



Hazards forum



The Hazards Forum Newsletter

Issue No. 68
Autumn 2010

Web version

Hazards Forum Newsletter

Issue No. 68 - Autumn 2010

Contents

- 2 Sir Frederick Warner
- 3 Avoiding Catastrophes – Are We Competent?
- 7 From the Secretary ...
- 8 The Undergraduate Health and Safety Risk Teaching Project
- 10 EFCE/EPSC Process Safety Presentation for Board Members and Chief Executives
- 11 Parliamentary and Scientific Committee
- 11 HSE eNews – Some Examples
- 12 Calendar of Events

Edited by James Kearns

Views expressed are those of the authors, not necessarily of the Hazards Forum

Further information regarding the articles in this issue is available from

Tim Fuller on 020 7665 2230, in the Hazards Forum Secretariat Office

E-mail: admin@hazardsforum.org.uk

Hazards Forum website: www.hazardsforum.org.uk

Hazards Forum Secretary: *Brian Neale*

September 2010

Sir Frederick Warner

The friends and colleagues of Sir Frederick Edward Warner were enormously saddened to learn of his recent death, on Saturday 3rd July aged 100.

Sir Frederick, who was always known as “Ned” was a leading authority of international renown on nuclear and chemical safety and was a former chair of the Hazards Forum. He assembled and led the first international taskforce into the Chernobyl nuclear power plant, following its meltdown in 1986.

Born in north London to his father, Frederick, a policeman, and Annie, he was educated at Wanstead national school and Bancrofts school. He then studied chemistry at University College London, and graduated in the midst of the Great Depression in 1931. Unable to find work, he returned to university to study for a postgraduate diploma in chemical engineering.

Sir Frederick’s first jobs were for the Stratford-based firm A. Boake, Roberts and Co., where he ran chemical manufacturing plants. This work gave him first-hand experience of the dangers of toxic chemicals, which caused some of his staff to exhibit odd behaviour. During war-time, he was asked by the government to build a plant at Drigg, near Sellafield, for the manufacture of nitric acid, which was required to make nitro-glycerine for TNT explosives. His success in building this plant at half the cost of the Imperial Chemical Industries’ design helped raise the reputation of chemical engineering. He also later worked with the RAF installing fog dispersal devices at their stations, for pharmaceutical company APV where he developed improved methods of penicillin production and for oil distillers Carless Capel.

In 1956 he founded the engineering consultation partnership Cremer and Warner with his friend Herbert Cremer. The firm helped solve problems with chemical plants, coal and oil gasification, and air and water pollution for various international. Some of the work he was most pleased with was the modelling of the flows on the river Thames and its findings on dissolved oxygen levels and sewage station outfalls. The work subsequently led to successful clean up operations which in turn led to the recovery of fish stocks and enabled the return of migratory salmon and sea-trout, which had been absent since Victorian times.

During this period he also served as an advisor on government and government-appointed bodies, such as the Royal Commission on Environmental Pollution and the Advisory Council on Energy Conservation. He also served as a technical advisor at the Flixborough chemical works inquiry and an assessor to the Windscale inquiry. He retired from Cremer and Warner in 1980. In 1982, Sir Frederick was appointed treasurer of the International Council of Scientific Unions’ Scientific Committee on Problems of the Environment (SCOPE), and subsequently chaired three projects which investigated the effects of major nuclear radiation exposures.

Sir Frederick was a founder fellow in 1976 of the Fellowship, now the Royal Academy of Engineering, and was elected a fellow of the Royal Society in the same year.

He was knighted in 1968, and is survived by his Wife, Barbara, whom he married in 1958, and by his four children, Robert, Elisabeth, Alex and Peter.

