



Learning from Accidents

EPSC International Conference 2008

Are We Doing Enough to Share the Lessons of Major Incidents?

EPSC has recently concluded work on Learning from Accidents which focuses on the use of incident reporting and action management systems for process safety incidents in several member companies. The Centre is to now hold a major public conference on contemporary leading edge approaches to near miss and incident management from reporting through investigation to resolution and the subsequent learning processes which reduce the odds of a future event

Introduction

It's not being very profound to say that we ought to learn from the experiences of others. When it comes to industrial safety, we should allow nothing to stand in our way of extracting all possible learnings from any mishaps that cause death and injury, or come close to doing so. Those learnings should then be disseminated as widely as possible, and picked up by all in industry who might gain from them. These processes - and three distinct processes are involved - should proceed as fast as possible.

The three processes are:

EXTRACT the learnings
DISSEMINATE the learnings to the world at large
GATHER the learnings into your organisation

Of course, there is a vital fourth step:

ACT on the learnings.

However, the frequency and the repetitious character of major incidents in the process industries suggest that perhaps we are not as productive as we might be with regard to the first three steps. It may be that we are not being sufficiently active in these areas. Almost all major incidents share causes and contributing factors with prior incidents. While identical incidents are rare, even rarer is the incident that has nothing in common with any previous one. Certainly, employers and employees do make use of lessons gained from others' mishaps, but they cannot do so if they never hear about them.

Push-Pull Effort Required

Investigations into major incidents - whether or not they cause death and injury - should proceed as rapidly as possible. When firm indications of causes or contributing factors are reliably identified, a report should be published for the purpose of alerting others in similar industries. This is the **PUSH** effort - once learnings are extracted from an incident, they must be pushed out into the world at large for all to use. This push should be done as early as possible, and be independent of, and not impeded by, any pending legal action. The alerting reports must be non-judgemental. Once out in the global "pool" of knowledge the learnings have to be gathered by whatever companies and personnel that could benefit from them. Companies must **PULL** the learnings into their organisation. This must be an active process. Company personnel must be constantly searching for such learnings. When found, they must be passed on to all personnel that might use them - from plant operators to senior executives.

Are We Doing Enough?

Analysis of recent accident investigations demonstrates that effective knowledge transfer of safety learnings might have prevented tragedy. This suggests that we are not succeeding at knowledge transfer regarding technical and organisational failures. Greater efforts must be made by companies, regulators, investigators and unions to **PUSH** learnings out to the world, and **PULL** learnings into the corporate knowledge bank.

Programme

Welcome Reception - Wednesday 8 October

19.00 - 21.00 An opportunity to listen to Robin Turney, former EPSC Technical Director, on his thoughts on lessons from incidents

Day One - Thursday 9 October

09.00 Welcome and Introduction from EPSC

09.15 Koos Visser, The Dutch Safety Board, Learning from Major Accidents: The Challenges



As former Head of HSE at Shell International Exploration and Production and now a Board member of the Dutch Safety Board, Koos Visser brings his experience. Koos Visser observes that safety is the product of leadership and taking responsibility, in other words a 'culture of safety'. Thus in thinking about safety, a holistic approach is required: it is vital to understand where responsibility for safety is vested and what this means in our complex societal systems.

The [Dutch Safety Board](#) is based in The Hague, Netherlands

10.00 Thomas Gell, NCO - Swedish Centre for Learning from Accidents. "New Approach to Learning"



In his talk Thomas Gell articulates the need for a fresh approach to learning from accidents. He places in context the relationship of major accidents to those of everyday accidents and international disasters. He argues that we may be prisoners to our current language for describing adverse events which results in excessive fragmentation in our prevention and emergency response efforts. Provocatively he asks are we doomed to be either preventers or responders

Thomas Gell is Manager of [NCO](#) part of Swedish Rescue Services Agency based in Karlstad, Sweden

10.45 Break

11.15 Piet Knijff, DSM - "Deep Learning from Incidents"



DSM has flow charted each stage of the incident reporting and investigation process. For medium and high risk incidents a series of checks are carried out to assess the effectiveness of the actions resulting from the investigation activity. A DSM work process 'learning from incidents' with its own tools is made available as a practice throughout the group. The talk will focus on the progress to date with the development and implementation of the work process across various operating sites within the DSM group and the challenges which have arisen.

Piet Knijff is a Senior SHE Advisor at DSM – the Life Sciences and Materials Sciences Company that employs some 23,000 people worldwide and is headquartered in the Netherlands.

