Safety & Loss Prevention Subject Group

S&LPSG

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Newsletter

SAFETY & LOSS PREVENTION NEWSLETTER CONTENTS LIST

Correspondence to :

John Bond
25 Canonsfield Road
Welwyn, Herts, AL6 0PY

Phone: 01438 717253
Fax: 01438 717253
e-mail: johnbond@cwcom.net
Website: http://www.slp.icheme.org

FROM THE EDITOR:

The year 2000 has now started and this is issue 13, what will it bring? Looking back at the start of the second millennium, with the help of Nash's *Darkest Hours* you will appreciate, I found that:

1004 English famine
1007 Earthquake in Deinar, Turkey 10.000 killed
1012 Danube and other rivers flooded.
1036 Vesuvius erupted with great paths of lava

But if we look at the turn into the 20th century we have a most interesting disaster at Hoboken, New Jersey on the 30th June 1900:

Smouldering bales of cotton stacked along the wooden pier ignited one hundred barrels of whiskey (*thank goodness it was not Scottish malt whisky*) which then set fire to four leading passenger ships, eighteen lighters, canal boats and barges. The pier was destroyed but was rebuilt in steel. 326 people were killed.

In 1903 the Earl of Ilchester was fined £3 for speeding more than 13 mph in his car.

For me 1999 ended with an IBC Conference on Accident Investigation where I gave a paper on how an Accident Database could assist in the investigation of an accident. There was great support for the concept of sharing information and one person even

suggested that the forthcoming accident investigation regulations should encourage the sharing of information. A barrister and a solicitor gave two very interesting papers. Both pointing out that fines for violation of health and safety regulations were increasing.

Both have pointed out that the Court of Appeal case of R *v* F.Howe and Son (Engineers) Ltd. in 1998 resulted in views being expressed on fines and sentencing guidelines. In determining the level of a fine, the court had to consider the need to hurt the organisation and the shareholders. Mitigating factors could include a prompt admission and plea, steps to remedy the deficiencies and a good safety record.

After the conference I asked if sharing accident information with others persons to help prevent accidents could be a mitigating factor and it was agreed that it would be a strong factor.

The HSE Press Release E233:99 dated 22 November 1999 states that they are to pursue an active policy of naming companies that flout health and safety law. The HSE will publish a special annual report which will name the companies convicted in the past 12 months. These names will also be listed on the HSE's Internet website.

Yes the year 2000 should be interesting.

John Bond, January 2000

ACCIDENT INFORMATION ON THE INTERNET

Bretherick's Handbook of Reactive Chemical Hazards on-line demo version **http://www.bretherick.com.uk**

European Agency for Safety and Health at Work. Provides access to European and international safety and health information on key issues such as legislation, research and good practice. **http://osha.eu.int**

Chemical Safety and Hazard Investigation Board (CSB) is an independent federal agency whose mission is to ensure the safety of workers and the public by preventing or minimising the effects of chemical incidents at industrial facilities. **http://www.chemsafety.gov.usa**

A recent fire at a refinery in Thailand is described on the internet at http://www.bangkokpost.com.

DO YOU HAVE ANY MORE TO SHARE WITH OTHERS?

HOW ABOUT THIS INVENTION!

UNITED STATES PATENT OFFICE

Suspenders

Specification forming part of Letters Patent No. 323416, dated August 4th 1885. Application filed February 3, 1885. (No model)

... My invention relates to improvements in suspenders, having for its object to provide a suspender with a chord so secured thereto or formed therewith as to constitute a part of the same, and to be readily and easily detached therefrom, whereby, in the event of a person being confined to a burning building and having all of the usual means of escape cut off, the chords can be disengaged from the suspenders and lowered to the ground to receive a rope, and thus enable the person to effect his escape..

WHEN IS A FLAMMABLE GAS NOT FLAMMABLE?

Some 50 years ago a new design of a refinery unit was installed to isomerise butanes. The catalyst had to be activated by adding substantial amounts of anhydrous hydrogen chloride to the charge. A fractionator removed the hydrogen chloride from the product and recycled it.