Sources include: Guardian.co.uk, Jane Sutton and Adam Duckett, Tuesday 27 July 2010, available at <http://www.guardian.co.uk/environment/2010/jul/27/sir-frederick-warner-obituary>

Telegraph.co.uk, 20 July 2010, available at <http://www.telegraph.co.uk/news/obituaries/technology-obituaries/7901346/Professor-Sir-Frederick-Warner.html>

Avoiding Catastrophes – Are We Competent?

Dr. Willie Boyle and James Kearns

On **Wednesday 16th June 2010** the Hazards Forum and the Institution of Mechanical Engineers jointly hosted an **evening event** at the latter's premises in Westminster, London. The event was sponsored by the Health and Safety Executive and supported by the Safety and Reliability Society.

The event was concerned with the procedures which businesses undertake to avoid large incidents and how the occurrence of such events sadly demonstrates the less than fully effective nature of such procedures. The event was also concerned with issues of competence from both the regulator and the duty holder perspective which arise when dealing with such accidents. The event began with **Hazards Forum Chairman Paul Thomas**, who welcomed the audience and thanked the Health and Safety Executive and the Safety and Reliability Society for sponsoring the event, and the Institution of Mechanical Engineers for hosting the event. Mr Thomas then introduced the **chair for the evening, Mr. Patrick McDonald, Chief Scientific Advisor** at the **Health and Safety Executive**. Mr. McDonald acknowledged the importance of the event's topic and questioned whether the decision makers responsible for preventing large incidents truly recognise the magnitude of the consequences involved with such events. He also noted that the causes of these accidents incidents are usually due to human factors, such as failures of leadership and questioned why businesses don't appear to learn from these mistakes.

There were three speakers for the event, which were followed by a brief talk by **Allan Bain, Development Director** of the **Safety and Reliability Society**, who discussed an upcoming event. After this there was a discussion period with the

audience and a reception for networking opportunities. The first presentation was given by **Mr. Rob Miles, Principal Specialist Inspector** of the **Human and Organisational Factors Offshore Safety Division** at the **Health and Safety Executive**, whose talk, simply titled "*Competence*", detailed the current state of affairs with regards to safety in UK offshore operations and described the measures organisations should take to ensure their staff are competent, as well as giving the regulator's view on this subject. This was followed by a presentation from **Mr. Stuart Greenfield**, of **DNV**, titled "*Risk Competency – improving people barriers*". In this presentation, Mr. Greenfield discussed how individuals within an organisation can operate in hazardous situations competently and how organisational and leadership aspects can aid individuals in this respect. Finally, **Mr. Dick Vote, Chair of the Institution of Mechanical Engineer's (IMechE) Safety and Reliability Group** discussed the approach suggested by the IMechE in avoiding engineering catastrophes. This talk, titled "*Engineering failures - how do we avoid them?*", explained the importance of thinking carefully about individual problems and presented a model which described the necessary processes which should be undertaken to ensure safety and reliability.

Mr. Rob Miles began his talk by explaining that the regulation of UK offshore safety follows a permissioning regime. This means that the duty holder of an installation must first present a Safety Case which satisfies the Health and Safety Executive's requirements for safe operation. The HSE will then allow the duty holder to operate on the condition that the installation is operated in the same manner as described in the Safety Case. Mr. Miles explained that the concept

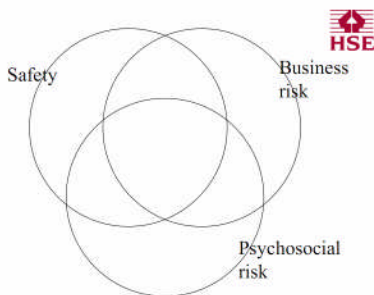
of “integrity” is very important when regulating operators. For the HSE, “integrity” is how closely the operator follows the requirements laid out in their Safety Case. Some of these requirements include only employing competent staff, conducting adequate risk assessments and maintaining equipment to a safe standard.