12.00 Peter Webb, LyondellBasell – "Process Safety performance indicators – leadership and learning"



As is the case with many major hazard companies, Basell Polyolefins has achieved a significant reduction in work place injuries over recent years. A key factor in achieving this has been the leadership and engagement of senior managers. They have been helped by having been able to measure their successes and failures by counting the number of injuries. Since 2003, Basell has been developing a process safety performance indicator (PSPI) system which is intended to help senior managers similarly engage in achieving improvements in process safety. While process safety incidents across the industry have not killed or injured as many people as falls from height and moving vehicle accidents, they often have far greater business consequences. This talk will describe Basell's leading and lagging PSPI framework, and show how it is helping senior managers to get engaged in process safety. This is true not only for managers of a technical but also a non technical background. They now have a tool which will help them show leadership in process safety.

Peter Webb is HSEQ Manager at LyondellBasell at the Carrington site in Manchester, UK

12.45 Lunch

14.15 Frederic Gil, BP - "Animating the lessons from major accidents"



Major accidents from outside of the process industries, such as Titanic and Columbia, are reviewed against a 21st century process industry integrity management standard. Each such incident is then presented against accidents from the process industries to reinforce the learnings. For example, Titanic can be used to create learnings around the need for pre-start up safety reviews following an emergency shutdown; Columbia on institutional learning. The result is an in-house booklet that has been given wide circulation and subsequently offered to CCPS for publication. The paper will include extracts from non-process incidents and describe how they relate to the process industry.

Frederic Gil has 18 years experience as fire, process safety and loss prevention engineer working in petrochemical, oil and gas industries. He has particular expertise in critical system identification, fire engineering, permit to work requirements, emergency response, lessons-learned sharing, risk analysis, incident investigation and fire-safety teams management. Since 2004 he has coordinated the publication of 17 Process Safety & Fire Protection books with the Institution of Chemical Engineers (UK) and has co-authored one book published by the US Chemical Center for Process Safety.



15.00 Michiel Goethals, Federal Public Services, Employment, Labour and Social Dialogue, Chemical Risks Inspection Division - "Learning from Accidents: A regulator's perspective"

Michiel Goethals will describe the role of the regulator in the dissemination of lessons from major accidents and the rationale underpinning the approach. He will also present on inspection findings related to accident investigation and the various ways external accident information is acted upon.

Michiel Goethals is a process and labour safety inspector at the Chemical Risks Inspection division for the past 10 years. He represents Belgium in the European Technical Working Group on Accident Reporting and Analysis.

15.45 Break

16:15 Paul de Bruyn, TOTAL Petrochemicals – "The Return of Learning Experiences"



Paul De Bruyn will describe the outcomes of a recent review of how High Value Learning Experiences are exploited and made permanent within Total Petrochemicals. He concedes that too often the act of sharing lessons can be likened to a "message in a bottle" How often does the sharer receive feedback on their safety message from other sites which then motivates further learning and sharing? Paul will identify some encountered barriers and improvements in the implementation of the whole "return of experience" process in TOTAL Petrochemicals.

Paul De Bruyn holds a degree in Mechanical Engineering, Safety and Loss prevention and MBA. He started as technical inspector and became Safety Manager of the petrochemical facility in Antwerp. After 20 years he joined the corporate HSE team of TOTAL Petrochemicals in Brussels in November 2004. Activities include Mechanical Integrity Audits, Safety Management Audits, Incident Investigation, Return of Experience Sharing, Training and

Support.

17.00 Panel Discussion

17.30 Finish

Evening Conference Dinner including the Presentation of the EPSC Award 2008

After Dinner Speaker, John Bresland, US Chemical Safety Board



John Bresland was appointed the Chairman and CEO of the US Chemical Safety Board in March 2008. He previously served as a CSB board member from August 2002 until August 2007. From 1966 to 2000 he worked for Honeywell in West Virginia, Pennsylvania, Virginia and New Jersey. He held positions in process engineering, environmental compliance, project management and manufacturing. Before moving to Honeywell's headquarters in Morristown in 1995 he was Plant Manager of the Honeywell phenol and acetone manufacturing plant in Philadelphia. Until August 2000, he was Director of Environmental Risk Management for Honeywell International Inc. in Morristown, New Jersey. While working for Honeywell in Morristown he was responsible for their compliance with EPA's Risk Management Program regulation at 20 facilities in the United States.

