Safety & Loss Prevention
Subject Group Newsletter

Issue 38, September 2008
Editor: Dr John Bond, email: john.bond007@ntlworld.com

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SAFETY AND LOSS PREVENTION SUBJECT GROUP
NEWSLETTER

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EDITORIAL
While clearing out some old 1970s books from my library I found “Fuel’s Paradise” by P. Chapman. It refers to climate change, carbon dioxide levels etc and has a nice quote:

You can fuel all of the people some of the time and
You can fuel some of the people all of the time but
You can not fuel all of the people all of the time.

An ICAO Working Group is taking another step forward in proposing “A just culture will greatly facilitate the reporting and sharing of safety data as an essential contribution to enhancing safety in international aviation” See Automatic prosecution under fire.

STACK ‘EM HIGH? KEEP ‘EM SAFE!
The meeting of the Subject Group was held at the Health and Safety Laboratory, Buxton on the 3 June 2008. The objective of the meeting was to raise awareness of fire risks in warehouses and intermediate storage, to review lessons learned from different sectors and to see research results. Chris Beale opened the meeting with a talk on “IBC Incidents and Failure Mechanisms - A review of Operating Experience.” IBCs were common in industry and were used for many low hazard materials and consisted of a container in a cage and on a pallet to allow transportation by fork-lift truck. Typical construction materials were heat treated timber, plastic and steel. Pallets were normally stamped, indicating the manufacturer and date of manufacture. The design of the IBC provided containment for chemicals in a translucent plastic which is strong and easy to manufacture. Coloured containers were used to differentiate between different products. Black containers were used to reduce photo-initiation and white containers used to reduce solar heat input. The design allows for an ullage space above the liquid level and were typically 1,000 litres in size, had top screw cap for filling and a recessed outlet valve at base with screw tap and tamper proof seal. Some IBC’s are fitted with simple pressure relief devices which were attached at the fill point. The metal cage design provides mechanical strength for the IBC and is attached to the pallet. Hazardous chemicals often had additional or stronger fixings to improve integrity and a nameplate to allow contents to be identified. Safe operation was largely determined by people using them in supply chain, often re-used and handled by relatively unskilled staff. Failure scenarios were;

Offsite transport - Small inventory but potential to disperse small quantities over a wide area to disrupt key transport infrastructure
Unignited Small release – localised high frequency event
Ignited onsite Initiating event – potential to spread to other IBCs or site areas
Fuel source Large inventory – fire escalation

Case studies described a loaded trailer but empty truck overturned at roundabout. A leak of a viscous material on a motorway caused a skid risk over several hundred metres of the carriageway. The motorway was closed for
several hours causing national traffic disruption. Other identified failures included failures with forklift trucks, operational errors, process, integrity, supply chains and automatic packing machine failures. Storage problems included racking collapses, spiking by forklift truck and chemical decomposition.

In conclusion they had identified 22 IBC failure mechanisms based on operating experience. Analysis suggested that there were typically 11 IBC loss of containment incidents per year on the large site. Some were small pinhole leaks eg. nail puncture, others are catastrophic eg. polymerisation. Data could be used as input data for a QRA / fault tree analysis with the following caveats:

- Data covers a range of leak sizes.
- Data covers hazardous and non-hazardous IBCs.
- Data collected over a 33 month period, 2005 – 2007

The second speaker was Dr Graham Atkinson who described “Warehouse Fire Research” at the HSL. It was important to know how fast do fires grow, how do warehouses respond, are there significant toxic risks from smoke, when will your warehouse burn down? Warehouse fires grow rapidly due to high stacks, with combustible packaging and low density/thermal conductivity materials e.g. plastic foams, flammable liquids, powders and oxidisers. Short videos on tests of pallets, rolls of foam, flammable liquids in plastic bottles, combustible liquids in IBCs and wood dust were shown.

The assessment of the level of risk from a given stock was difficult to predict but there was nothing better than a large scale test with stacks of plastic drums filled with aqueous products. Fire development was difficult to predict. A typical pallet burning in the open was 20 – 30 minutes and typical warehouse fire duration was 4 – 6 hours. Warehouse fires would go on for weeks if it were not for additional (fire induced) venting from melting skylights, structural collapse and distortion/shattering of cladding.

