SLP SOCIETY of LOSS PREVENTION news
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# SECURITY VULNERABILITY ASSESSMENT FOR THE CHEMICAL INDUSTRY

On February 13, 2007, Steven Vandermolen, Global Security Advisor of Chevron Phillips Chemical Company based in Houston, Texas, gave a talk on Security Vulnerability Assessment (SVA) to a group of about 30 SHE and security practitioners from JTC, Dupont, Shell, MSD, SUT Sakra, Vopak, Pfizer and other companies.

The objective of this event was to provide an overview on SVA and the methodology used to evaluate the security vulnerability of chemical facilities.

To help his audience understand the subject, Vandermolen defined the following terms.

*Steven Vandermolen fully engaging his audience.*

*Security Vulnerability Assessment* is the process of determining the likelihood of an adversary successfully exploiting vulnerability, and the resulting degree of damage or impact on an asset. The SVA is a:

– "tool" for conducting an assessment and communicating the results of that assessment

– formal and documented process that is "transparent," tractable, and replicable

*Vulnerabilities:* Any weaknesses that can be exploited by an adversary to gain access to an asset. Vulnerabilities can include but are not limited to:

- perimeter and building characteristics,
- equipment or process properties and locations,
- personnel behaviors,
- operational and personnel practices.

Steve pointed out the **Common Vulnerabilities,**

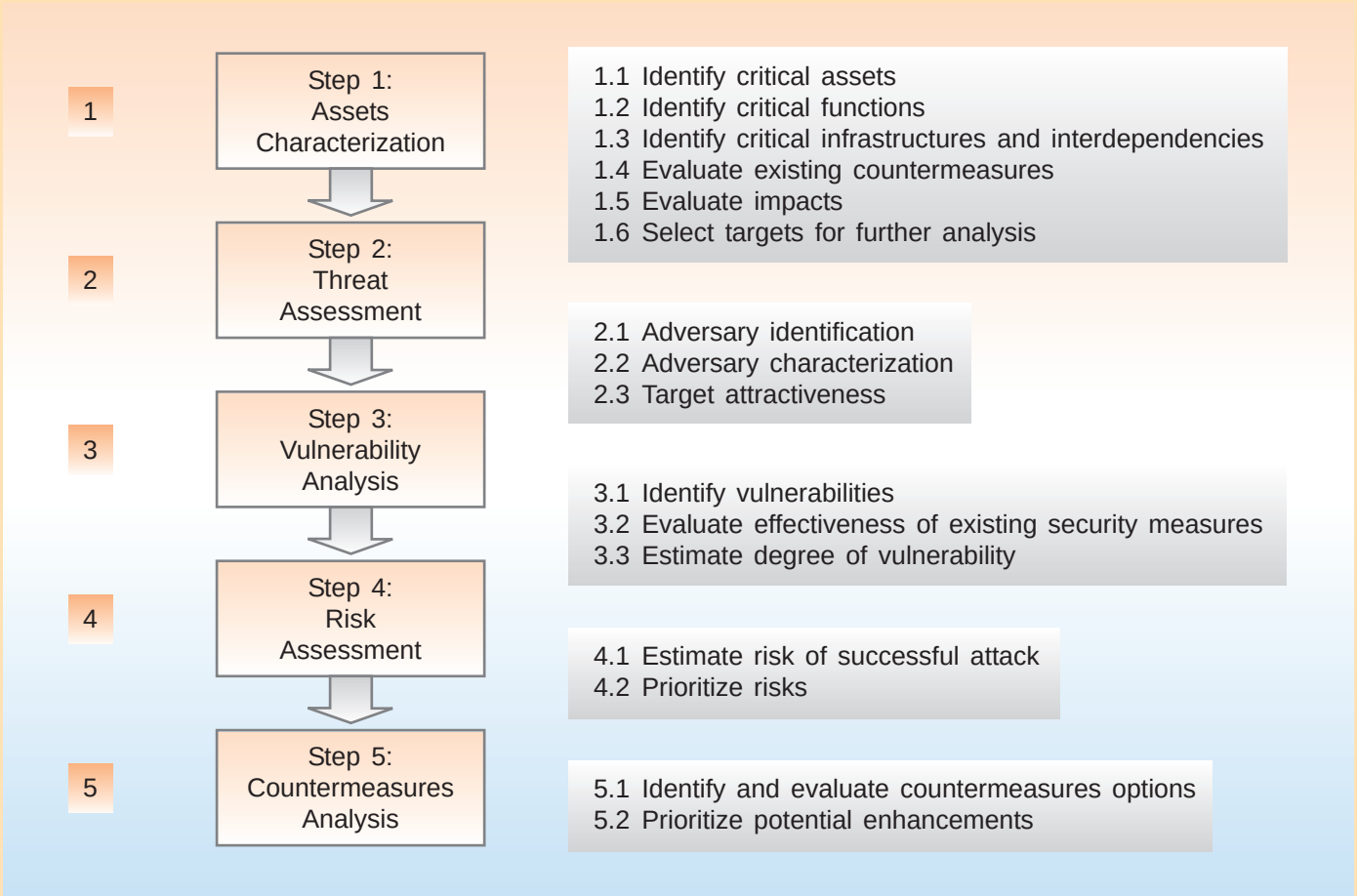
- Inadequate perimeter and other physical security measures
- Inadequate technical security infrastructure or integration
- Inadequate administrative security policies or procedures
- *Insufficient cyber security measures*