The UK offshore safety regime is a *permissioning regime*:



- The duty holder (usually the operator) sets out all of the hazards, and all of the means by which these are controlled, in a Safety Case.
- The HSE assesses that case and accepts it once it is satisfied that the measures described are sufficient for safe operation.
- The duty holder (operator) must then operate the installation (or rig) in the same manner as described to HSE in the Safety Case.
- For HSE *integrity* is “doing what you told us you would” and through that staying safe.

However, the inspectors usually find that a number of requirements are not being fulfilled. The reasons for this were that people throughout the organisation value the importance of safety differently, because of competing risks which affect every organisation: safety, business and psychosocial risks.



Mr. Miles made the point that the percentage of competent staff employed is a “leading indicator”, which means it can be used to predict accidents. However, when inspectors ask operators for the percentage of competent staff employed, the operators usually reply that 100% of their staff is competent. Mr. Miles mentioned that he is sceptical of this response and would not accept it. He told a story of one operator who had claimed that a target of only 65% staff competence had been set, which the operator was close to achieving. The operator had provided supporting documentation

detailing how the operating procedures had been modified to account for and tolerate safely this degree of incompetence.



The HSE have only recently begun serving Prohibition Notices to the duty holders for failing to provide an adequate number of competent staff. It has also been acknowledged that shutting a plant down for having too many incompetent staff can make it difficult for incompetent staff to receive further training and experience. The HSE are therefore looking at solutions that allow limited operation.

What do I understand by “competence”?



- An *individual* attribute?
- A *team* attribute?
- A trait like personality, a “quality” or an aptitude, or something anyone can learn?
Psychometric testing!
- How long does it last?
- Bought-in or developed in-house?
- Trained in a class or learned on the job?

*Manager: “Joe keeps having accidents”, HSE: “Well why do you keep employing him?”

There is a further problem with competence, in that it can be difficult to observe. One issue is whether incompetence should be looked for during the recruitment stage, before the staff member begins work or while the staff member is at work. Incompetence can also be hidden, for example, through forged certificates or dishonest self-assessments. Mr Miles then finished his talk by asserting that the overall competence of an institution can be inferred from how many members of the institution are being struck off, and that determining the true value of this figure is an important question for anybody considering the competence issue.

Mr. Stuart Greenfield then discussed the role which individuals within an organisation play in ensuring safe operation. This topic contrasts with other operational elements which must be considered in safety analyses: those of the integrity of the plant and its parts, and those of the integrity of the processes that occur within the plant. Organisations usually understand how these latter two elements affect overall safety, but understanding how “people integrity” affects safety presents some new problems.

Operating With Integrity



This focus on “people integrity” poses one fundamental question: are people inherently reliable? Mr Greenfield considered that people have two roles in work: a mechanistic role of fulfilling responsibilities and a more creative, less well defined role, which is the ability to apply experience and adapt to novel situations. If a person is to work in a reliable manner, then it is necessary to be “risk competent” in both these areas.

People – Their Two Roles....

- People need to fulfil their routine responsibilities, defined by the management system.
 - Performing a safety study
 - Reviewing indicators
 - Maintaining equipment
 - Operating the plant within defined parameters
- This is mechanistic, repetitive, well defined and should be within their “comfort zone”
- People underpin the plant and process barriers, and are at work throughout the management system

LEARNING BEHAVIOUR

- People apply their skills and knowledge to anticipate, and react to, the abnormal, in a way that a hardware system cannot
 - “This doesn’t sound right...”
 - “This doesn’t look right...”
 - “If this happens, then that could happen next, and then...”
 - “I need to take this action now to prevent...”
- This is creative, less well defined, and demands “aptitude” – the ability to apply experience.

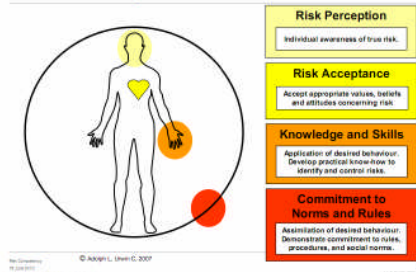
To be effective in both these modes of operation requires risk competence

Mr. Greenfield then presented a diagram explaining what is meant by “risk competence”. The diagram showed that there are four stages of risk competence.