Day Two – Friday 10 October

09.00 Start - Recap and summary from Day One

09.15 Andrew Hopkins, Australian National University – “Why BP failed to learn the lessons from elsewhere: the Texas City Refinery fire”



An explosion at BP's Texas City Refinery in March 2005 cost the lives of 15 people and injured nearly 200 more. BP had failed to learn the lesson of earlier incidents, such as the Esso Longford explosion, that major hazards are quite distinct from the hazards that give rise to most occupational injuries and must be managed quite differently. This paper explores the reasons for this failure to learn, focusing on the company's organisational structure and its incentive systems

Andrew Hopkins is Professor of Sociology at the Australian National University in Canberra. His recent books have focused in the organisational and cultural causes of major accidents. He was an expert witness at the Royal Commission into the causes of the fire at Esso's gas plant at Longford in Victoria in 1998. In 2001 he was the expert member of the Board of Inquiry into the exposure of Air Force maintenance workers to toxic chemicals. He has been involved in various government OHS reviews and has done consultancy work for major companies in the resources sector. He speaks regularly to audiences around the world about the causes of major accidents. He was a consultant to the US Chemical Safety Board in their investigation of the Texas City accident. His book on that accident, *Failure to Learn: the BP Texas City Refinery Disaster*, will be published in October 2008

10.00 Iain Clough, Marsh Limited – “Lessons from the Past: Are we learning, Can we learn?”



This paper will look at some of the lessons learned from major accidents within the oil and petrochemical industry around the world, and how well these have been implemented within similar industries. Specific issues that will be covered include:

- Distance from and elapsed time since the original major event; how easy, or otherwise, it appears to be to learn from neighbouring events or from events on the other side of the world.
- Learning from positive results, including effective barrier systems and good practices that may be available in similar industries and learning from 'mid-range' incidents
- Cultural challenges; how easy it appears to be to develop a 'safety culture' within new companies, and

countries with relatively young oil, gas and petrochemical industries; how the number of well publicised incidents may mirror the decline of the industry in some countries; what problems may exist in learning from incidents in other countries.

Iain is an experienced risk engineer within the energy insurance sector, and has industrial experience in various roles in the high hazard petrochemical industry in the UK.

10.45 Break

11.15 Andy Brazier - "Accident Avoidance"



It is easy to assume that the findings from investigations of major accidents only apply to the businesses in which they occurred. So, for example, unless you operate an offshore oil production platform, the findings from the Piper Alpha disaster will not be of particular interest. Equally, it is easy to assume that major accidents are in some way different to more "normal" accidents that you may experience. However, if you scratch below the surface, it very soon becomes apparent that there are many recurring themes in all types of accidents, across all industries. This means you can benefit from the time, effort and expense put into investigating major accidents by learning how to avoid them in your own business. This talk summarises a number of high profile major accidents, explaining the root causes. It will then show how these apply to business as a whole, and how you can learn lessons and avoid accidents.

Andy is an independent risk consultant specialising in human factors, ergonomics and safety. He has a degree in Chemical Engineering, and has worked in human factors for 14 years, with the last 11 being in consultancy. Andy runs his own safety [blog](#)

12.00 Bill Gall, Kingsley Management - "Investigating human and organisational factors aspects of incidents and accidents"



The presentation describes a recently-published document developed within a study jointly funded by the Energy Institute and the UK Health and Safety Executive. The document was originally intended as a guide to incident and accident investigation and analysis methods, focusing on those that are particularly useful in identifying underlying human and organisational causes of such events. It became clear, however, that the methods were secondary to the understanding and competence required of investigators. Sample incident reports were, in many cases, poor at describing and differentiating, for example, 'immediate' and 'root' causes. The guide was structured to introduce the key concepts and describe the most useful techniques available.

Bill is a Chartered Psychologist specialising in human reliability, safety management and safety culture. He provides advice and analysis services to all major hazard industries and their regulators. For the last 6 years, he has worked as an independent consultant primarily in the role of technical advisor and in developing guidance on key human factors subject areas. Latterly, this has included guidance materials on fatigue, incident and accident investigation and analysis methods, situational awareness (and other issues relating to human failure and recovery).

