SLP SOCIETY of LOSS PREVENTION news
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BUILDING SITING :

A Fresh Look

Kenneth Harrington, Senior Process Safety Adviser, Chevron Phillips Chemicals (CPChem) Company in Texas presented a talk on "Building Siting - A Fresh Look" to more than 40 SLP members and guests on September 27, 2006 at The Chevrons

What can happen when things go wrong

Ken cited the unfortunate accident at BP's Texas City refinery on March 23, 2005 that resulted in 15 fatalities and 170 injuries. This was a watershed process safety event. It triggered the reassessment of safety norms on many different fronts. One of the most obvious reassessments is the placement of trailers and the entire subject of building siting.

In his presentation, Ken discussed the immediate, current, and future activities related to building siting in the chemical process industry. Ken also discussed Chevron Phillips Chemical's proactive approach to building siting assessments worldwide.

He outlined the following key recommendations made by the US Chemical Safety Board (CSB) based on their investigation of BP's Texas City accident:

- **Key elements of CSB investigation**
  - Placement of portable buildings
  - Abnormal startups
  - Blowdown stacks
  - Vehicles in the plant
  - Operator training & supervision
  - BP safety management systems and safety culture

- **CSB Recommendations to industry**
  - Urgent
    - API to give new guidance on placement of trailers and similar structures
    - API/NPRA to notify members on the placement of trailers away from hazardous areas
  - Alert
    - vehicles in the plant

The full investigation report is available at the Chemical Safety Board (CSB) website: http://www.csb.gov

Ist picture from the left:
A section of the audience listening intently -- not missing a beat

2nd picture from the left:
Another view of the audience -- listening just as intently

Ist picture from the right:
Ken Harrington in full swing of his presentation

2nd picture from the right:
See Hee thanking Ken for a job well done

Ken also discussed and shared Chevron Phillips's building siting requirements for their chemical process plants. He highlighted the following key points:

Existing facilities:

- Portable buildings should be relocated at least 400 feet away from hazards unless they are designed and rated for:
  - Explosion – 1 psi (except for windows – 0.5 psi)
  - Fire – 8,000 BTU/hr-ft2

- All permanent buildings regardless of occupancy need to be analyzed per API RP 752 using risk based assessments.

- Portable buildings should not be used for shelter-in-place for toxic releases.

- All vents (non-manually activated pathway from the process to the atmosphere) need to be identified, analyzed, and mitigated if necessary using API RP 521 for guidance on analyzing vents hazards.

- Each plant needs to develop programs to manage changes that affect building siting decisions, control of ignition sources, including a review of vehicle policies, control of personnel during startup and shutdown of units.

New facilities:

- New buildings should be located using minimum separation distances stipulated in the company's (Chevron's) engineering standards

- New control buildings should preferably be built as close to the process as possible and to the hazards at the building location associated with the maximum credible incident.

- Blast modeling to be included in early project planning to help assess the plot plan layout and optimize facility spacing.

The evening talk was very interesting and informative. Our President, Ong See Hee ended the proceedings by thanking Kenneth Harrington for his efforts and support for SLP and presented him with an SLP memento.

By Tay Cheng Pheng

This is the story of a disastrous accident that happened to a well-respected company with worldwide operations. It holds many lessons for all manner of industries.

It took place on Wednesday, March 23, 2005 at the Texas City Refinery of BP Products North America Inc. During the startup of the Isomerization Unit, explosions and fires occurred, killing fifteen and harming over 170 persons apart from extensively destroying property within the plant and the surrounding area.

Can you afford a "TEXAS CITY" Accident?

What can we learn from such a disaster?

BP acknowledged that it was a preventable accident. It happened because of a process failure, a cultural failure and a management failure. The question, of course, is why these deficiencies were allowed to develop over the years – and why they were not sufficiently identified and addressed before the event.

It is rather disconcerting that such a catastrophic accident can happen to a reputable and publicly listed company. Those who are familiar with BP's safety culture and safety management system can reasonably expect it to have

- A concerted, systematic approach to safety.
- Personal accountability for safe operations – from contractors to plant managers.
- Frequent audits of their major operating facilities to assess compliance with corporate standards and expectations.
- Employees who feel empowered enough to raise safety concerns and to stop work if they think conditions are unsafe.
- A comprehensive HSE management system framework defining the company's expectations for managing safety and accident prevention, and plant and equipment integrity.

In addition, BP has minimum standards across the organisation for - permits to work, energy isolation, confined space entry, working at heights, lifting operations, driving safety and management of change etc.

Obviously, on March 23rd 2005 these were not functioning as expected.

The consequences were disastrous:

- Anger in the local community.
- Intense regulatory scrutiny.
- Litigation.
- Massive unfavourable media coverage, and
- Attacks on BP's motives, competence and commitment to safe operations.