The equipment was all mild steel so it was clear that at the first shutdown a steam purge, which was normally used for purging hydrocarbons from pipework or vessels, could not be used to remove the butanes and hydrogen chloride. Instead it was decided to use nitrogen which was to be supplied from cylinders, as bulk supplies were not yet available.

When the fractionator had been purged, the bottom manway was opened, a long sample probe inserted and the vapours checked with a standard flammable gas detector. A zero reading was obtained.

Fortunately someone realised that in the absence of oxygen no combustion could occur on the sensor of the flammable gas detector regardless of the amount of hydrocarbon present. Further testing confirmed that butane was still present and further purging with nitrogen was necessary before the fractionator could be opened up safely.

Lesson.

1. Flammable gas meters cannot be used immediately after nitrogen purging as there will be no oxygen present for the sensor to react correctly.
2. Whenever something new and innovative is being tried it is important to check carefully whether well proven safety procedures are still applicable.

Ian M. Dugaid

HAZARDS XV: THE PROCESS, ITS SAFETY AND THE ENVIRONMENT - GETTING IT RIGHT

4th-6th April 2000, UMIST, Manchester-I.Chem.E NW Branch

KEYNOTE PAPER BY PROFESSOR T.A.KLETZ

This, the latest in the series of Hazards symposia, brings together experts and practitioners from the fields of process safety and environmental protection to present and discuss their work, and to try to identify areas where common solutions can be found or where there are conflicting priorities.

Case studies and the results of accident investigations will be presented, as will research efforts into understanding and predicting safety and environmental risks.

The recent COMAH Directive from the European Union is one of the driving forces behind this symposium, and papers will be given on Occupied building studies, and the early findings by the HSE on safety reports submitted to date.

Applications for programmes to:

M.J. Adams, Rawgreen, New Hutton, Kendal, Cumbria, LA8 0AS

Tel/Fax: 01539 732845
E-Mail: mike.j.adams@talk21.com

DO WE EVER LEARN LESSONS - THE CASE OF THE 50P CLIP?

In 1941 I was evacuated with my school to Pitlochry in central Scotland and joined the Air Training Corp in 1942. Our high days were visits to the Fleet Air Arm station at Arbroath, where we could get flights in a Swordfish. In those happy-go-lucky days these open cockpit aircraft were appropriately called 'String-Bags' - on one occasion we took off with the low engine oil pressure warning light showing red, but our pilot blithely announced that it was usually the electrics that were wrong! But I digress.

We were instructed in the use of a parachute, including the fitting of its harness. The four straps (one over each shoulder and two between the legs) had to be snapped into a buckle positioned over the stomach. This buckle had a large circular aluminium knob, and should it be necessary to bale out this knob had to be rotated to the left and struck inwards just after reaching the ground. This action would release the buckles of the harness straps and free the parachute so that it would not drag us with it if there was a strong ground wind.

However, it seems there had been a case of an airman accidentally rotating this knob on the buckle and knocking it on a piece of the aircraft while climbing out of the cockpit. The release of the harness and parachute while baling out had, of course, a tragic consequence. Subsequently a clip was adopted (similar to one used to hold a broom stick against the wall of a garage and called, I believe, a Terry clip), attached to the harness by a piece of string. It was explained to us that this clip was to be kept underneath the aluminium knob so that even if the knob was rotated accidentally while, say, turning round in the cockpit, the clip would prevent the knob from being struck in and releasing the harness and parachute prematurely. The clip, of course, had to be pulled from behind the knob just before reaching the ground. This Terry clip and its purpose made a distinct impression on me, as in the open cockpit of a Swordfish you could easily imagine a free fall without a parachute, especially when the aircraft made a sharp banking manoeuvre. I made quite sure that the clip was always in place.

But time moved on and in 1986 *Flight International* carried a report of an RAF instructor falling out of his parachute harness after baling out. This prompted a reader to describe a similar case, of which he had personal experience, of a pilot ejecting from a Hunter Mk2 some thirty years previously and shedding his parachute. This accident, in 1956, had been attributed to the pilot not fitting his harness correctly. However, it was proved shortly afterwards that in the cramped position of a pilot in a Hunter the quick release knob could be rotated merely by rubbing on clothing, and on climbing out of the aircraft the knob could easily be knocked and the harness with the parachute released. To prevent this, the RAF had come up with a modification to the harness - a clip similar to a Terry clip, no less. Attached to a cord stitched to the harness.

