend to write to bodies such as the Workplace Safety and Health Council (WSHC) to volunteer our help in the areas of our expertise. There will be many opportunities for SLP to help. Say yes when an opportunity is offered to you.

Members will remember that we were given a US \$ 2500 grant by Schering-Plough Singapore to promote EHS excellence. We have decided to use some of this award to recognize a final year student for the Diploma in Chemical Engineering at Temasek Polytechnic. This student has to demonstrate the best performance in the subject on Loss Prevention and for a final year project involving several elements in EHS. The first award will be given out in 2010.

We will be having our AGM at the end of June. Members will be receiving the official notices soon. Please mark your calendars and make it a point to come. Come and enjoy some quality time with your fellow EHS practitioners.

Happy Reading!

Concepts of Tenets of Operation: The Human Side of Injury and Incident Prevention



- ✓ Tenets are basic risk principles.
- ✓ Multiple violations will develop a "chain of errors."
- ✓ As the error chain grows, the probability of an event is increased.
- ✓ The greater the number of Tenets in violation at the time of an incident, the greater the consequences.
- ✓ Following Tenets is key to injury and incident prevention.



The Chemistry of Excellence Operating Hierarchy

Tenets of Operation

1. Never operate equipment outside of design or environmental limits.
2. Always move to a safe, controllable condition and seek assistance when a situation is not understood.
3. Always operate with safety and environmental protection devices enabled.
4. Always follow all safety/environmental work practices/procedures and act to stop unsafe conditions and actions.
5. Always produce a product that meets or exceeds your customer's requirement.
6. Never compromise or compromise a dedicated system.
7. Always report environmental/safety compliance information accurately and on time.
8. Always address abnormal conditions and clarify/understand procedures before proceeding.
9. Always develop and follow written procedures for high risk or unusual situations.
10. Always involve people with expertise and first hand knowledge in decisions, improvements and changes that affect procedures and equipment.

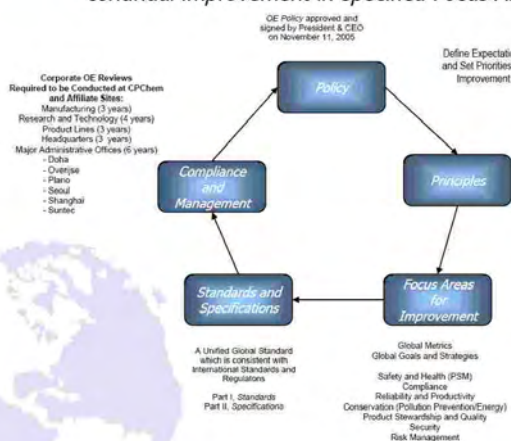
THE FOUNDATION OF SUCCESS!



Operational Excellence System...



Our Internal Management System for promoting continual improvement in specified Focus Areas



A lively discussion followed the presentation. Several speakers related their own experience on continually improving EHS performance. They endorsed the points made by Ms Dickson. These discussions continued into the tea break.

Ms Dickson truly earned her memento.

Reported by Tay Cheng Pheng



Ms Charleen Dickson receiving her well earned memento

Safety and Health Management System for the Oil and Petrochemical Industry

Reproduced below is an important message from the Commissioner for Workplace Safety and Health Division of the Ministry of Manpower.

Since 2001, oil refineries and petrochemical plants are mandated to implement safety and health management systems and have the systems audited once in every two years. The "Code of Practice on Safety Management System for the Chemical Industry" was established in January 2001 as a reference document for implementing and auditing of the safety and health management system for the oil and petrochemical industry.

With the launching of Singapore Standard SS 506:Part 3 "Occupational Safety and Health (OSH) Management System – Requirement for the Chemical Industry" in November 2006, the Ministry of Manpower (MOM) has withdrawn the earlier "Code of Practice on Safety Management System for the Chemical Industry".

