



Safety & Loss Prevention
Subject Group

IChem^E

Newsletter

EDITORIAL:

The new committee officers of the S&LP Subject Group are:

Dr. Mike Considine – *Chairman*
Mr. Allen L. Ormond – *Treasurer*
Mr. Gus Carroll – *Secretary*

Universities are being slow to take advantage of the Accident Database and to use it in the design project. At present the following universities have copies:

Belfast University
Loughborough University
Queensland University
Slovenia University
Strathclyde University
University College London

Where are the other universities?

The next AGM and Committee Meeting will be held at IChemE, Gayfere Street on 7 September 2000. If anyone is interested in joining the committee, nominations should be sent to Gus Carroll at Yule Catto & Co Plc, Group HSE Manager, Temple Fields, Harlow, Essex, CM20 2BH.

Tel: 01279 459538, Fax: 01279 422271,
Email: gus.carroll@yulecatto.com.

John Bond, April 2000

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SAFETY IN DESIGN PROJECT PRIZE

The S&LP Committee, at their recent meeting, agreed to sponsor an award of £250 for the best safety section of the Design Project submitted by a University Chemical Engineering Department.

For details contact John Picken at the Institution.

INTERNET CONTACTS

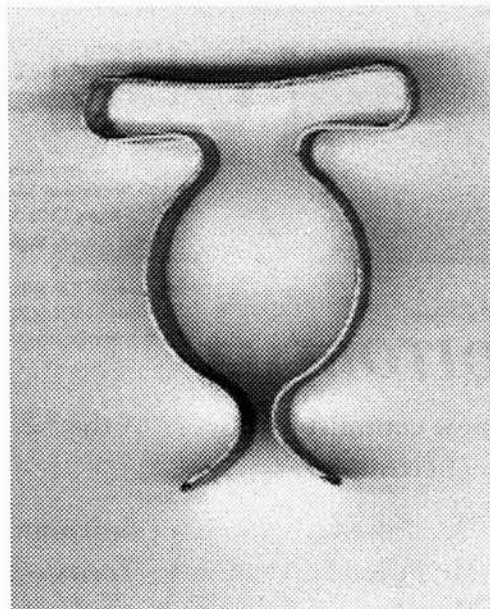
The HSE has made the COMAH Safety Report Assessment Manual available on the internet at www.hse.gov.uk/chid/comah2 . This is supplemented by the by the HSE Guidance publications, particularly HSG 190 ‘Preparing Safety Reports’.

“Guidance on the Interpretation of Major Accidents to the Environment for the Purposes of the COMAH Regulations” is given on www.environment.detr.gov.uk and is available from the Stationery Office.

Information as to how the Environmental Agency assess Environmental Risk aspects of Safety Reports can be obtained from “Guidance on the Environmental Risk Assessment Aspects of COMAH Safety Reports” on the web site www.environment-agency.gov.uk and clicking on COMAH guidance.

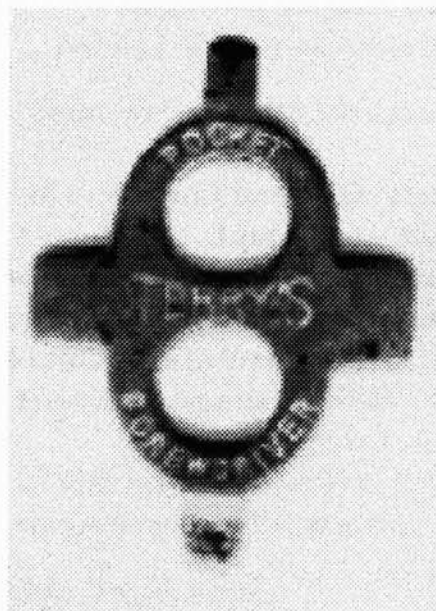
THE TERRY CLIP

The Terry clip, used in association with the parachute harness, is shown below.



Another ex RAF pilot has contacted me and has said that he had the Terry clip with his harness when flying Meteor Jet Fighter.