In the end, BP identified five main underlying causes:

1. The working environment had eroded to one characterized by resistance to change and lack of trust, motivation and purpose. Expectations around supervisory and management behaviour were unclear. Rules were not followed consistently. Individuals felt disempowered from suggesting or initiating improvements.
2. Process safety, operations performance and systematic risk reduction priorities had not been set nor consistently reinforced by management. Safety lessons from other parts of BP were not acted on.
3. Too many changes in a complex organization – both of structure and personnel - led to a lack of clear accountabilities and poor communication. The result was workforce confusion over roles, responsibilities and priorities.
4. Poor hazard awareness and understanding of process safety on the site - resulting in people accepting higher levels of risk.
5. Poor performance management and vertical communication meant there was no adequate early warning system of problems and no independent means of understanding the deteriorating standards in the plant.

Many WHY's were raised:

- **Why was there no active supervision present at the ISOM unit during the restart?**
- **Why did operators print the start up procedure but not follow it?**
- **Why wasn't documentation about previous incidents more complete?**
- **Why locate trailers so close to the blow down stack?**
- **Why were so many vehicles in the process areas at the refinery?**
- **Why had the site missed opportunities to replace blow down stacks?**
- **Why did the measures, taken at the refinery over the last few years to improve safety standards and work practices, not have more (positive) impact?**
- **And why hadn't BP made more progress at addressing the low morale and distrust of site management (revealed in people assurance surveys) at Texas City?**

In the aftermath of the incident, BP humbly and swiftly carried out a damage control exercise by:

1. Accepting full responsibility for what happened inside the boundaries of its site.
2. Providing timely and humane support to the victims of this tragedy and their families.
3. Allocating all the necessary resources to determine the cause of the explosion and fire and take any action necessary to prevent a recurrence.
4. Guaranteeing full cooperation with government agencies investigating the accident and promised to make public BP's own investigation.

Other remedial actions taken to prevent recurrence included:

1. Putting a new management team in place at Texas City, simplified the organization, improved communication, clarified roles and responsibilities and took steps to verify compliance with operating procedures.
2. Creating a project team to co-ordinate and track implementation of the recommendations and the corrective actions agreed with OSHA.
3. Creating a new Corporate Safety and Operations organization to improve the transfer and incorporation of relevant learnings. BP also enhanced its audit program, building in independence at the same time – with emphasis on making sure systems and procedures are in place and used effectively. It established new standards designed to foster greater rigor and consistency for control of work and integrity management across the BP Group.
4. Committing US$1 billion over the next five years to upgrade and maintain the Texas City site. Among other things, BP would be installing modern process control systems on major units, eliminating the use of blow down stacks in light service and improving workforce training.
5. Introducing a new engineering technical practice governing the use of temporary buildings inside refineries and other processing plants. Since then BP moved 400 workers to a new office building in downtown Texas City.

Picture showing the offending blowdown drum and stack that were the initiating points of the fire.

With an accident of this scale, the lessons learned are many. At the facility level several concerns stand out:

1. The need to ensure plant leadership teams have the time to focus on day-to-day operations and know what's happening in their control rooms and on the plant.
2. The need to capture the **right metrics** that indicate process safety trends; and **not just personal accident measures**.
3. The need to update procedures and ensure that they are routinely followed.
4. The importance of two-way communication. If the leadership team does not listen or seriously treat concerns that are raised, then they stop coming. Staying in touch, being aware, being responsible and listening helps build trust.
5. The importance of investigating process incidents/upsets and loss of containment incidents the same way serious injuries are investigated.
6. The value of having an effective feedback loop to capture and incorporate lessons learned from earlier incidents and process upsets into operating procedures and training programs.
7. The need to keep non-essential personnel out of process areas. The safest way is to move them outside of blast zones.

In conclusion, the factors that contributed to the explosion at Texas City were years in the making. The deficiencies that were identified would require a concerted sustained commitment and a painful tedious process to rectify.

While we can be fairly sure that BP has swallowed the bitter pill, can we say the same about us?

By Jacob Soh

Readers who want to find out more about the investigation may consult the Chemical Safety Board (CSB) website: http://www.csb.gov

President's Message

2006 saw many initiatives and changes in the safety, health and environment arena. These were driven by our own local regulatory agencies, professional institutions and international organizations.

In Singapore, the enactment of the Workplace Safety & Health Act, which replaced the more than 30 years old Factories Act, impacted industries in varying degrees depending on the maturity of their occupational safety and health and accident prevention program. Senior managements are now expected to raise their commitment to protecting the safety and health of their employees and members of the public even as they strive to earn a fair return for their shareholders. Singapore has to attain first world standards in safety, health and environmental protection as we journey along the road to a first world economy.

Although Risk Management, in particular Risk Assessments, is familiar to the oil, chemical and process industries, there is still much to do to fully comply with the new regulatory requirements. Companies are expected to conduct risk assessments for both routine and non-routine tasks and activities, including various trades performed by 3rd. party contractors. In all this work, the key objective is accident prevention – in line with SLP's charter in loss prevention – namely preventing injury and loss of life, damage to the environment, and loss of property and business.