Firstly, there is a commitment to norms and rules. This requires the worker to assimilate the desired behaviour. Secondly, the worker must develop relevant knowledge and learn the required skills. This comes from application of the desired behaviour and a learning of practicalities that help to identify and control risks.

Next there is risk acceptance. This is when the worker accepts the appropriate attitude towards the risks. Finally is risk perception, which is the ability of the worker to be aware of the true nature of the risks involved.

What is Risk Competence?



An example of the development of risk competence is the management system. This is one of many process safety systems which occur within a plant.

The management system provides a framework for people to operate in, and creates the proper environment for the organisation to function in. In terms of the risk competency model, this system allows the development of only the first two stages - the commitment to the norms and rules and the development of the relevant knowledge and skills.

These two stages involve only compliance from the worker – i.e. the requirement that he fulfils his responsibilities. To develop the final two stages of the risk competence model – risk acceptance and perception – requires something beyond just compliance. Mr Greenfield explained that this comes from leadership within the organisation.

Leadership Role

- Risk Perception does not always equal reality – we perceive risk through a cultural filter.
- Likewise Risk Acceptance depends upon a lot of transient factors.
- Leaders define the cultural environment within the organisation.
- So they heavily influence the perception and acceptance of risk.
- Leadership knowledge and behaviours are critical to achieve credibility and to ensuring both roles of people barriers are delivered to a desirable standard.

"If you don't believe in the messenger, you won't believe the message."



This is because leaders influence the cultural environment. Therefore, if the workers are to hold the right attitude towards risk, it is necessary for the leaders to also understand and accept the risks.

Mr. Dick Vote gave the final talk of the evening. This talk presented the IMechE approach to safety and reliability in engineering. This approach proposes that failures occur when there is unwillingness or an inability to be objective and realistic in assessing the engineering requirements.



The IMechE Approach

- Engineering Catastrophes and how to avoid them...
- In other words – making engineering work safely
- Do what it is supposed to do, when required, for as long as needed, at the optimal cost and not causing any harm or unnecessary environmental impact
- Common thread of failures is the unwillingness or inability to take an objective and realistic view of the mechanism of engineering the requirements

This inability to be objective and realistic can be caused by the use of assumptions which allow easy, quick or convenient solutions, but which are nevertheless inappropriate to the problem at hand. It can also be caused by too rigidly following procedures and an overzealous determination to complete tasks quickly.



The Gap

Questioning is a catalyst for thinking. As Professor McDermid told me, if he could replace all of the regulations with one word it would be: **"THINK"**. **Thinking can often be painful, difficult and not always immediately productive.** It is, of course, much easier and quicker to make convenient assumptions, or slavishly follow procedure or tick boxes.

Disaster Reducer Dave: "An independent review into the broader issues surrounding the loss of the RNFL Nimrod MR2 Aircraft XJ230 in Afghanistan in 2007"

- "We haven't got time for this!"
- "We don't have the data"
- "We can sort it out when it is in service"
- "The contractor has assured us it will be OK"
- "Well, your report says that we have got away with it for 30 years by the skin of our teeth so we don't need to spend anything"

The IMechE therefore advocate a "thinking" approach. This means that each problem is unique and should be treated on an individual basis. The aim of the thinking approach is to avoid the oversimplifications described above by developing a framework that can be applied to each individual problem to ensure that it is treated in such a way that allows safe and reliable delivery in a stable and sustainable manner.



The IMechE **THINKING** Approach

- Work in Progress – initiated by Brian Wimpenny and now a team effort
- How does a professional mechanical engineer go about the process of ensuring safe and reliable delivery, stability and sustainability?
- Not the province of a socially challenged nerd with a bumper book of failure rates
- A THINKING PROCESS!!!!