The inventor of the clip also invented the pocket screw driver, given below, that many of us have on a keyring or, in my case, in the pouch of items that I have to solve any difficulties I have at the hotel.



1 + 1 = > 2

Two of the papers presented at the AIChE Annual Loss Prevention Symposium in April 2000 show that in process safety, if there are two (or more) independent hazards in the same plant, the results can be greater than the sum of the individual hazards.

Robert Zalosh's paper, "A Tale of Two Explosions", starts with the words, "It was the best of times; it was the worst of times. The economy was booming; some of the booms were due to plant explosions."

The first occurred in one of the power station boilers in Ford's Dearborn, Michigan factory in February 1999. The primary fuel was pulverized coal but natural gas was also used. Two supply lines each supplied three burners. The boiler was shutting down for overhaul. One of the natural gas lines was isolated and slip-plated; the valves after the slip-plate were opened and the line swept out with nitrogen. The other line had not yet been slip-plated but it seems that the valves in this line were also opened, in error, at about the same time (and some of them may not have been closed). Gas entered the furnace. *There were no flame-sensing interlocks to keep the valves closed when there was no flame* and after one and half minutes an explosion occurred. The ignition source was probably hot ash. The explosion inside the boiler set off a secondary explosion of coal dust in the boiler building and in neighbouring buildings. Six employees were killed and many injured. Damage was estimated at one billion dollars, making it the most expensive industrial accident in US history.

There were thick accumulations of coal dust in the damaged buildings. Even after the explosions the dust was an inch thick. On many occasions a primary explosion has

disturbed accumulations of dust and resulted in a far more damaging secondary explosion. The hazards of dust explosions and the need to prevent accumulation of dust are well-established; John Bond has often quoted a 1785 example. Henry Ford is reputed to have said that history was bunk. Did they still believe that in Dearborn in February 1999?

The second explosion in Zalosh's paper was also a furnace explosion, killing three employees, also in February 1999. There seems to have been a flame-out and, as in the first incident, there were no flame-sensing interlocks to close the fuel gas valves when flames went out. In addition, one fuel gas valve was leaking. As in the first incident, the primary explosion disturbed dust, resin this time, and caused a secondary explosion.

The other paper, "Explosion and Fire at Powell Duffryn Terminals, Savannah, Georgia", by David Chung, described an explosion in 1995 in a low pressure storage tank, one of three, each containing about 800 m³ of crude sulphate turpentine, an impure recovered turpentine with an unpleasant smell and a flash point that can be as low as 24°C. The turpentine was moved into the tanks some weeks before the protective equipment was fitted.

To prevent the smell reaching nearby houses the vent gases were to be absorbed in a carbon bed. This was not kept wet, as instructed by the manufacturers, got too hot and ignited the vapour. The explosion occurred on the first day that the system was in full working order. During the day the oxygen content in the tank was low but rose in the evening when the tank got cold and air was sucked in.

The explosion spread to the other two tanks as through the common vent collection system the flame arrestors due to be fitted in the vent lines had not been delivered.

The explosion damaged three other tanks in the compound. One contained an acidic liquid and another an alkaline liquid. The two reacted and produced hydrogen sulphide. Incompatible liquids should not be stored in the same bund.

There was a fixed foam fire-fighting system on the tanks but it was unusable as the piping connection outside the bund had not been installed.

What, I wonder, were the qualifications, abilities, knowledge and experience of the people in charge of the three plants involved in these incidents?

Trevor Kletz

HELL'S FIRE

*The Safety Inspector's next aim
Was to find out why Hell was aflame:
Did its management make
A disastrous mistake?
Or was auto-ignition to blame?*

“REFORMING THE LAW ON INVOLUNTARY MANSLAUGHTER: THE GOVERNMENT’S PROPOSALS”

This booklet is available free of charge from the Home Office Gerry Ranson – 020 7273-2291.

It is also available on the Internet at <http://www.homeoffice.gov.uk/index.htm>.