*Security Risk* is a function of the:

- Consequences of a successful attack against an asset; coupled with the
- Likelihood of a successful attack against that asset.

*Risk = f (Consequence, Likelihood)*

He then proceeded to discuss the following API/NPRA SVA Process:




Vandermolen concluded the session by sharing the four basic strategies to manage security risks

- Deter
- Detect
- Delay
- Respond

A lively discussion took place after the presentation and during the dinner that followed. Many participants were interested in the software tool for SVA. Companies and organization that wish to learn more about this important subject are encouraged to consult API/NPRA or other providers of SVA methodologies

*By Tay Cheng Pheng*

# GAS, VAPOUR AND DUST EXPLOSIONS & ELECTROSTATIC HAZARDS

## May 22 and 23, 2007

**Venue:** **S'pore Polytechnic Graduates' Guild**
**1010 Dover Rd Gate 4**
**Singapore 139658**

**Fee:** **For the 2-day program: $ 1500**
**For either 1-day program: $ 850**
**For the Technical Talk cum dinner on 22 May 6-9pm.**
Free for Members and 2 Nominees from each Corporate Member.
It is also free for **Attendees** for the training courses.

**** Member discount:** Members and Corporate Nominees will receive discounts of $ 50 for the 2-day program and $ 25 for the 1-day program.

Applications close on **May 7, 2007**

Note: We have applied to MOM to recognise these courses for the grant of SDU's.
In the first run in 2003, MOM approved 14 SDU's for the 2-day program.

**Sign up now! Places are limited.**

**The instructor is Mr. Ian Pavey of Chilworth Technology.**

### Ian Pavey

**M.Phil, C.Phys, M.Inst.P, A.M.I.Chem.E, graduated from Bath University, UK, with a BSc in Chemical Engineering. After acquiring some practical experience of electrostatic hazards while working as a process development engineer, he gained an M.Phil. in Applied Electrostatics, thereafter specialising in electrostatic applications, problems, and hazards. Ian worked for ICI for 11 years on projects involving electrostatic applications research and development. He is currently based in the UK and working as Principal Electrostatics Specialist in Chilworth Technology's Process Safety Consultancy. He has been with the company since 1991.**

We are proud to present a re-run of these 2 courses. As a bonus the instructor, Mr Ian Pavey, is giving a technical talk on case studies relevant to the course subjects. **Attendees for this talk will be restricted to course participants and SLP members. So don't miss out on these valuable insights.**

**These courses are designed so that they can be treated as two stand-alone one-day training courses or as a single two-day course.**

Both training days will present information that is **vital for the safety of personnel** working in any industry in which flammable materials (gases, liquids and powders) are stored, transported, delivered, handled or processed. The examples include bulk chemical, dyestuff, fine chemical, food and drink, metal, petrochemical, petroleum, pharmaceutical, waste treatment and many others.

## DAY 1: GAS, VAPOUR AND DUST EXPLOSIONS

- **Explosion Basics**
  What are the basic features and parameters relating to explosions.

- **Flammability Characteristics**
  Characterisation of flammable atmospheres, and interpretation of the results.

- **Prevention of Dust, Vapours and Gas Explosions**
  Methods of avoiding explosions involving different types of flammable atmospheres.

- **Protection against Explosions**
  What measures can be taken to mitigate the effects of an explosion if the worst does happen.

- **Opportunity for Questions and Discussion**
  Some time will be available to answer any outstanding questions, or to discuss particular issues as a group or privately.

## DAY 2: ELECTROSTATIC HAZARDS

- **Understanding Static Electricity**
  An introduction to the fundamentals of static electricity will ensure that all delegates start with the same basic information.

- **Flammable Atmospheres**
  This can be seen as a brief recap for those attending Day 1, or a short overview of flammable atmospheres for those only attending Day 2.