Thus was an accident prevention system, certainly in use in 1942 but evidently discarded somewhere along the way, re-invented in 1956. In view of the 1986 fatality, one is tempted to think that the 1956 re-incarnation of the simple clip has gone the way of the 1942 version.

Despite modern G-suits, ejector seats, etc., does the Terry clip need re-inventing yet again? Have any of our ex-Fleet Air Arm or ex-RAF readers any views?

Dr. John Bond

QUOTE CORNER

"We live in the present, we dream in the future and we learn from the past"

Madame Chang Kai-Shek

THE ESSO LONGFORD GAS PLANT ACCIDENT

Report of the Royal Commission

The investigation of the Victoria, Australia accident, that left the state of Victoria without gas for many weeks, is available on a CD-ROM from Australia. It contains the complete report in Adobe PDF format using Adobe Acrobat version 4 which is contained on the disc. There are 2 copies of the 290 page report. The viewing copy is available at 75 dpi version while the printing copy is 600 dpi. The contents of the report are:

1. Introduction
2. Longford process, organisation etc
3. The Accident
4. The effect of the explosion
5. Technical analysis
6. Metallurgical analysis
7. The fire, explosion, response to emergency
8. Loss of gas supply
9. The restart
10. The supply of ethane to the petrochemical industry
11. The hydrate incident
12. The cold temperature incident
13. Management systems
14. The regulatory environment
15. Conclusions and recommendations

Appendix 1 The functioning of the commission

Appendix 2 GPI isolations to gas plant 1

Appendix 3 Process flow diagram for GP1 and interconnecting units

References

List of abbreviations

List of figures

List of tables

The Big Bang

The Safety Inspector was sent
To look at the Big Bang event
He pondered for days
On the question to raise
"Was it really an accident?"

WIND LOADING ON STRUCTURES

At Greenwich Observatory there is a Time Ball which falls down a vertical shaft precisely at 1.00 pm each day. This was installed in 1833 to give mariners the correct time for setting their chronometers before starting off on their journeys. This was essential for calculating their longitude position.

On the 6th December 1855 a winter gale blew down the Time Ball from the roof of the Greenwich Observatory into the courtyard. Hubert Airey, son of the Astronomer Royal Sir George Biddell Airey painted a water colour picture to record the incident. The original Time Ball was covered in leather but this was replaced in 1919 by the present aluminium one.

Was this a portent that Sir George Airey should have noted before declaring that the design air pressure loading on the Tay Bridge would be satisfactory at 10 lbs per square foot? In 1879 the Tay Bridge blew down. Fortunately the Tower Bridge in London, opened in 1894, was designed for a loading of 56 lbs per square foot.

NEWS REPORT

Firm's Directors Convicted over Fatal Crash

(The Times 20 November 1999)

Two company directors were found guilty of corporate manslaughter after ignoring the excessive working hours of one of their drivers who fell asleep at the wheel and caused a fatal crash. The jury decided that the senior managers of a haulage firm were partly responsible for the crash in which two people died. The directors were accused of being "grossly negligent" in allowing the driver to spend more than 60 hours a week at the wheel, breaking the law on driving hours. They were convicted of two charges of manslaughter after the court was told that they knew, or should have known, that the driver was in a "dangerously exhausted state". The driver pleaded guilty to causing death by dangerous driving.

On Friday 10th December the driver was sentenced to 30 months in prison. The two directors were given a suspended sentence.

Refinery Fire at Laem Chabang, Thailand.

The fire started in a tank containing 1.5 million litres of petrol where there was an explosion late on Thursday night 2nd December, and spread to engulf three other tanks containing a total of 26 million litres of fuel. Two security guards, a refinery employee and a fireman were killed and 14 others injured. The blast damaged parked cars and fire engines and shattered windows in nearby buildings and houses. The Thaioil managing director said 5,000 litres of foam had already been used and another 10,000 litres were ordered from local distributors. Further foam supplies were being flown in from Singapore.