Oil refineries and petrochemical plants should use SS 506:Part 3 "Occupational Safety and Health (OSH) Management System – Requirement for the Chemical Industry" as the reference document for auditing instead of MOM's "Code of Practice on Safety Management System for the Chemical Industry". We, however, noted that a number of companies in the oil and petrochemical industry are still using the withdrawn MOM's "Code of Practice on Safety Management System for the Chemical Industry" as a reference document for auditing.

We would like to advise oil refineries and petrochemical plants to use the Singapore Standard SS 506: Part 3 "Occupational Safety and Health (OSH) Management System – Requirement for the Chemical Industry" as a reference document during the audits. A grace period will be given to adjust to the change. All mandatory audits of the safety and health management systems in the oil and petrochemical industry conducted on or later than **1 July 2009** should be based on the Singapore Standard SS 506: Part 3 as a reference document.

Should you need any clarification, please contact Mr Dave Lir at Tel. 63171485 or at email address: dave_lir@mom.gov.sg.

Go Heng Huat

For Commissioner for
Workplace Safety and Health Division



Dr Angoh Gaetan, Managing Director, holding our "thank you" plaque with his happy visitors

Visit to Corporate Member Schering-Plough

As part of its regular technical program, a group of eager SLP members visited Schering-Plough on April 22. The visit began by first being briefed about Schering-Plough's operations.

Schering-Plough is a worldwide pharmaceutical company committed to discovering, developing and marketing new therapies and treatment programs that can improve people's health and extend lives. The company is a recognized leader in biotechnology, genomics and gene therapy. Core product groups are allergy and respiratory, anti-infective and anti-cancer, cardiovasculars and dermatologicals.

Schering-Plough Ltd., Singapore Branch was the first major US pharmaceutical company to establish manufacturing operations in Singapore in 1994. Since that time, its investment has grown to over US \$ 1 billion. It has 7 manufacturing plants here that make a diverse range of pharmaceuticals including active drug substances, tablets, dry powder inhalers, sterile injectables and nasal sprays.

The 13-person SHE Department is led by Managing Director, Dr Angoh Gaetan. Besides handling safety, health and environmental issues, the department also operates the

wastewater treatment plant, unloading of bulk chemicals and operating the thermal oxidizers.

Managing workplace hazard is one of the core responsibilities of the SHE Department. Since the implementation of Hazard Identification and Risk Assessment (HIRA) in 2005, up to 2200 workplace activities have been evaluated for their hazards, control measures and risk level. Besides HIRA, the site also has a change management process where process engineers take the lead to analyze changes to facilities, equipment or plant operations for any process hazard.

The site is certified in both ISO 14001 and OHSAS 18001 Management Systems. It has the honor to be the first pharmaceutical company in Singapore to obtain ISO 14001 certification in 2005. Besides the yearly surveillance audit conducted by the external registrar, the site has a pool of about 40 cross-functional trained Internal and Lead Auditors.

The site has a large-scale US\$16 million tri-generation facility. Tri-generation is the concept of deriving three different forms of energy, namely power generation, combined heating and cooling from a single primary energy source (natural gas). With the operation of the tri-

generation plant, energy consumption has fallen from 13.5MW to 10.5MW. Besides cost savings, the facility also brings substantial reduction in carbon dioxide gas emission, from 75 kilotons to 57 kilotons per year. This is equivalent to planting 15,000 trees with an average lifespan of 70 years.

SHE staff accompanied SLP members during the tour. This was much appreciated by the visitors because they could get first hand information on the spot. The interaction continued during the reception that followed. From the sound of things in the conference room, it was easy to conclude that both the hosts and the visitors had an enjoyable time

Ngiam Tong Yuen, on behalf of Ong See Hee, the President of SLP thanked Schering-Plough for its hospitality. To mark the occasion, a token of appreciation was presented to Dr Gaetan Angoh.