12.45 Lunch

14.15 Cheryl MacKenzie, US Chemical Safety Board – “Learning the Lessons of Accidents – A Perspective from the Chemical Safety Board”



In its 10-year history of investigative work, the U.S. Chemical Safety Board has been afforded the opportunity to delve deeply into the underlying layers of accident causation for over 50 chemical and refining incidents. And through each intensive examination of the facts, it has become clear that these high hazard industries are suffering from an epidemic of forgetfulness. The CSB continues to find similarities between companies' organizational and safety deficiencies. The specific details of each incident vary widely, but the major lessons do not. This presentation reviews a number of past CSB investigations and highlights some of the key lessons that companies should not forget.

Cheryl MacKenzie joined the CSB in September 2004. She has been involved in several CSB incident investigations, including the BP Texas City refinery explosion, Marcus Oil and Chemical tank explosion, Valero McKee refinery propane fire, and MFG Chemical toxic gas release. Prior to her CSB work, Cheryl completed extensive study and research in the fields of anthropometrics, biomechanics, human information processing, and design. Through critical application of human factors and ergonomic methodologies, she has conducted numerous usability assessments for clients in office, industrial and virtual-world work settings.

15.00 Koen Desmet, Antwerp Fire brigade – “High pressure ethylene leak in Antwerp Harbour



Koen Desmet is an fire officer at the Antwerp municipal Fire Brigade, with specialisation in chemical and industrial incidents. He is a co-evaluator of COMAH top tier installations in correspondence to the Seveso II directive. He has a PhD in chemistry of the University of Ghent and a degree as safety advisor of the Kaho Ghent.

15.45 Break

16.15 Linda Bellamy, White Queen – “Analyzing and presenting accident data with the StoryBuilder software”



Around five person years of effort went into analyzing around 10,000 occupational serious accidents reported to the Dutch Labour Inspectorate out of a set of 12000 investigated reportable accidents over a 6 year period. A tool called Storybuilder was developed specially for this purpose, giving a team of analysts freedom to capture as much detail as possible from accident investigations without being constrained by preconceptions about causes. However the analyst had to keep to a set of building rules, including rules for building models of safety barrier failures and loss of control events and underlying management failures relating to barrier integrity. A rich source of data is now available that can be explored from many different perspectives. 36 storybuilds of 36 hazard types cover practically all forms of accident hazard such as: Loss of containment, explosions, falls from height, contact with machines, falling objects, being buried and trapped, hit by vehicles, and more. For each of these hazards facts and figures sheets were produced which captured the highlights of each storybuild. The tool was also used in the investigation of a major scaffold disaster in the Netherlands and has demonstrated its usefulness with analyzing overfilling accidents in association with the Buncefield incident in the UK.

Linda Bellamy is a chartered Psychologist, Associate Fellow of the British Psychological Society, member of the Human Factors and Ergonomics Societies in the UK and US. From 2003 she has managed her own company White Queen Safety Strategies, based in The Netherlands near Amsterdam.

17.00 Panel Discussion and Wrap Up

Acknowledgement

We would like to acknowledge John O'Meara who authored the opening text of this programme.



John holds a Bachelor of Chemical Engineering and a Masters in Biomedical Engineering. John has had a diverse career as a process engineer in the food and dairy industries and also as a computer programmer for PC-based engineering applications, including logic simulation of process control systems. John now works as a freelance writer on safety in engineering, with particular interest in the dissemination of learnings from accident investigations. He has written on the Longford gas plant accident of 1998, including a co-authored paper to HAZARDS XVIII on the staffing arrangements at Longford at the time of the accident. John is currently researching Land Use Planning issues relating to Major Hazard Facilities in Melbourne.

EPSC Award 2008

In 2008 EPSC wishes to recognise those individuals or teams who have demonstrably acted on learnings from real or potential loss accidents which have occurred internal and external to their own organisations including industries different to their own. The outcomes from such activity may be seen to benefit the organisation alone or in addition be seen to have substantive benefit to wider industry and society

Such demonstration might include

- Discovery & awareness of own gap in performance or standards as a result of an accident which has resulted in a stepchange improvement in operation
- Innovative dissemination & communication of lessons from accidents to own workforce or public audiences
- Development of sources of information on accidents which are readily available to a company and wider public audience
- Development of education & training courses based on lessons from past accidents

The EPSC Award 2008 is to be decided by the EPSC Management Board and the winner will be presented the trophy at the conference dinner.