LESSONS I DID NOT EXPECT TO LEARN. NUMBER 3

Not all lessons come from formal presentations. Martin Pitt, University of Sheffield, continues his observations on educational experiences gained while attending S&LPSG meetings, but which were not part of the programme!

I noticed that my (electric) watch had stopped, but it started again when I tapped it. I decided that the battery needed replacing, the contacts were dirty or the watch was nearing the end of its life, or possibly all three, and resolved to get a new one at the earliest opportunity. I set the time correctly. Family matters intervened, and I set out later than I would have wished to get to a meeting. Traffic was also heavier than I would have liked and there was an epidemic of cones on the motorway.

With 30 miles to go, I stopped to check the map. I looked at my watch and was pleased and surprised to see that I had nearly an hour to get to the meeting. Then I looked at my car clock, which read some forty minutes later. Which was more likely - my wristwatch had stopped or my car clock had jumped forward? And which should I believe? What happens when two instruments disagree? (Remember the film 'The China Syndrome' in which one level gauge was stuck in a high position and no-one noticed the other one which dropped to low level when water was dumped from the reactor?)

The answer is that I arrived just in time, because my watch was correct and the car clock had indeed jumped forward for some reason. (This happened on one further occasion with this car, but I do not know why.)

The second lesson was that despite this, I should take no action, which is a hard thing to do under stress. If the car clock was true, I had 20 minutes to make 30 miles which was impossible. I was already expecting to go at 70 mph on the motorway, so there was nothing I could legally, safely or even usefully do to get there on time. The only thing was to carry on safely (which is what I did) and be resigned to missing the opening presentation (which in fact I did not). Even if I had thought I had (say) 40 minutes, it would not have been worth taking any risk at all (to myself and others) by speeding. The meetings are good, but not worth risking your life!

I drew two lessons from this, but the second one took quite a long time to dawn upon me. Firstly, faced with a conflict between two instruments, I was right to believe the one that was both more likely and more pessimistic.

If

(With apologies to Rudyard Kipling)

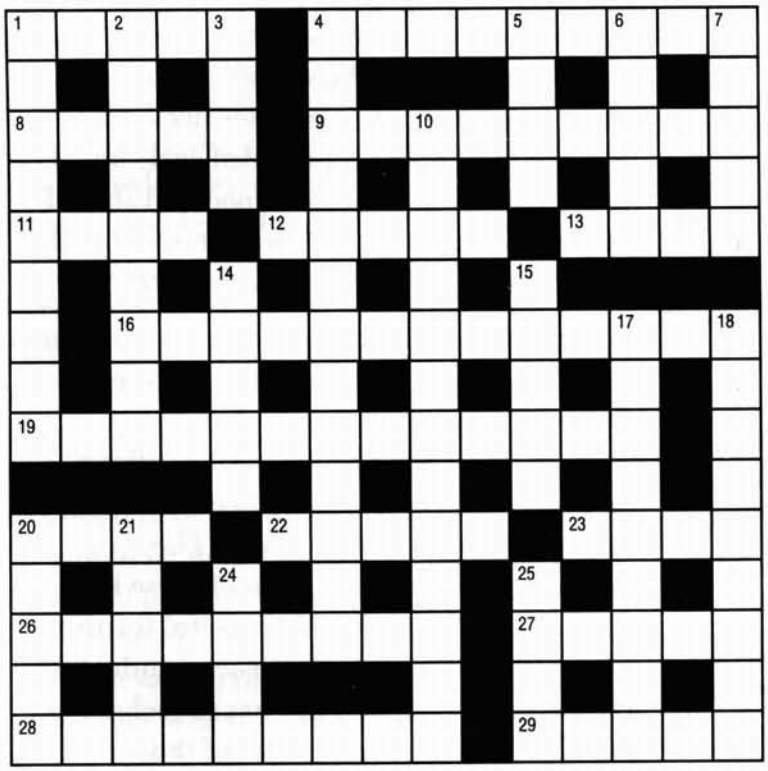
If you can keep your cool when all above you
Are choosing hairs to split on safety rules;
If you can stand your ground with none to love you
But make allowance for some stubborn mules;
If you can plan a safer plant by showing
A system of controls without a flaw,
And having done it don't give way to crowing
As if there's no such thing as Murphy's Law.