An important is can fires disperse toxic materials? For example organic phosphorusoxychloride 30% survived at 6 metres a vent. With limited venting and no external burning there was survival of toxic material and with restricted plume lift-off there was significant toxic risk. When the roof is ruptured there is external burning of the toxic fumes giving high buoyancy and plume lift-off. Warehouse fires are common and on average (all types of occupancy) your warehouse will burn down every 100 years.

The third speaker was Ceri Petrie who gave a “Round-up of Guidance” covering

- What we want to avoid
- HSE guidance
- Non-HSE guidance
- How to access the guidance
- Review of HSG71, Chemical warehousing: The storage of packaged dangerous substances.

Generally fire is considered the greatest risk in a warehouse but statistically the main causes of accidents in warehouses are:

- Slips and trips
- Manual handling
- Work at height
- Vehicle movement
- Moving or falling objects

The main causes with examples were

- Lack of segregation
- Unsuitable building
- Failure to control ignition sources
- Poor housekeeping
- Poor traffic management
- Use of damaged pallets
- Incorrect stacking of goods but this was not an exhaustive list.

Guidance for warehousing and storage was given in free leaflets

- A guide to Health & Safety, HSG76
- Chemical warehousing: The storage of packaged dangerous substances, HSG71
- Workplace transport safety: an employer’s guide
- Manual handling: solutions you can handle
- Slips and trips; guidance for employers on identifying hazards and controlling risks

Non HSE Guidance was given in:

- BAMA standard for consumer safety and good manufacturing practice: module 6, aerosol warehousing
- Joint CBA / SIA guidance for the storage of liquids in IBCs
- Fire safety risk assessment in factories and warehouses, DCLG publication
There was a review of HSG71 covering chemical warehousing: the storage of packaged dangerous substances with additions on Hazardous area classification, aerosol storage, Intermediate Bulk Containers (IBCs), storage of hazardous wastes and process safety performance indicators (PSPIs).

To take part in the consultation service for HSG71, please e-contact Ceri Petrie by email at: ceri.petrie@hse.gsi.gov.uk

The consultation ends in July 2008 and plans were to publish later in 2008.

The next speaker was Derek Simpson of BASF who talked on “Learning from the Propylene Warehouse Fire at BASF 9th October 1995. The basic details of the warehouse, in the centre of a multi company site, was given. The fire was reported at 0400 hours and a major emergency called at 0448 hours. At its peak 40 fire appliances and 200 fire-fighters were deployed. 40,000m$^3$ of water and 150,000 litres of foam were used to control/extinguish the fire. 40 people were present in the incident room. The Press were requesting interviews at 7:00am and a press conference was eventually held at 9:50am. The incident was declared over at 1450 hours.

There were many safety features included in the design of the warehouse, all of which operated satisfactorily, but the source of ignition was probably a fault in a light fitting which caused overheating and the acrylic reflector to ignite. The burning reflector fell on product stored below it and ignited the packaging.

Many lessons were learnt. The combination of age, design and continuous operation of the light fittings contributed to the probable source of ignition. This developed into a fire when the warehouse was not manned. Lights were never turned off to reduce the frequency of tube failure and repair. A major overhaul had been carried out in September 1994 but configuration of the stock layout prevented access to several rows of lighting. Location of warehouses should be reviewed with respect to the potential hazards posed to adjacent plants and vice versa. For example a pipe bridge containing essential utilities for other plants on site ran along the wall of the building. The presence of other facilities within warehouses should be reviewed from an operational and potential hazard aspect. For example all stock records, FLT training records, some maintenance records etc. were kept in the warehouse and were destroyed in the fire. The FLT repair facility was lost.

Other lessons learnt included checking for potential hazards that could result from the impact of a fire, or could encourage the spread of a fire. The main concerns were the roofing of the building, specifically the plastic skylights which contributed to the rapid spread of the fire, and the presence of asbestos in the ‘Galbestos’ sheeting on the oldest part of the building roof. The design, location, alarms and annunciation of smoke and fire detection systems should provide effective and accurate early warning. Sprinkler systems should be considered for polypropylene storage if early detection is not possible and if fast fire fighting response cannot be guaranteed. Risk assessments/hazard reviews should be carried out for such storage and the findings incorporated in on and off-site emergency plans. In this case polypropylene was regarded as low risk. After the fire this product was stored in the open air.

Management systems and controls needed to be established for the warehouse and regularly audited for compliance. E.g. electrically operated equipment was turned off at night but not isolated, external doors were closed but not locked (access not controlled, especially at night when unmanned), and one of the fire doors was kept open for ease of FLT access.