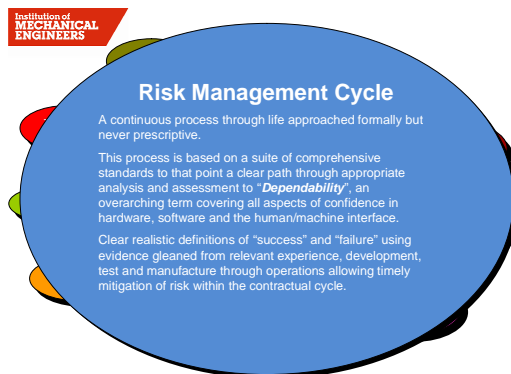
Mr. Vote then presented this framework, which is called "the dependability cycle for safety and reliability", or more simply "the ring of confidence". The ring of confidence consists of eleven sections, each of which is a stage which engineers should consider in the process of delivering requirements.

These eleven sections are: scope, assessment and modelling, sound engineering, tolerability of risk demonstration, manufacture and commissioning, operation and maintenance, organisational interfaces, environmental impact, documentation, through life management and quality assurance. Mr. Vote explained in detail each of these stages.

For example, when considering scope, the engineer is confronted with questions such as "what is the product or service?", "what environment will it operate in?" and "how will it be used?" When considering operation and maintenance, some of the questions will be "do the operating documents support the assumptions made in the design?" and "does the maintenance programme keep the product/system safe?"



Each of these sections raise important questions, and consideration of each stage should ensure dependable delivery. The model is also intended to be viewed as a continuous cycle, so that the user should always be able to revisit each stage whenever necessary. Mr. Vote did stress, however, that this was still a work in progress.



Mr. McDonald then thanked the speakers for their presentations, and invited **Mr. Allan Bain** to give a brief talk.

Mr. Bain briefly discussed the role of the Safety and Reliability Society, and the work they are undertaking to integrate various disparate strands within the engineering industry. This work would be

presented at an event to be held in September. Mr. McDonald then opened the floor for questions.

The following discussion, which consisted mainly of comments from the audience rather than questions to the speakers, focussed on issues of competence of senior leadership, or lack thereof, impacting on the performance of lower level workers, for example through business pressures. It was apparent that many individuals were of the opinion that this issue did not receive enough attention in the industrial sector. Other issues discussed were the short-term nature of the corporate memory, the issues involved with educating new recruits about the issues surrounding risk and what kind of expenditure was appropriate to mitigate catastrophes.

The chairman for the evening thanked the sponsors for the event, the speakers for their talks and those who had contributed to the discussion. The Chair then invited all attendees to network and continue any discussions over the light refreshments which followed.

[Ed. note: More information on the IMechE "Ring of Confidence" can be found in Newsletter No.67, *Summer 2010*.]

[Ed. note: Mention was made in the discussion of a DVD which includes promoting process safety culture and a trusting, open environment. Further details, including where available, can be found on *Page 10* in this *Newsletter*.]

From the Secretary ...

In the calendar towards the back of this Newsletter, more events by member organisations can be seen included. These help to develop this feature and thus as a focus for members to see what is going on outside their immediate sphere of attention that might be of interest. Member organisations are thus **encouraged to submit events** they feel will be of interest to other members of the Hazards Forum community. It is also worth looking at the website Events page which has updated information.

The events are usually conferences or other events such as technical meetings where there may be a charge to attend – or perhaps, free to attend. **Where there is a charge**, Hazards Forum members are usually given host organisation members rates – but it is always worth checking! Brian Neale

The Undergraduate Health and Safety Risk Teaching Project

Professor Richard H. Taylor
Chairman, Inter-Institutional Group on Health and Safety

Background

This project arose as part of the programme of the Inter-institutional Group on Health and Safety (IIG). The IIG aims to carry out joint projects and provide collaboration in the area of health, safety and risk between the major engineering institutions, together with a number of other bodies including the Engineering Council, the Hazards Forum, the Institution of Occupational Safety and Health (IOSH) and some more specialist societies with an interest in the field. The Health and Safety Executive (HSE) also attends IIG meetings.