This booklet describes the need for reform and the proposals for:

- Reckless Killing
- Killing by Gross Carelessness
- Corporate Killing

A draft bill is given in the booklet and questions raised. Answers to the questions and views are requested.



HSE GUIDANCE BOOKLET ‘DESIGNING AND OPERATING SAFE CHEMICAL REACTION PROCESSES’

This booklet is now available price £12.50. I had some difficulty in ordering it and had to go to the Help operator.

CALL FOR PAPERS

JOINT IChEME AND RSC HEALTH, SAFETY AND ENVIRONMENT MEETING

The annual joint IChemE and RSC Health, Safety and Environment meeting will be held on 5 December 2000 at the Geological Society Lecture Theatre, Burlington House, London.

The theme of the event is *From the Micro to the Macro – the Safety Issues of Scale Up*. All papers to be presented orally. If anyone would like to make a contribution to this seminar by giving a presentation then please submit an abstract of approximately 300 words to Sue Barnett at IChemE, tel 01788 578214, email sbarnett@icheme.org.uk

BOOK REVIEW

*(Reprinted with kind permission of
The Hazard Forum Newsletter)*

Title: *The Southall Rail Accident
Inquiry Report*
Author: Professor John Uff QC, FREng
Publisher: HSE Books
ISBN: 0717617572
Price: £19.50
Pages: 226 plus annexes

The Southall rail accident occurred on the 19th September 1997. It involved a collision between a high-speed train (HST) and a freight train, which was crossing the main line. The estimated speed of the HST at impact was 60-80 mph, while the freight train was travelling at 21-25 mph in the opposite direction, giving a relative speed in excess of 80 mph and probably in excess of 90 mph.

There was a whole chapter of events leading up to the disaster. Inadequate supervision of maintenance at the Old Oak Common Depot led to the Automatic Warning System (AWS) on the leading power car of the HST being on the blip when it arrived at Paddington for the service to Swansea. As a consequence the AWS, on what was to become the rear power car, was isolated. The Rule Book, issued to operating staff, including Drivers, revealed an appalling lack of clarity on what precise action should be taken if the AWS was isolated. It was clear, however, that it should have been reported to the Signaller, but this was not done.

The AWS, in what was now the leading power car, was working on the outward run to Swansea. At Swansea no attempt was made to rectify the defective AWS, or to turn the train end for end, which was quite feasible. As a result the AWS was isolated. Though the HST was fitted with Advanced Train

Protection, ATP, neither of the two Drivers who operated the service that day was qualified to use it, so it was switched off. As a consequence the train left Swansea on its return journey with no train control system in operation. Again it appears that the Signaller was not warned.

At Cardiff there was a change of Driver, and it could be questioned whether the second Driver should have been prepared to operate the service, and if he should have informed the Signaller. The HST approached Southall travelling at 2 miles per minute. The Driver's attention was distracted; perhaps he was packing his bag prior to going off duty on arriving at Paddington, or he suffered a lapse of concentration, which is referred to as 'micro sleep'. Whatever the cause he did not observe the double yellow or single yellow signal. When he regained his attention he observed the red signal ahead of him, and a quarter of a mile in front of it a goods train crossing the track. He applied the emergency brakes and realising that a collision was inevitable, he wisely retired to the rear of the power car, where he survived the crash. Unfortunately seven passengers were killed and very many more were injured, some very grievously.

In the crash the side of the second passenger coach was severely weakened by a sharp edge on one of the wagons, which greatly reduced its transverse strength. When this coach impacted a stanchion carrying the overhead power lines, it was nearly bent double. Otherwise the coaches stood up remarkably well to this horrendous crash.

It is too simple to put the whole blame for this accident on the Driver, or the inadequate organisation of maintenance of the

AWS, or the dragging of feet over the introduction of ATP, or the confusion caused by the Rule Book which had grown uncontrollably over the years, or the lack of adequate training of Drivers. Perhaps the essential problem was the fragmentation of the railway following privatisation, which led to a host of new companies, contractors, sub-contractors and individuals working on the railways, some of whom had little or no railway experience. This led to an explosive growth of safety-related paper work. Perhaps it must be recognised that paper work alone is not enough to ensure safety, indeed it may well form an additional hazard, as it is possible to trip over it. What is important is to ensure that the essential recommendations contained in the paper work are fully implemented, and that a safety culture permeates throughout the entire organisation; these are the responsibility of management.