SLP has an important role to play in helping its members get up to speed in Risk Management. We have and will continue to provide opportunities for members – individuals and corporate nominees – to share information and their experience in Risk Management. We will do this through short courses, technical talks, informal gatherings and forums. These events are also open to other interested people – non-members and persons outside the oil, chemical and process industries.

Members are urged to strongly support SLP through their active participation in these events. As members will appreciate, these events do not come easy – much sweat is expended by the organizers.

Internationally, the Globally Harmonized System (GHS) in classification and labeling of chemicals gained much momentum through the involvement of international organizations. A member of the SLP Executive Committee who is a subject matter expert in GHS is none other than our Immediate Past President, Richard Gillis. He is a well-known figure in the industry here in Singapore. He has had a long and fruitful association with SLP as well as other industry organization such as the Singapore Chemical Council's Responsible Care Committee.

This is an opportune time to speak about Richard because he is embarking on another exciting phase of his life – his well deserved retirement (in December) from ExxonMobil Chemical Asia Pacific. Richard is leaving Singapore after more than 14 years to return to his home in Melbourne. He will be missed by all his friends here.

Thank you very much Richard for your contributions to SLP. We wish you and Kay a very long and happy retirement.

Editorial

2006 has passed very quickly. It is good and bad. Good because it means we are reasonably happy and enjoy what we are doing and time seems to pass quickly. Bad because the pace is so hectic and we have hardly enough time to catch our breath. So the year-end holidays are a welcome respite for us to slow down a little, relax and re-charge our batteries.

As our President says in his message, 2006 has brought many changes to the SHE scene. The Workplace Safety and Health Act (WSHA) has forever changed the way we do our business in Singapore. Perhaps our industries are more prepared than others to deal with the changes. But we cannot be complacent. We have to live with the constant realization that a BIG ONE will hit us even when we think we are prepared. Witness the big disasters that have taken place in the recent past in USA and Britain. These countries do not lack in legislation and human resources.

SLP has been cognizant of these risks. Our Technical Talk in September was on the siting of buildings – temporary and permanent – in process plants. This re-look at existing standards took place as a result of the BP accident in Texas City in March 2005. The new standards that are being proposed will dramatically increase 'safe distances' and structural (blast resistance) standards. All process – chemical, petro-chemical, petroleum refining – plants around the world will need to take urgent action to review their existing situations as well as to include these considerations in their new designs. This will not be a cheap exercise.

In the same vein, readers should read the article by Jacob on the lessons from the BP accident. It makes for sombre reading. There is no room for complacency.

We are organizing a Technical Talk in February 2007 on Security Vulnerability Assessment (SVA). In this day and age, security cannot be far away from the minds of any management. This tool, SVA, developed by the Center for Chemical Process Safety (CCPC), is a systematic way for us to manage security risks and to identify opportunities for improvement.

As a matter of record, the talk in September was the best attended SLP event of its kind. This is an indication of the degree of interest in building siting. We expect the same response for SVA. So please respond early when we make the announcement on the date.

Our Technical sub-committee will be implementing an exciting program of talks, training courses and seminars in 2007. Watch out for our announcements.

We cannot end this editorial without paying a tribute to Richard Gillis, our Immediate Past President. As some of you know, Richard has retired from ExxonMobil Chemical and has returned to Melbourne. He has had a long and fruitful association with us. For the six years that he was President and for many years before that, Richard contributed his time, talent and expertise to SLP and the community at large. He was and is a really hands-on person. He recently received a Merit Award from SPRING Singapore for his many contributions to SPRING and its predecessors. He was a regular contributor to our conferences, seminars and training courses – paper writer/presenter, instructor and workshop leader. He ably represented SLP to our outside audiences. Fortunately for us, he plans to regularly visit Singapore. So we can still tap on his knowledge. To Richard and Kay, we wish you a long and happy time in Melbourne.

To all our members and readers, have a Happy and Safe Holiday Season and throughout 2007.

Early Announcement

We are pleased to announce a Technical Talk on:

SECURITY VULNERABILITY ASSESSMENT

By: Steven R. Vandermolen, Global Security Advisor
Chevron Phillips Chemical Company LP

The talk is scheduled for February 2007 (the actual day to be announced later):

Synopsis:

The first step in managing security risks is to identify and analyze the threats and vulnerabilities facing a facility. The recommended way of doing this is by conducting a Security Vulnerability Assessment (SVA).

The talk will provide an over view of the methodology, developed by the Center for Chemical Process Safety (CCPC), to do an SVA. It is a systematic approach to:

- Identify security exposure, threats and vulnerabilities,
- Evaluate existing countermeasures, and
- Identify opportunities for improvement.

The speaker will also share his knowledge and experience on security in general.

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:

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Position title (if applicable):

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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:

SLP Secretariat
32 Maxwell Road #03-07 Singapore 069115
Tel/ Fax: 6764 7238 E-mail: secretariat@slp.org.sg
http://www.slp.org.sg