Several years ago, the IIG was concerned that there was little teaching material on the principles relating to health and safety risk management available in the higher education sector in the UK, and that many young engineers leave university with a very limited understanding of the subject despite its importance in the context of their future work. Consequently, the IIG initiated a project to explore how this issue could be addressed.

The intention of the project was to develop a common framework of material for teaching undergraduate engineers about health and safety risks in an interesting and engaging way for students of all engineering disciplines. Its aim was to provide stimulating material based largely on e-learning techniques and to provide a common basis and vocabulary for all undergraduate engineers to understand the key concepts and be able to apply these to manage risks.

It was designed to have a strong emphasis on their personal role, aiming to provide

them with a grounding on which they could build a deeper understanding in their engineering specialism as the need arose. The package, when fully developed, was designed to be modular, so that universities could either teach the material as a single course or use elements of it as required. It was also designed so that more specialist material, developed to meet specific needs, could be 'hung' on the framework provided. It was envisaged that it would be free to teaching establishments and would be designed to run on their intranets.

Discussions took place about ways in which it could be kept up-to-date and how universities would be enabled to share material as it further developed.

The project was carried out in a number of phases. Initially, the IIG set up an expert group to suggest learning outcomes and to assess university interest. There was a strong positive response from several universities and major companies that were approached at this early stage. The Engineering Council strongly welcomed the development in relation to the UK Standard for Professional Engineering Competence. It was seen to meet a specific need recognised by the HSE in their document "The Health and Safety of Great Britain \ \ Be part of the solution".

Subsequent work was funded by the HSE working closely with the IIG. This was progressed in **two further phases**.

First, an innovative approach was developed to provide a platform for the material. This was based on the user becoming part of a virtual team of young graduate engineers involved in several projects covering a variety of engineering

disciplines e.g. a construction project; operations at a petrochemical process plant; a 'cradle to grave' design project, and follow up to a serious event from which the team would develop an understanding of cultural, organisational and 'people' issues. The student user was to be involved in making decisions as part of this virtual team. This approach gained strong support from all interested parties, including a sample of engineering students.

Second, a demonstration CD-ROM was developed showing examples of e-learning tutorial material and an example video game approach to spotting and understanding hazards on a construction site and the use of risk assessment. It also provided attention-grabbing messages about the importance of health and safety in our lives. This not only provided a good quality demonstration and 'proved the concept', but also allowed an outline cost estimate to be developed for the full project.

Proposed Developments

In addition to the universities and engineering institutions involved from the earlier phase, the CD was widely distributed and several papers and conference presentations were given. Discussions were held with about 30 organisations including major industrial companies, universities, engineering bodies (e.g. The Royal Academy of Engineering), and several charitable trusts. **This resulted in very positive feedback** and ideas on further development and involvement. Suggestions were obtained on the potential for further funding to build the complete package and several organisations indicated that they may be willing to contribute. A number of universities expressed a wish to be involved in further developments and to use material as it became available.

During the discussions several issues emerged which are now leading to a further assessment of **how the project can be driven forward**. This has been

supported by IOSH with input from the Health and Safety Laboratory and IIG members.

Firstly, the use of high-quality gaming techniques is very expensive and there have been concerns expressed that they need to be developed to a very high standard if they are to meet the expectations of the student user. Therefore, whilst maintaining the interactive, e-learning approach and overall objectives, other more cost-effective approaches are being explored.

Secondly, it has been pointed out that the teaching material being developed may be of value to other potential users. Several companies have expressed an interest in its potential for corporate training, and other educational uses have been suggested such as in schools, further education (e.g. for technician engineers), and other non-engineering undergraduate groups.