There was a great deal of external interest for some time after the incident e.g. local and national politicians, local community groups, press, etc which needed to be properly managed.

“Not just Chemical Plants. A Marine View” was given by James Kelman. Shipping accounted for 90% of world trade with many vessels and of varying size. Time at sea varied from 1 day to 8 weeks and there was a rapid growth in container traffic causing pressures on management and crews. Containers were becoming warehouses at sea with high value cargoes (frozen shrimps $1m in a single container) and environmental problems with fumigants such as methyl bromide and aluminium phosphide. There were problems with fire fighting response. There were hazards not found with shore based warehouses such as groundings and collisions, adverse weather conditions, loss of containers onboard.
Fire was the cause of 25% of all total losses and 10% of fatalities. They were difficult to handle requiring cooling and stability problems. A variety of problems were described with different cargoes including heat sensitive material, batteries, substances liable to spontaneous combustion and moisture sensitive substances. Current problems included the growth of container traffic, diverse nature of the cargoes, new products, lack of detailed knowledge of cargo manifests and lack of experienced officers and crew.

The day at Buxton was completed with a demonstration of the effect of ventilation on fire development.

**RISK IN THE LEISURE INDUSTRY**

The Hazard Forum held an evening meeting at the Institution of Civil Engineers on the 11th March 2008 to discuss the lessons learned from the loss of the yacht Ouzo. The meeting was chaired by Dr. Dougal Goodman and was sponsored by Lloyd’s Register, Catlin and the Department of Transport.

Mr. Steve Clinch, Deputy Chief Inspector of the Marine Accident Investigation Branch, Department of Transport started with a talk “Lessons Learned from the loss of the yacht Ouzo”. The Marine Accident Investigation Branch was setup following the Herald of Free Enterprise disaster and is separate from the regulatory side. The MAIB does not prosecute or establish blame or liability and is responsible to the Secretary of State for Transport. The MAIB has a similar position to the Air Accident Investigation Branch and the Rail Accident Investigation Branch.

The MAIB issued flyers to merchant and leisure industries containing key safety lessons which are contained in the report. The Department of Transport’s Medical Advisor has considered relevance on use of photochromic lenses to other modes of transport. P&O Ferries issued a number of fleet circulars to address key findings. Recommendations were made to the British Standards Institute to consider making crotch straps mandatory part of standard for lifejackets and to the International Chamber of Shipping that in the next revision of Bridge Procedures Guide to include clear guidance on night vision adaptation, clear guidance on good blackout procedures and advice on the effect on night vision of “white light”. The investigation report
and research reports are available on www.maib.gov.uk

The second talk was given by Mr. Karl Lumbers of the UK P&I Club titled “The Ouzo incident - a commercial insurance perspective”. He first of all outlined the interests of the P&I Club as provision of Third Party Insurance, being Non profiting making, having Common interest of assured ship owners and covering the main risks of collision, pollution, cargo, damage, damage to fixed and floating objects and personal injury. The P&I Club covered 4,000 ocean going ships of many companies covering quality and inspection. There was a view that shipping as an industry was now over inspected. With respect to the leisure industry, the P&I Club are concerned with collision, pollution, wash damage, floating containers, the risk to shipping interests, embarrassment of incidents, groundings and criminal proceedings. As risk managers they have to consider the frequency and consequences of any incident. The risks are low but there are many standards for commercial shipping including International Mandatory Standards, Company Standards, Personal Standards and the possibility of Criminalisation. The leisure industry has few International Mandatory Standards, Personal Standards and are seldom subject to Criminalisation. The Shipping Industry is subject to economies of scale, as demanded by consumers hence smaller general cargo ships are being replaced with much larger container ships.

Passenger ships are now taking 5000 passengers. As a result of these demands the ships are less manoeuvrable, are subject to windage, draft clearance can be as low 1 foot, restricted visibility and greater distances with bridge wings to control units. The leisure industry has to make themselves more aware of these conditions.

With the boom in the shipping industry there is evidence of a shortage of experienced people and a pressure to promote them but certification is one thing ability to do the job is another. Recruitment is difficult with youngsters not wanting to go to sea to see the world. The leisure industry seems to be expanding with more yachts and other sea craft. The manning issue for commercial shipping is becoming a greater issue. There is a trend to lower crew numbers, for example the Emma Maersk carrying 158, 000 tons of cargo has only 13 crewmen. Safe manning levels are important but some companies ignore the rules. The leisure yachting industry must be aware of these changes and take appropriate actions and learn from such incidents as the Ouzo.