The chapters devoted to 'Conclusion' and 'The Lessons to be learned' should be mandatory reading for all engineers and managers. The report would form an excellent case study for the course 'An Engineer's Responsibility for Safety', which is being promoted by the Hazards Forum. Despite every effort, including the publication of the lectures which form part of this course, the Engineering Council and many of the engineering institutions are dragging their feet in making the course a mandatory requirement for accreditation of engineering degree courses. Perhaps if they read this report they might see the importance of taking action now.

**Professor Sir Bernard Crossland
CBE, FRS, FREng**

NEWS BRIEF

ACCIDENTS

Gnome causes accident. (*The Guardian 17 May 2000*)

A jealous boyfriend was injured when a garden gnome he threw at a window of his former partner's house bounced back and hit him on the head.

OFF-THE-JOB SAFETY

BP Amoco has extended the defensive training course that all fleet drivers take to all of its 19,000 staff. The course, IAM Fleet Training, is a one day course.

The European Process Safety Centre's 3rd international conference (November 16th in Brussels) will focus on safety issues associated with the changes currently underway in the process industries. The conference is called "Safety issues in a dynamic business environment" and presentations will be given by senior managers from industry and consultancies specializing in the corporate and site level management of change issues. A small exhibition will run alongside the event and providers of safety-related services who would more information on this marketing opportunity should contact Alison Schaal at EPSC's Rugby office on tel: 01788 534409 or email aschaal-epsc@icheme.org.uk for stand details.

For information about any of S&LPSG meetings shown on the back page, please contact the IChemE's Subject Group Officer:

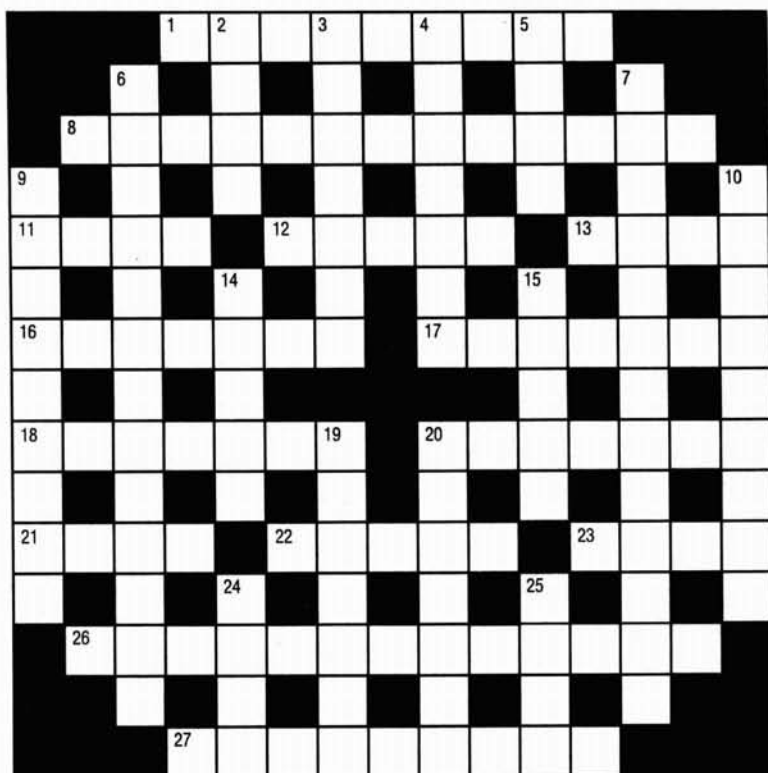
John Picken, IChemE

Phone: 01788 578214

Fax: 01788 560833

E-mail: jpicken@icheme.org.uk

CROSSWORD PUZZLE No. 6



ACROSS

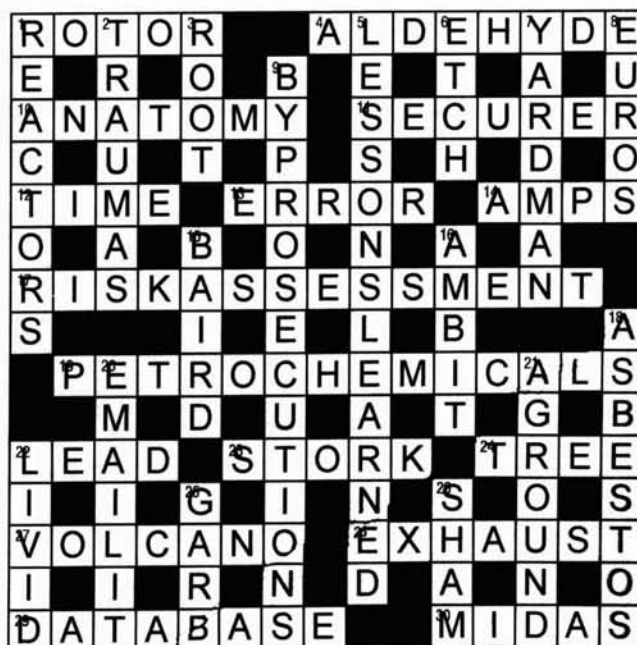
- 1. Guard alternative - Cromwell was a lordly one. (9)
- 8. Fresh yeast's an antidote to dropping off. (6, 7)
- 11. Sounds like a fault in Welsh pipework. (4)
- 12. Wrongdoer not in a continental house. (5)
- 13. Travel allowance includes an airline. (2, 2)
- 16. You can be locked up for having half a joint. (7)
- 17. Underwrite a backer. (7)
- 18. Vaulting caused a fresh chagrin. (7)
- 20. But the Old Testament character wasn't a nasty piece of work! (1, 3, 3)
- 21. Fifty help to be put down. (4)
- 22. Jump around the alphabet and make an essential investigation. (5)
- 23. An exam in morality. (4)
- 26. Possibly a machine is not what the Luddites feared. (13)
- 27. The 'Ome Guard were great ones - 'ear, 'ear. (9)

Answers will appear in the next issue.

DOWN

- 2. Right fish to wind in. (4)
- 3. Scottish region that saw a disastrous collapse. (7)
- 4. Cribs for high-up employees. (7)
- 5. Has queer snow. (4)
- 6. We all hope our GPs belong to them. (4, 9)
- 7. Speak plain English about a futile joule of arc-welding gas. (7, 6)
- 9. It used to be inflammable. (9)
- 10. Could be an all marble tocsin. (5, 4)
- 14. A number do this in the garden. (5)
- 15. The point of a multi-storey blow-out. (5)
- 19. At last she has her own flat. (7)
- 20. Caroused topless. (7)
- 24. A safety one will keep you on your toes. (4)
- 25. Mix-up in prison. (4)