There has also been interest in its potential for use outside the UK. It has also been suggested that some elements of the material could be useful in a wider educational context in helping people understand the importance of health, safety and related risk issues in their lives and perhaps countering some of the negative views about the subject which are currently held by some.

Thus, whilst meeting the prime target of developing material for undergraduate engineers, in reformulating the material, the opportunity is being taken to explore how the potential needs of other users might be addressed and to develop a 'resource' which might have wide application.

Thirdly, it has also been pointed out that the material might benefit from some sections being designed to be more specific to particular branches of engineering. Without losing the overall objective of providing material which would provide a common grounding and 'vocabulary' for all engineers, the opportunity is being taken to explore whether a limited amount of the material can be designed to be more specific to

particular areas of engineering. For example, material illustrating important issues relating to 'learning from disasters' or 'hazards in the workplace' might be made more relevant to, for example, chemical or civil engineers. An objective might thus be to have alternative, but similarly designed material for each specialism in these important areas. It is suggested that such material might then be seen by the student user as more meaningful and relevant to their specific engineering discipline. The role of the engineering institutions in identifying, and possibly in developing, some of this material is to be explored.

The IIG is now considering ways the project can be **given renewed impetus**, in the context of the specific feedback

received, the wider potential application and the need to minimise overall project costs whilst maintaining quality. It is anticipated that further discussions will soon be launched with the engineering institutions, potential industry sponsors, universities, and other bodies that may wish to help consider its wider use. The HSE and HSL continue to recognise the value of this project as it wants to see the education system embed understanding of risk as a life skill so that young people joining the workforce are more risk aware.

For more information please contact the IIG Secretary Graham Barber, gbarber@theiet.org

EFCE/EPSC Process Safety Presentation for Board Members and Chief Executives

John Atherton
Secretary, Safety & Loss Prevention Subject Group, IChemE

At the European Federation of Chemical Engineering (EFCE) 2007 Loss Prevention Conference at Edinburgh, Mike Parker, then CEO of BNFL, made a keynote address in which he challenged the profession to make greater efforts to promote process safety at Board/CEO level. The result is a package developed in conjunction with European Process Safety Centre (EPSC), titled "Process Safety Pays" that was launched at the EFCE Loss Prevention Conference in Bruges in June 2010.

The package contains a 7 minute DVD that delivers the safety and quality message against the background of the private aviation industry. It is supported by a PowerPoint presentation designed to be customised by a senior process safety manager or board member who facilitates the internal conversation. In addition to promoting process safety culture and a trusting, open environment as a core business values, the DVD contains messages from the CEO of Jetline Business Aviation, the Director General of CEFIC European Chemical Industry Council, and the Chairman of the Supervisory Board of Morgan Stanley Bank AG. The package also contains a booklet to advise on how to obtain best value from the presentation materials.

The package, sponsored by Bayer, CEFIC, BG RCI, Dow, BASF, Clariant, Lloyds Register, Novartis and Tuv Sued, is available through the EPSC website: <http://www.epsc.org/content.aspx?Group=products&Page=dvd> . Full ordering details are included on this website. The PowerPoint presentation and advisory booklet can be downloaded free of charge; a nominal charge of €50.00 plus VAT is made for the DVD to cover reproduction and postage costs.