Containers are a problem and sometimes fall off ships due to shippers overload containers, weather anomalies and more cargo now being carried on deck 7/8 high. Due to safety concerns in the USA stevedores are not allowed on containers to put locking devices in, so now new designs of lockshave to be introduced. Commercial pressures are very demanding and wanting everything today and cheap. Just in time deliveries to save warehousing causes many problems.

In conclusion we must have responsibility, accountability and a review of technology.
The third talk was given by Mr. James Stevens of the Royal Yachting Association on “Sailing a Risk Activity”

In the UK, there is no requirement for the skippers of recreational craft under 24m in length to be qualified or register their boats. Sailing involves risk which for many participants is an attraction. The sport has developed and become safer in many ways since 1979, when a severe storm resulted in 15 people losing their lives in the Fastnet yacht race. Fatalities per 100,000 vessels in the UK is only 1.5 and very much lower than many comparable countries.

Yacht design has improved, although there are still issues with keel structure. Crews are better prepared and have a better understanding of the hazards. The loss of the yacht Ouzo, although a rare type of accident, has highlighted the difficulties for ships in detecting yachts on radar. Even in poor visibility yacht/ship collisions are rare, yachts are more likely to collide with each other resulting in structural damage but rarely injury.

GPS (Ground Position System) has ensured that yachts rarely founder through uncertainty of position, although training in navigation is still essential.

Recreational boating is largely unregulated in the UK although breathalyser laws are being introduced. It is difficult to produce definitive statistics but there is evidence that boating in Britain is no more dangerous than in other countries where compulsory licensing and other laws have been introduced. Commercial yachting and sea schools in the UK are subject to a raft of legislation, some of which could be unnecessary.

It is essential for the health of the nation to encourage sport. With this comes risk, but this is considerably less than the dangers of unfitness and obesity.

The RYAs training programmes are recognised as a world leader and have an impact not only on safety but also provide a foundation for competitive success.

**AUTOMATIC PROSECUTION UNDER FIRE**

*Extract from Flight International 5-11 August 2008*

Proposals for global ‘just culture’ relating to incident reporting and incident investigation could be included in ICAO treaty
The International Civil Aviation Organisation wants to stop the automatic prosecution of pilots, air traffic control officers and other frontline staff following accidents or incidents. At present, automatic prosecution is standard practice in many in many states.

The organisation has prepared a working paper for its Accident Investigation and Prevention Group (AIG) meeting in Montreal on 13-18 October.

If the committee recommends the adoption of the paper’s proposals for promoting a global “just culture” relating to incident reporting and accident investigation, it will almost certainly lead to radical new additions to Chapter 13 of the ICAO treaty, which defines standards and recommended practices for accident investigation.

A “just culture” is a sophisticated concept for which an internationally accepted definition does not yet exist, so ICAO sees its first task as defining its characteristics.

Citing "an urgent need to establish an effective balance between the requirements for improving aviation safety and the requirements at national and international level for the administration of justice", the paper asks the AIG "to support and adopt for inclusion in annex 13 the description of a just culture".

It says: "A culture in which frontline operators or others are not punished for actions, omissions or decisions taken by them that are commensurate with their experience and training, but where gross negligence, wilful violations and destructive acts are not tolerated."

This definition, drawn up by Eurocontrol in conjunction with other aviation agencies, is already being promoted in the European Civil Aviation Conference states.

The working paper explains that a, just culture "will greatly facilitate the reporting and sharing of safety data as an essential contribution to enhancing safety in international aviation", and provides evidence that the criminal prosecution of those who have filed voluntary reports revealing mistakes that were often a product of an imperfect system, has resulted in the collapse of reporting systems in countries where the prosecution took place, creating a cover-up culture instead of a transparent one.

If adopted, the proposals would “urge states to adopt and implement just-culture principles” within their own laws.

Unusually, the paper proposes that, states go further than persuading the judiciary to implement changes to legal practices for the benefit of aviation safety; it encourages countries to "provide guidelines to aviation professionals on how to interact with the media, to achieve the right balance between providing relevant and accurate information to the public while preserving the needed confidentiality of individuals in the interest of aviation safety".