The Conference Organisers

The European Process Safety Centre

The [European Process Safety Centre](#) (EPSC) is a member funded network of European process industry companies, insurers, researchers and consultants, who share, develop and promote best practice in the field of process and major accident safety. The Centre's output include the publication of books and production of member reports, organisation of seminars and conferences, and the provision of technical advice and support to the European Commission. EPSC was founded by the European Federation of Chemical Engineering (EFCE) in 1992 and operates as a not for profit. The Centre is administrated by the Institution of Chemical Engineers based in Rugby, UK

Belgium Technological Institute

Founded in 1940 the [Technological Institute \(TI\)](#) took on the specific task of contributing to the propagation of science and technology, both amongst engineers and scientists, and the public at large. TI has been open not only to the highly qualified engineer, but also to the business world. TI therefore has close ties with industry through the engineer, the numerous participants in its activities and the corporate membership. TI is active in all professional fields where technology and science play a central part. TI favours an open policy as far as cooperation is concerned and offers industrial and academic circles as well as official authorities a platform dedicated to the exchange.

Institute of Industrial Safety Culture

The [Institute of Industrial Safety Culture](#) is a non-profit organisation based in Toulouse, France.

It has three objectives:

- help improve safety in industry, by exchanging experience and best practice and by transferring the results of safety research to industry;
- stimulate debate between high-risk companies and civil society, by promoting open and informed discussion on these sensitive issues;
- acculturate all stakeholders to the questions arising from risk and industrial safety

Deltalinqs

[Deltalinqs](#) represents both the port and industrial companies in Rotterdam in important issues of common interest. Deltalinqs focuses on strengthening the competitive position and the sustainable development of the port and industrial area, and advancing the political and social support for the activities of the participants.

Venue

The Conference will take place at the

Cultural Conference Center Elzenveld
Lange Gasthuisstraat 45
B - 2000 Antwerpen
Belgium

<http://www.elzenveld.be/home.cfm?source=welkom1&lanque=uk>

The 't Elzenveld is a cultural centre located in the medieval buildings of the former St. Elisabeth General Hospital. The tranquil, cloistered gardens, dating from 1804, are gorgeous with trees, shrubs, and exotic plants. The old convent has been renovated into guest rooms but still gives a glimpse of its former life with parquet floors and period furniture.

Hotel Accommodation

The conference organisers have negotiated a competitive rate with a number of hotels. Quote “**EPSC**” booking code for all hotels and book by **8 September 2008** to secure accommodation.

The Hotel Theater (4 star)

<http://www.vhy-hotels.be/hotel/4>

€135.00 single room rate per night

€155.00 twin/double room rate per night

This rate includes breakfast, service, VAT and city tax

Hotel Carlton (4 star)

<http://www.carltonhotel-antwerp.com>

€95.00 single room rate per night

€110.00 double room rate per night

This rate includes breakfast, service, VAT and city tax

Registration Form: Learning from Accidents 9/10 October 2008 Antwerp

For online registration visit: <https://www.icheme.org/epsc/LearnFromAccidents.htm>

Or please fax or post the completed form to:

EPSC, 165-189 Railway Terrace, Rugby, CV21 3HQ, UK
T: +44 (0)1788 534409 f: +44 (0)1788 560833

Organisation Name:	
Job Title:	
Last Name:	
First Name:	
Address:	
Post/Zip Code:	
Country:	
Direct Tel:	
Direct Fax:	
Email:	

Cost - A VAT invoice will be issued upon receipt of payment. VAT will be charged at Belgium rate of 21%. If your company is an established trader or registered in Belgium, VAT is not chargeable.

- €750 + VAT = € 907.50 **EPSC & Sponsor Members**
 €960 + VAT = €1161.60 **Non Members**

These fees include attendance at the conference sessions on Thursday 9th and Friday 10th October, lunches and interval refreshments, a welcome drinks reception on Wednesday evening and conference dinner on Thursday evening.

Method of Payment

(Payment must be received in full before the event date otherwise admission cannot be guaranteed)

- ❖ Please debit my credit/debit card:
- ❖ Cardholder name (as it appears on the card):

Billing address (if different from above): _____
_____ Post/ZIP Code _____

Mastercard Visa Visa Debit/Delta Maestro AMEX Debit Mastercard

Card Number:

Valid From Date:

Expiry Date:

Issue Number: (Debit only)

Security Code:

Card Holder's Signature:

Card Holder's Telephone Number:

Cancellation Policy

Cancellations received in writing before 1 September 2008 will be subject to an administrative charge of €250.00 + VAT. No refunds will be made for cancellations received after this date. Substitutions are welcome at any time.

We reserve the right to cancel or alter the programme.