- **Electrostatic Hazards Assessment**
  This session will provide a systematic technique for assessing whether or not an electrostatic hazards exits.

- **Measurements in Electrostatics**
  An introduction to electrostatic measurements reveals some of the techniques employed how to interpret the results, and their limitations.

- **Control of Static Electricity**
  Methods that can be used to minimise or eliminate electrostatic hazards will be presented.

- **Video**
  A short video will help to pull the information presented during the day together.

***HURRY! HURRY!*** Please contact Ms Penny Pan at our Secretariat for registration.

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# PRESIDENT MESSAGE

In our last Newsletter, we had two articles on the catastrophic accident that occurred at the BP Refinery at Texas City on March 23. 2005. In this note, I would like to refer to the 3 key areas that were identified by the James Baker Inquiry as system failures that led to the catastrophe.

These 3 key areas were,
(1) Corporate Safety Culture;
(2) Process Safety Management; and
(3) Performance Evaluation, Corrective Action, and Corporate Oversight.

Of these 3 areas, Corporate Safety Culture drew a great deal of attention in the US as "Safety Culture" is rarely identified as a major root cause of catastrophic accidents in the history of process industries. It raised several questions.

What is "Safety Culture"?
What is considered as the right Safety Culture for a company?
Are there any yardsticks to measure Safety Culture or any numbers assigned to gauge Safety Culture?

Most managers and professionals would probably know what "culture" means. But how does "Safety Culture", especially at the corporate level, seriously affect the integrity of the safety program of operating units when these units are remote from the company's headquarters. The answer to this question may be discered from the following.

Do any of the following statements from the Baker Report sound familiar to you?

- The company has not adequately established process safety as a core value across its five U.S. refineries.
- The company has not provided effective leadership on or established appropriate operational expectations regarding process safety performance at its five U.S. refineries.
- The company has emphasized personal safety but not process safety.
- The company mistakenly used improving personal safety performance (i.e., personal injury rates) as an indication of acceptable process safety performance at its five U.S. refineries. Its reliance on this data and inadequate process safety understanding created a false sense of confidence that it was properly addressing process safety risks at those refineries.
- The company's five U.S. refineries have had high turnover of refinery plant managers, and process safety leadership appears to have suffered as a result.
- The company has not established a positive, trusting, and open environment at some of its U.S. refineries with effective lines of communication between management and the workforce, including employee representatives.
- The company does not have a designated, high-ranking leader for process safety dedicated to its refining business.
- The company has not always ensured that the resources required for strong process safety performance at its five U.S. refineries were identified and provided.
- The company's corporate initiatives have overloaded personnel at its five U.S. refineries, to the possible detriment of process safety.
- The company's operations and maintenance personnel at its five U.S. refineries sometimes work high rates of overtime, which the Panel believes impacts their ability to perform their jobs safely and increases process safety risk.
- The company's decentralized management system and entrepreneurial culture have delegated substantial discretion to U.S. refinery managers without clearly defining process safety expectations, responsibilities, or accountabilities.
- The company has not demonstrated that it has effectively held executive management and refining line managers and supervisors, both at the corporate level and at the refinery level, accountable for process safety performance at its five U.S. refineries.
- Each of its five U.S. refineries has its own separate and distinct process safety culture. Some are far more effective than others in promoting process safety, but significant process safety culture issues exist at each of its five U.S. refineries, not just Texas City.
- Instances of a lack of operating discipline, toleration of serious deviations from safe operating practices, and apparent complacency toward serious process safety risks existed at each of its five U.S. refineries.

After reading these findings, it behooves us to embark on a detailed assessment of our own operations and our "safety culture" shortfalls. Where gaps are uncovered, action should be taken to eliminate them. We often neglect the very basic foundation of our EHS and loss prevention program – our Safety Culture – the way we do things and our collective values, beliefs, attitude and behavior on “how safe is safe”. Even if you think that you have the right safety culture, you should assess whether there is a **robust system** in place to ensure **operating discipline** across the board.

# EDITORIAL

By the time this issue of our newsletter is published, the first quarter of 2007 will be over. This year is shaping out to be as busy if not more busy than 2006. Like other people, our members are part of this ‘busy-ness’ phenomenon. This is reflected in the change in our job scope – across subjects and geographies. Nowadays, security is part and parcel of the SHE Manager’s job. In addition, many of our members have responsibilities for the Asia Pacific region. It is not uncommon for our members to meet each other more often at international airports than at home in Singapore.

It is appropriate that we have an article on Security Vulnerability Assessment (SVA) in this issue. This systematic approach to a tough subject gives an assurance that all angles are covered. Senior management and other stake holders can have more confidence in an organization that conscientiously does this exercise than one that does not. It does not guarantee that no incident will ever happen. But it does ensure that an organization would know how to react should an incident occur.