If you can scheme and make your schemes work faster;
If you can shrink from resting on your oars;
If you can meet with Near Miss and Disaster
And never sleep until you've found the cause;
If you can dare to cheer the whistle-blower
For pointing out bad practice on a site
And watch the mishap numbers getting lower
Without suspecting fiddles left and right.

If you can take one peep at all your data
And spot which safety lessons you can learn,
And having learned them start to operate a
System where the hazards can't return;
If you can put your records on a floppy
To serve your firm long after you have gone,
So if and when the HSE gets stroppy
There's little else to do except log on.

If you can talk with staff on ALARP theory
Or hob with nobs and keep your doctrine plain;
If making risk assessments cannot weary;
If all risks count with you and none in vain;
If you can get a safety culture growing
And share whatever lessons you have learned;
Yours are all the safety plaudits going
And - which is more - you'll know they've been well earned!

Crossword Puzzle No. 4



ACROSS

1. The wider its margin the better for safe practice. (5)
2. One Parliamentarian with old gin cocktail can cause a nasty incident by bursting in. (9)
8. Foot that has to step with caution. (5)
9. All aboard for corporate responsibility. (9)
11. The duty is ours. (4)
12. Crazy if loose - needs a driver. (5)
13. Comes to a sound but colourful end. (4)
16. Did Ferranti trade otherwise than in biphenyl? (4, 9)
19. Hardly a scheme thought up in a crisis! (9, 4)
20. Some earth is underdone. (4)
22. How a brace of peacocks walk. (5)
23. The scales snap back. (4)
26. No point in a safety harness if it isn't somehow unblocked. (7, 2)
27. French friend denies making acid. (5)
28. Where would the jet set be without it? (5-4)
29. A safe 22 must be icy cold and topless. (5)

Answers will appear in the next issue.

DOWN

1. Show with fifty in the first half and four in the second. Should go with a bang. (9)
2. Health and Safety Executive returns in fancy neckwear to change everything round. (9)
3. Röntgen knew all about these fish. (4)
4. Oddly, I didn't react on being fed propaganda. (13)
5. Immediate response to personal injury! (4)
6. Ferrous kind of sarcasm. (5)
7. Talks a lot of hot air - can be hazardous. (5)
10. Warm welcome home for space vehicle. (2-5, 4-2)
14. Prescribed or proscribed, which ever way you take them. (5)
15. Doctor unwell? What a bore! (5)
17. Heating and cooling is said to be a prayerful act. (9)
18. Doorstep of limited value. (9)
20. Plant operative incapable of human 1 across. (5)
21. Decimals do what accidents shouldn't. (5)
24. Fiery saint. (4)
25. Sometimes requires an overhead safety net. (4)

Answers to No. 3 Crossword Puzzle

D	I	S	P	E	R	S	A	N	T			C		I
	S		I		A		V		U		L	O	S	S
P	R	E	V	E	N	T	I	O	N			L		O
	S		O		K		D		D	E	C	O	C	T
			T		I				I			U		H
T	E	N	S	I	N	G		A	S	H	T	R	E	E
R		I			E	A	R	T	H			B		R
Y	U	C	K			G		O			A	L	U	M
C		K			N	I	T	R	O			U		A
A	E	O	L	I	A	N		R	I	M	S	E	A	L
P		F			P				L		I			
P	O	T	A	S	H		T		W		G		C	
I		I			T	R	A	D	E	U	N	I	O	N
N	U	M	B		H		L		L		O		S	
G		E			A	C	C	E	L	E	R	A	T	E

BOOK REVIEW

(Reproduced from the Hazard Forum Newsletter with permission)

Title: **SYSTEM SAFETY: HAZOP and Software HAZOP**
Authors: **Felix Redmill, Morris Chudleigh and James Catmur**
Publisher: **John Wiley and Sons**
ISBN: **0 471 98280 6**
Pages: **248**
Price: **£55**

Redmill, Chudleigh and Catmur provide a much-needed reference on HAZOP. The coverage of non-process industry applications and of software is particularly welcome.