By Anthony Neo

Editor's Note:

SLP members are fortunate that our corporate members willingly share their SHE experience with us. This is one of the most important benefits of being an SLP member. We network and share our experience so that the overall SHE performance of our various industries and Singapore as a whole will improve. Schering-Plough is one of our staunch supporters. Last year, it awarded us a US \$ 2500 grant to propagate environmental protection and a safer workplace. Readers would be pleased to know that we are using part of the proceeds of this award to establish a prize for the best student in the area of Loss Prevention at Temasek Polytechnic. This student will be selected from the graduating class for the Diploma in Chemical Engineering.



A member of Schering-Plough's SHE Department explaining his plant's operations



Discussing operations in a reactor building



Dan receiving his well deserved memento

Corporate Best Practice Sharing with Chartered Semiconductor Manufacturing

This is another talk in our series on Corporate Best Practice Sharing. What is unique about this talk is that it was done by a person from the electronic wafer fab industry. The speaker was Dan Steele, Senior Director for Quality and Reliability Assurance, Corporate EHSS and Risk Management. He is an SLP member.


In this talk, Dan gave an overall view of Loss Control and Risk Management in the wafer fab industry. **'Risk Management is built into everything we do'** is the gist of the risk management philosophy at Chartered Semiconductor Manufacturing (CSM).

Risk Management Philosophy

Risk Management is built into everything we do.

"Risk management is inherent in our business. Thus, how we manage our risk is critical to our business growth strategy and protecting our reputation as a reliable supplier so as to enhance shareholder value. We also have a responsibility to ensure a safe workplace for our employees."

- Chartered Management




CSM was founded in 1987 in Singapore and is currently the third largest wafer fab manufacturer in the world. It operates 6 fab plants in Woodlands and Tampines, employing about 6000 employees. There are over 100 different chemicals being used at the plants, including toxics, solvents and other highly hazardous substances.

Risk Management (RM) is at the core of their management practices and this is supported by a strong EHS management system. These include 7 programs to assess risk for process equipment, new equipment installations, chemical exposure, electrical systems, live work (permit-to-work system), EHS aspects and impacts and new chemicals (selection/evaluation/control). There is also an in-house online risk assessment tool for use by the 'aspect owners'.


The output of the above RM work translates into physical controls that are put in place to protect manufacturing facilities and utilities under various scenarios that may disrupt plant operations. Strong

management commitment is demonstrated by the President and CEO of CSM who personally helms the EHS Program Management Committee. Senior management meets every 6 months to address key issues in regulatory compliance, customer-specific requirements in product quality, environment and corporate social responsibilities. Programs for business continuity planning, emergency response and other security threats are also in place to prevent disruption to any part of the business.


Emergency Response Training




Fire Fighting



First Aid



Hazmat Training



All Chartered fab plants are certified to ISO/TS16949, ISO14001, OHSAS18001 and for being ODS-free for all process chemicals. CSM has received a number of awards for Occupational Health Best Practices and ACCA Environmental Reporting. They have also received recognition from major customers including Sony, Ricoh and Sanyo. Dan was proud to say that **'We have not had a claim above or below the insurance deductible in 9 years'**!

Chartered's EHSS and Risk Management system complies with the elements of an OSHA Process Safety Management program, as are applicable to the wafer fab industry. Dan Steele ended the talk with these words of wisdom, **'Of course there is NO END. We are continuously improving!'**

On that note, our Hon Secretary thanked the speaker and presented him with a token from SLP. Further discussion among the speaker, members and guests continued during dinner following the talk.