EUROPEAN CAMPAIGN ON RISK ASSESSMENT 2008-09

The European Campaign for Safety and Health at Work, formerly known as Euroweek, will this time be a two-year campaign focusing on risk assessment.

The UK's campaign, aimed at employers, workers, safety representatives and other stakeholders, will be officially launched in London on 24 June 2008. Full details of activities and downloadable tools and materials will be available on that date.

A number of nationwide events are planned for European Week itself on 20-24 October 2008.

ARTICLES IN THE NEXT ISSUE OF THE LOSS PREVENTION BULLETIN

The Loss Prevention Bulletin publishes safety articles and accident case studies in the process and chemical industry. Many of the articles are provided from anonymous publication and are therefore not available through other sources.

Issue 203, October 2008

TRANSPORTATION SPECIAL ISSUE

- Information for authors and readers
Learning from aircraft fuel tank explosions
A fatal accident involving a fork lift truck
Load securing while tipping containers
Tanker driver sustains injuries in a fall from the tanker
Offloading road tankers
Hazards in the maritime transport of bulk materials and containerized products
Book review
Bulletin briefing
Events

For further information on the Loss Prevention Bulletin, or to purchase articles online, please visit www.icheme.org/lpb

ARTICLES IN THE NEXT ISSUE OF PROCESS SAFETY & ENVIRONMENTAL PROTECTION

IChemE’s bi-monthly journal Process Safety and Environmental Protection covers all aspects of safety of industrial processes and the protection of the environment. The articles published, which are all peer reviewed, report research from around the world. Process Safety and Environmental Protection is the official journal of the European Federation of Chemical Engineering: Part B.

Below are the papers featured in Volume 86, Issue 5, Pages 313-396 (September 2008)

• Special issue – ECCE-6
  Pages 313-314
  Bożenna Kawalec-Pietrenko

Special Papers

• Harnessing methane emissions from coal mining
  Pages 315-320
  Krzysztof Warmuzinski

• Sustainable processes—The challenge of the 21st century for chemical engineering
  Pages 321-327

Gernot Gwehenberger, Michael Narodoslawsky

• Design of sustainable chemical processes: Systematic retrofit analysis generation and evaluation of alternatives
  Pages 328-346
  Ana Carvalho, Rafiquil Gani, Henrique Matos

• Structure and activity relationships for CO2 regeneration from aqueous amine-based absorbents
  Pages 347-359
  Prachi Singh, Geert F. Versteeg

• Evaluation of liquid bio-fuels using the Analytic Hierarchy Process
  Pages 360-374
  M.A. Papalexandrou, P.A. Pilavachi, A.I. Chatzimouratidis

• Contribution of knowledge management for the implementation of waste minimisation measures into process industries
  Pages 375-388
  A.P. Reyes-Córdoba, P.N. Sharratt, J.A. Arizmendi-Sánchez

• Enhanced treatment of practical textile wastewater by microbubble ozonation
  Pages 389-393
  Li-Bing Chu, Xin-Hui Xing, An-Feng Yu, Xu-Lin Sun, Benjamin Jurcik

Regular Features

• Recent Safety and Environmental Protection
  Pages 394-395

• Forthcoming Events
  Page 396

For further information on Process Safety and Environmental Protection, or to subscribe, visit www.icheme.org/journals or e-mail journals@icheme.org
ACROSS
1. Tedious chap in spy organisation returning from exercises. (7)
5. Last of all, out of carbolic another acid can be produced. (7)
9. Can a co-star be ordered to avoid scurvy? (9)
10. An alarming temptress. (5)
11. Like a prison cell, a hazardous place. (8, 5)
13. Mediterranean island contains nothing so useful as wood preservative. (8)
15. Use one to transmit manuscript on fashion. (6)
17. Mother returned to father in France, a physicist. (6)
19. The fish I catch is necessary for baby’s comfort. (8)
22. Share rejected after widening safety device. (9, 4)
25. Friend left a type of unsaturated alcohol. (5)
26. Frustrating kind of additive. (9)
27. Some heard rumours it could be perforated. (7)
28. Daily struggle as artist shows how to make a copy. (3, 4)
DOWN
1. Open a small container. (4)
2. Green exhortation concerning personal transport. (7)
3. An element of 5.ac. (5)
4. Blake called for one of fire. (8)
5. Accidents initially come from some unstable vessels. (6)
6. Current refuseniks. (9)
7. Mind about horse causing such slaughter. (7)
8. Need to scan altered state of vapour. (10)
12. Accede to an erratic hydrocarbon. (10)
14. Safety installation promoting garden growth. (9)
16. Equipment for getting a pig into 23. (8)
18. Well liked tree said to have another growing around it. (7)
20. Range of distillates unpalatable to moths. (7)
21. First man left least possible amount of old red mercuric sulphide. (6)
23. Otherwise a tiny portion of planet’s course. (5)
24. Cheese - British, that is. (4)