The authors were largely responsible for producing the Interim Defence Standard 00-58 on HAZOP of Programmable Electronic Systems, and in some parts of this book much material is used directly or with adaptations from that standard and its associated guidance. However, this book provides extensive useful guidance additional to that already available in 00-58 and in most parts is extremely readable and well written.

On the whole this book is highly recommended for anyone contemplating the use of HAZOP, the extension of HAZOP to software-based systems or the use of other similar hazard identification techniques. It is marred only by a few remaining typographical errors, occasional lapses or inadequacies in technical content and two or three rather poorly written chapters.

The book provides a disarmingly simple and well-presented overview of Safety Management, and explains the role and importance of hazard identification in that context. It is welcome that the use of complementary and diverse identification and analysis techniques is recommended. However, the important activities of SIL derivation and its relationship to risk reduction are poorly covered. It is essential that readers explore the references quoted in this section if they are not already familiar. In order to facilitate understanding of the detailed guidance and recommendations throughout the book, a chapter providing an overview of HAZOP is provided early on. This short overview is extremely good and should enable readers to appreciate more readily the more detailed discussions which follow.

Chapter 4 provides a short clear discussion of the role in the HAZOP process of design representations and the attributes they present. Most importantly, it identifies a variety of these which have been successfully used as the basis for HAZOPs. The authoritative documentation of these here and later in the book will be useful for those using HAZOP outside the process industries. The next two chapters discuss the selection of a HAZOP team and the roles of those involved. This is an extremely difficult area because HAZOP (and any other hazard identification or analysis process) depends crucially on the management of the process and on the skills and experience of the persons involved, building usefully on the guidance provided in 00-58. Some of the recommendations regarding experience may be difficult to achieve; however, these two chapters provide extremely good advice. Chapter 7 addresses the thorny issue of guide words and strongly recommends using a single standard set of these, interpreting them appropriately to the application and design representation being considered. The excellent guidance on interpretation of guide words is based heavily on 00-58 but is none the worse for that. However, the emphasis on Object Oriented software representations means that the chapter seems somewhat unbalanced. There is scope for further guidance on a multitude of other representations at a later date. The editorial hand has unfortunately placed tables 7.5 and

7.6 in the wrong place for easy reference while reading the text, which is a pity since in most parts of the book the layout is extremely helpful to the reader.

The following two chapters, 8 and 9, deal with the planning and conduct of a HAZOP. They provide extremely good advice with several useful checklists for team leaders covering logistics, team briefings etc. Unfortunately much of Chapter 9 is unnecessarily wordy, and unaccountably there are no concluding remarks. This chapter would benefit from a succinct summary more than many of the others. A thorough review and rewrite of sections 9.2 to 9.7 would be useful in a later edition or in an addendum. However, as with the rest of the book, much useful technical material is provided and in the case of these chapters it is guidance which is not provided or is skimped in 00-58. Chapter 10 covers the recording and sign-off of a HAZOP meeting and very briefly discusses follow-up work. Again, the style is unnecessarily wordy and some important points seem to be missed, or poorly addressed. Nevertheless, provided the reader is prepared to work at this chapter, it provides useful guidance of a comparable standard to the rest of the book.

Chapter 11 deals with the role of HAZOP and of other hazard identification techniques throughout the system life cycle. The discussion of the place of differing levels of design abstraction in hazard identification at different stages in the life cycle is particularly good. The strongly made point that "No Hazard Identification is Perfect" is especially welcome as a point which practitioners must never forget and must always ensure is understood by other participants.

Chapter 12 deals with the problems of ensuring that a HAZOP addresses the typical situation where hazards are associated with combinations of deviations tracking concerns raised at a HAZOP session and dealing with compound flows. This may well be an area where further work is needed.

The next chapter, 13, describes aspects to be considered in applying HAZOP to "Human-centred Systems" using a navigation system and a medical diagnostic system as examples. The reader should be able to extend the guidance to the areas that interest him or her.