ANSWERS TO No. 5 CROSSWORD PUZZLE



FORTHCOMING MEETINGS OF SUBJECT GROUPS AND OTHER MEETINGS OF INTEREST TO THE SAFETY AND LOSS PREVENTION SUBJECT GROUP

Group	Title of Meeting	Place & Contact	Date
British Institute of Non-Destructive Testing	NDT 2000	The Palace Hotel, Buxton Phil Kolbe infor@bindt.org	12-Sep-00
IChemE 3 one-day Courses	Screening and characterisation of exothermicchemical reactions Process scale-up and relief sizing Explosion hazards of dusts and vapours	Borehamwood Tracy Lepkowska 01788-578214 tlepkowska@icheme.org.uk	12/14-Sep-00
Safety and Loss Prevention Subject Group (IChemE)	Occupied Building Assessments	Foster Wheeler, Reading John Picken 01788 578214 jpicken@icheme.org.uk	21-Sep-00
IChemE 3 day Course	Applied Hazard and Operability Study	Leeds Tracy Lepkowska 01788-578214 tlepkowska@icheme.org.uk	25/27-Sep-00
IChemE 4 day Course	Introduction to hazard analysis and risk assessment	Sheffield Tracy Lepkowska 01788-578214 tlepkowska@icheme.org.uk	25/28-Sep-00
Suregrove Ltd	Applied Risk Management in the Process Industries	London Reg Canaway 01737 813605	9/10-Oct-00
IChemE Course	Assessment and control of electrostatic hazards in industry	Leeds Tracy Lepkowska 01788-578214 tlepkowska@icheme.org.uk	10-Oct-00
IMechE	Radioactive Waste Management 2000:- Challenges, Solutions and Opportunities	IMechE, London Anna Chapman a_chapman@imeche.org.uk	18-Oct-00
IEE	Young Engineers Commercial Awareness Workshop	Highgate House Conf Centre, Nottingham Katherine Hardman khardman@iee.org.uk	20-Oct-00
IChemE 4 day Course	Design for Safe Handling of Industrial Chemicals	University of Sheffield Sophie Wilson 01788 578214 swilson@icheme.org.uk	23/26-Oct-00
IChemE 4 day Course	Hazards in Process Plant Design and Operation	University of Sheffield Sophie Wilson 01788 578214 swilson@icheme.org.uk	30-Oct/2-Nov-00
IChemE 4 day Course	Hazop study for team leaders/team members	Manchester Tracy Lepkowska 01788-578214 tlepkowska@icheme.org.uk	31-Oct/3 Nov-00
EPSC	Safety issues in a dynamic business environment (includes exhibition)	Brussels Jennie Black 01788 578214 jblack@icheme.org.uk	16-Nov-00
South Wales Branch (IChemE)	Safety Risks: the industry vs the public view	Solutia UK, Newport Mike Lynham, mwlyneham@solutia.com	21-Nov-00
IChemE 4 day Course	Process Plant Reliability & Maintainability	University of Sheffield Sophie Wilson 01788 578214 swilson@icheme.org.uk	27/30-Nov-00
Safety and Loss Prevention Subject Group (IChemE)	Demanning and outsourcing - the implications for safety in an organisation	DNV, London John Picken 01788-578214 jpicken@icheme.org.uk	29-Nov-00
Society of Loss Prevention, Singapore	3 rd International Conference on Loss Prevention	Pan Pacific Hotel, Singapore Conference Secretariat nancy@slp.org.sg	4-Dec-00
Joint IChemE and RSC Health, Safety and Environmental Meeting	"From the Micro to the Macro - the safety issues of scale up"	Sue Barnett IChemE 01788-578214 sbarnett@icheme.org.uk	5-Dec-00
British Nuclear Energy Society & British Nuclear Industry Forum	Nuclear Congress 2000	London Sue Frye, frye_s@ice.org.uk	6-Dec-00
AIChE	35 th Annual Loss Prevention Symposium (incorporating the 5 th Bi-Annual Process Plant Safety Symposium)	Houston, Texas, USA Dennis Hendershot Dennis_C_Hendershot@rohmmaas.com	22-Apr-01
EFCE & The Royal Swedish Academy of Engineering Sciences	10 th International Symposium on Loss Prevention and Safety Promotion	Stockholm, Sweden Conference Secretariat LP2001@stocon.se	19-Jun-01
EFCE	3 rd European Congress of Chemical Engineering	Nuremburg, Germany Christina Hass, ECCE@dechema.de	26-Jun-01
Institution of Chemical Engineers in Australia	6 th World Congress of Chemical Engineering	Melbourne, Australia Meeting Planners chemeng@meetingplanners.com.au	23-Sep-01
North West Branch (IChemE)	Hazards XVI – analysing the past; planning the future	UMIST, Manchester Mike Adams, mike.j.adams@talk21.com	6-Nov-01