Answers to Crossword Puzzle No. 26 in Issue 37

Across
1. Short circuit
9. Induction
10. Erode
11. Screws
12. Prolific
13. Ripple
15. Condense
18. Creosote
19. Acidic
21. Breather
23. Diesel
26. Extol
27. Eliminate
28. Oxyacetylene

Down
1. Scissor
2. Odder
3. Tack welds
4. Iris
5. Cone roof
6. Ideal
7, 24. Confined space
8. Rescue
14. Prevents
16. Ductility
17. Etcetera
18. Cables
20. College
22. Telex
24. See 7 down
25. Fire
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<th>GROUP</th>
<th>TITLE OF MEETING</th>
<th>PLACE AND CONTACT</th>
<th>DATE</th>
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<tr>
<td>EPSC</td>
<td>Learning from Accidents</td>
<td>Tracey Hayward +44(0)1788 534409 e: <a href="mailto:thayward-epsc@icheme.org">thayward-epsc@icheme.org</a></td>
<td>9-10 October</td>
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<tr>
<td>S&amp;LPSG With NW Branch</td>
<td>Process Safety Performance Indicators</td>
<td>Preston, UK Gemma Jones e: <a href="mailto:gjones@icheme.org">gjones@icheme.org</a></td>
<td>16 October</td>
</tr>
<tr>
<td>ChemEng08</td>
<td>Health and Safety Session. Road Map Action Plans.</td>
<td>NEC, Birmingham, UK <a href="http://www.chemeng08.com">www.chemeng08.com</a> Sue Thomas, e: <a href="mailto:sthomas@icheme.org">sthomas@icheme.org</a></td>
<td>29 October</td>
</tr>
<tr>
<td>S&amp;LPSG With FABIG</td>
<td>Proposed joint meeting</td>
<td></td>
<td>December 2008</td>
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<tr>
<td>S&amp;LPSG With SONG SG</td>
<td>Energy Safety – New Challenges</td>
<td>UCL, London, UK Contact: Prof. Haroun Mahgerefteh, e: <a href="mailto:h.mahgerefteh@ucl.ac.uk">h.mahgerefteh@ucl.ac.uk</a></td>
<td>9 January 2009</td>
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<td>S&amp;LPSG</td>
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<td>Follow up to Buncefield Launch of IP 9 LPG Model Code of Practice</td>
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<tr>
<td>S&amp;LPSG Future Programme</td>
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Visit the Safety & Loss Prevention Subject Group website for further information regarding the groups activities, http://www.icheme.org/slp

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11
News alert 19 September 2008

IChemE and BP publish new animated safety lessons

IChemE and BP have teamed up to publish a new series of animations designed to aid safety learning through past incidents and experiences.

An extension of IChemE and BP’s successful book publishing venture, the animations can be used as standalone training modules or as supplementary material for safety courses.

The first trio of animations focus on an LPG storage-related refinery fire at Feyzin, France; a refinery explosion at Milford Haven, Wales; and a platform fire at Piper Alpha, a North Sea oil production platform. Each simulation focuses on a single incident or accident and follows the timeline of events from cause to effect.

Lee Allford, Operations Manager at the European Process Safety Centre welcomed the new series: “This is an excellent way for a high hazards site to draw on lessons from disasters which have occurred both in and outside the process industry.

“With a focus on management system failures rather than technical details, the series provides an absorbing account of several well known accidents which provokes the viewer to challenge their own safety methods and behavior,” added Allford, who is co-coordinating EPSC’s Learning from Accidents conference next month in Antwerp, Belgium where BP’s Frederic Gil is part of the speaker line-up.

The BP animations are available to purchase through the IChemE online shop, with prices starting from £12.00. The animations are embedded in PowerPoint files and require FlashPlayer to run. Individual purchases and licences for training purposes are also available. Discounts apply for customers purchasing more than one animation.

ENDS

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Email: mstalker@icheme.org