Chapter 14 provides outline guidance on the way in which a HAZOP study should be approached when dealing with systems where the environment or context of the system is subject to change. The example used is of a train protection system where the environment changes as the train moves through the railway. This chapter is probably worthy of expansion to address the problems associated with context change more generally.

Chapter 15 discusses two examples of PES HAZOP sessions based on material presented in an edited version of that presented in 00-58 and works extremely well at providing an insight into a HAZOP. Only a few typographical errors mar what is otherwise an excellent chapter.

The concluding chapter discusses the issues to be considered when introducing, auditing and managing process improvement of a HAZOP system, but adds little to the rest of the book.

In conclusion, this book provides a helpful and authoritative reference for those introducing HAZOP to an organisation or running HAZOPs within an existing process. As a companion to Interim Defence Standard 00-58 it provides useful guidance applicable to many types of system and many different engineering disciplines.

Iain Johnston

Forthcoming Meetings Of Subject Groups And Other Meetings Of Interest To The Safety And Loss Prevention Subject Group

Date	Subject Group	Title of Meeting	Venue
02-Mar-00	Energy Conversion	Energy from Waste and Biomass - State of the Art Project Review	SCI, Belgrave Square, London
02-Mar-00	IMechE *(co-sponsored by Food and Drink SG)*	The Effect of Legislation on Energy Costs in the Food and Allied Industries	IMechE, London
10/11 Mar-00	Computer Aided Process Engineering	Computer Aided Process Engineering SG Forum	UCL, London
14-Mar-00	Oil and Natural Gas (SONG)	Project Azure - Towards the reality of LNG production on an FSPO	Fountains Abbey Pub, Praed Street, London
27-29 Mar-00	RSC *(co-sponsored by the Water SG)*	Membrane Technology in Water and Waste Water Treatment	Lancaster
28-Mar-00	Computer Aided Process Engineering / Process Management Control	Life Cycle Modelling	Britannic House, London
28/29-Mar-00	Applied Catalysis (with RSC)	Kinetic and in situ methods in hetereogeneous catalysis R&D	University of Edinburgh
4- 6 Apr-00	I.Chem.E. North Western Branch	Hazards XV,	UMIST, Manchester
05-Apr-00	Fluid Separation Processes	Sustainable process selection to meet environmental targets (includes AGM)	UCL, London
05-Apr-00	Biochemical Engineering	Bioprocess Design VIII (&AGM)	Quakers Friends House, Euston Road, London
09-Apr-00	IChemE *(in assoc. with Energy Conversion SG)*	Gasification 4 - The Future	Amsterdam
11-Apr-00	Oil and Natural Gas (SONG)	The psychology of change - can we create and cope with the inevitable changes ahead	Fountains Abbey Pub, Praed Street, London
18-19-May-00	Environmental Protection	Waste Minimisation & IPPC Workshop	Peterborough
13-15-Jun-00	IMechE *(in assoc. with PTSG)*	From Powder to Bulk	IMechE, London
26-28-Jul-00	Strathclyde University *(co-sponsored by Process Management Control SG)*	Process Control and Instrumentation 2000	Strathclyde University
05-Sep-00	Filtration Society/RSC /Environmental Protection SG	Sludge 10 - waste treatment and disposal	Continuing Education Centre, University of Surrey

Provisionally Planned Meetings Of The Safety And Loss Prevention Subject Group For 2000

The meetings below are at varying stages of development and the dates are liable to change. If any of the topic areas are of particular interest, and you wish present papers, please contact the Subject Groups Officer at IChemE (tel: 01788 578214; fax: 01788 560833; email: jpicken@icheme.org.uk). He will supply the contact details of organisers.

May	Joint workshop on the design and location of occupied plant buildings:- update on the meeting held in November 1999, venue to be arranged.
Jun/Jul	Dee Water Protection Zone - Lessons learnt in loss prevention
Sept/Oct	Safety and Loss Prevention in speciality chemical manufacture (e.g. small batch).
Sept/Oct	Exothermic Emergency Venting
Nov	The Risk Assessment Life Cycle
Nov/Dec	Safe Process Scale Up

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

John Picken
IChemE
Phone: 01788 578214
Fax: 01788 560833
E-mail: jpicken@icheme.org.uk