Our President addresses the question of a ‘safety culture’ for an organization. The best way to think of ‘culture’ is to say that it (culture) is manifested in the way members of an organization conduct themselves on a day to day basis -- it is seen in the behaviors of the people. Obviously it is not something that happens overnight. At the same time, it is not something that is unchangeable. Safety professionals understand that to change a safety culture, they must first influence the behavior. Fortunately, psychologists now understand how this can be done and practicing safety professionals can use this knowledge to influence behavior and ultimately to produce a new safety culture that upholds good safety practices.

After a break, we now resume our practice of doing a book review. The review by Greg Poi deals with water treatment.

After 3 years SLP is offering again 2 courses on May 22 and 23, 2007. The courses on Gas, Vapor and Dust Explosions and Electro-static Hazards will benefit many industries in Singapore such as pharmaceutical manufacturing, chemical and petro-chemical manufacturing, petroleum refining, petroleum transportation and storage facilities and many others. See the announcement.
Members are urged to book early.

We are taking advantage of the presence of the course instructor for the above courses, Mr Ian Pavey, to hold a technical talk on case studies involving the topics covered by him.

March is our financial year end and members would have received invoices to cover subscriptions for 2007/8. Members are urged to pay their subscriptions promptly. This will reduce the need for reminders. Note that reminders cost money and this money can be better spent on other worthwhile activities.

# Book Review

*This is a review of a book by D S Singh on, Water Treatment made Simple (for Operators), John Wiley and Sons Inc,, Hoboken, NJ, USA, 2006*

True to its title, it is relatively easy to understand compared to typical textbooks on the subject.

Since this book is written for an American audience, the introduction covers the Safe Drinking Water Act (USA), and the increased awareness that community water systems are increasingly not in compliance with drinking water standards. It discusses the role of USEPA and the alarming presence of cancer-causing compounds, and how "water treatment has become a very serious business". While this is true for America, we who are outside the US cannot rest on our laurels.

Some of the items listed as common water treatment additives in Table 1.1 USEPA National Primary Drinking Water Contaminant Standards will cause unease to many of those seeing it for the first time. Operators will find a new respect for their role and contribution to keeping the water supply safe to drink.

His coverage on water sources is simple to read and is comprehensive. He next covered Pretreatment, Coagulation and Flocculation, Sedimentation, Softening, Stabilization, Filtration, Disinfection, Taste and Odor Control, and Fluoridation.

The topics on water transmission and hydraulics are well thought out with clear and simple-to-follow diagrams.

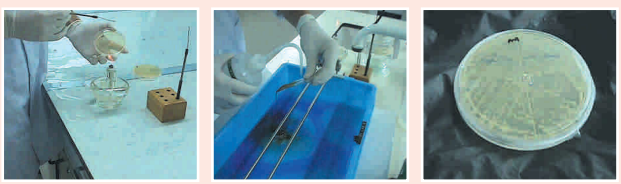
The coverage on the foundation topics of mathematics, chemistry and microbiology are well written, clear and concise. As an example, the treatment on chemistry is crisp and to the point in the coverage of important concepts related to acids and bases, solution and concentration. Besides the expected references to pathogens and coliforms, the microbiology topic even includes an introduction to the binomial nomenclature system.

These are a delight to read and will benefit any instructor who will pick up a few ideas about developing effective teaching materials. Dr Singh writes in plain and simple English, devoid of techno-jargon that is used so often in our trade.

Interestingly, he has included 'handy' problem-solving tables to help operators trouble shoot.

To top things off, Dr Singh has included a self-review at the end of each topic.

This book is highly recommended for operators.



*Microbiological tests for water purity.*

*"A test is not better than the sample, and the sample is not better than the manner in which it was collected."*

*By Greg Poi*

# CHANGE FORM

Keeping members' particulars current is a challenge for our Secretariat. This is important for administrative reasons, the most important of which is communications. The cooperation of members is therefore sought in keeping their particulars current. Whenever there is a change, please e-mail our Secretariat --- Penny Pan, E-mail Address: secretariat@slp.org.sg

**And supply the following information:**

Name:

Grade of Membership or Corporate Nominee:

Name of Employer (if applicable):

Position title (if applicable):

E-mail address:

Postal address:

Tel. (Home): Tel. (Office):

Mobile:

Please **highlight** the change/s.

For Corporate nominees, please inform the Secretariat whenever you have ceased to be the nominee or if a new person has been named as a nominee. Please supply the particulars of the new nominee.

Thanks for your cooperation.

Ngiam Tong Yuen
Hon. Secretary

# 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:

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