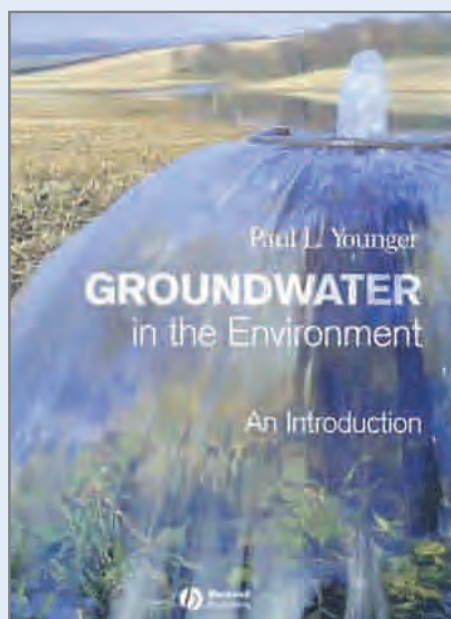
By Lam Kit Wing

BOOK REVIEW

Groundwater in the Environment: An Introduction

By Paul L. Younger (c) 2007

Blackwell Publishing



Al Gore, who stood for the position of the President of the United States lost the race for the White House but instead won both an Academy Award and the Nobel Prize for his contributions to our understanding and appreciation for the threat of Global Warming and its consequences on the environment. It would seem that the Inconvenient Truth was about Global Warming but to me (the reviewer) its most dire warning was not about the weather but about the supply of drinkable water. It is no surprise then that there is a resurgence of interest in groundwater and securing clean water supplies.

While many books on this subject are fairly difficult to read and contain too many mathematical equations and models, Paul Younger's "Groundwater in the Environment" is the exception. It proclaims in the preface that it is "Groundwater for beginners". It delivers the subject matter in an easy-to-read and well-phrased succinct manner. Unlike many other textbooks on the topic of groundwater, this one is less intimidating in that it makes terms and concepts for a non-hydro-geologist easy to comprehend.

Chapter 1 is Occurrence of Groundwater. Here the reader gets acquainted with terms like the water cycle, aquifers, aquitards and the like. This was accompanied by simple and instructive schematic diagrams.

Chapter 2 is Sources of Groundwater. Questions like "Where does groundwater come from? What is meant by recharge?" are posed and answered.

Groundwater Movement in Chapter 3 is a little dry but the author tries his best to keep things simple and interesting. Some of the concepts are explained in text boxes which offer a witty and whimsical insight into this very dry topic such as that with the heading in Box 3.2: "Life's a beach and then you dye: observing groundwater discharge geomorphology and flow processes at the seaside."

The topic of Groundwater Quality is dealt with in Chapter 4 and it introduces readers to two classic trilinear hydrochemical plotting diagrams -- the Piper diagram and the Expanded Durov diagram.

Chapter 5 is about Discharge and Catchment Hydrology. This looks at the role of groundwater in generating surface runoff and physical controls on groundwater discharge at the catchment scale.

Groundwater and Freshwater Ecosystems, and Groundwater as a Resource are the titles for Chapters 6 and 7. These are the two areas that are going to be the focus in the years to come.

Groundwater Geohazards in Chapter 8 has Box 8.2 captioned "That sinking feeling: subsidence due to groundwater withdrawal in two mega-cities".

Groundwater under Threat has Box 9.1 captioned "Overexploited aquifers: good or bad? – You decide..." which warns of the use of and depletion of non-renewable groundwater using fossil water to feed the Libyan Great Man Made River Project.

Chapter 10 covers Simulations and Groundwater but without the painful maths normally encountered with this topic.

Most importantly, it closes with Chapter 11 --Does this mean we are heading towards a state of bankruptcy in our renewable water supply? that offers us some hope towards sustainable development with sub-topics listed as "Remediating contaminated groundwaters" using in-situ and ex-situ technologies, including the use of bioremediation technologies.

By Gregory Poi

WE WANT TO HEAR FROM YOU

The SLP Newsletter is circulated among members and other like-minded organizations.
We are always seeking to improve the quality of this publication.

We welcome contributions of interesting news that cover loss prevention in the oil, chemical and process industries.

Please send your contribution or any queries to:

SLP Secretariat

14 Robinson Road 13-00 Far East Financial Building Singapore 048545
Mobile: 9893 0746 Fax: 6483 5418 E-mail: secretariat@slp.org.sg
<http://www.slp.org.sg>