Parliamentary and Scientific Committee

The latest issues of “Science in Parliament”, the journal of the Parliamentary and Scientific Committee of which the Hazards Forum is a member, has among its contents the following articles. Any member who would like any further information on any of the articles below should visit the PSC website www.ScienceInParliament.org.uk

SCIENCE, INNOVATION AND THE ECONOMY	The Rt Hon David Willetts MP
NEW GOVERNMENT, NEW PARLIAMENT, NEW PEOPLE, SAME ISSUES	Paul Davies
NEW REPORT REVEALS PUBLIC'S VIEWS ON SYNTHETIC BIOLOGY	Matt Goode and Nancy Mendoza
OBITUARY - LORD FLOWERS	
ECTON MINE – FROM COPPER-BOTTOMED SHIPS TO A-LEVEL CHEMISTRY	Dr Stephen Henley FGS FIMMM CEng
CONSUMER ENGAGEMENT WITH EMERGING TECHNOLOGIES	Rob Reid Matthew Lloyd Architects
WATER & SOLAR POWERED PASSENGER LIFT	
LEADING LIGHTS ANNOUNCED IN STEMNET AWARDS	Dr Michael Dixon OBE MB BS LRCP DRCOG FRCGP
EATING FOR BETTER HEALTH THE FOREWORD	
VOLCANIC ERUPTIONS, CATASTROPHIC EARTHQUAKES & TSUNAMIS – HOW CAN WE REDUCE THE TOLLS ON HUMANITY?	Professor RSI Sparks FRS, Dr Rui Pinho and Dr Tiziana Rossetto Sir Martin Taylor FRS David Ross Dr David Dent
THE VALUE OF SCIENCE	
HIGH SPEED RAIL	
A GAP IN THE INNOVATION MARKET	
WHAT IS SEAMLESS WEATHER FORECASTING? HOW CAN WE FORECAST YEARS AHEAD, AND MANAGE THE FINANCIAL RISKS PROFITABLY?	
THE BALANCED ECONOMY - THE NEED FOR STEM CAPABILITIES	Professor Geoffrey Le Gry
MAKING BRITAIN HEALTHY: UTILISING THE INNOVATION IN VITRO DIAGNOSTICS CAN PROVIDE TO THE NHS	Doris-Ann Williams Andrew Miller MP Countess of Mar
ENGINEERING THE FUTURE	
WHAT PRICE SCIENTIFIC INTEGRITY	

HSE eNews – Some Examples

++ Managing for Health and Safety ++

Health and safety and successful business or organisation performance are complementary. Good leaders look after their businesses/organisations, and manage skilled workforces who have confidence in them. As with all parts of your business/organisation practice, to manage health and safety you need to plan, deliver, check quality and take stock to see what you can improve.

<http://www.hse.gov.uk/managing/index.htm>

++ Prosecution Resulting from Buncefield Explosion ++

Five companies have been ordered to pay a total of £9.5m following the fire and explosion at Buncefield Oil Storage Depot in 2005. The firms were sentenced on Friday 16 July at St Albans Crown Court following a joint prosecution by the Health and Safety Executive (HSE) and Environment Agency (EA).

<http://www.hse.gov.uk/news/buncefield/index.htm>

Calendar of Events

Please check the Events section of the Hazards Forum website for more information at www.hazardsforum.org.uk and to see any updates in the calendar. These may include additional events or perhaps amendments to the Events shown below.

Please note that attendance at Hazards Forum events is by invitation.

Date	Event	Venue	Contact/further information
SEPTEMBER			
14	IMechE Event, HF Supported: Engineering Judgement - The Impact of Ethics	University of Leeds	http://events.imeche.org/EventView.aspx?code=W1457
20 - 24	IChemE: Fundamentals of Process Safety	London	Madeleine at MCharles@icheme.org
20 - 22	IChemE: HAZOP study, leadership and management	Leeds	Madeleine at MCharles@icheme.org
21	>> HAZARDS FORUM EVENT: Avoiding catastrophe - driving for competence at the top	Institution of Civil Engineers, One Great George Street, Westminster, London, SW1P 3AA	Tim at hazards.forum@ice.org.uk
23	IMechE Event, HF Supported: Using Human Factors for Engineering Success	Austin Court Conference Centre 80 Cambridge Street Birmingham, B1 2NP	http://events.imeche.org/EventView.aspx?code=S1541
29 – 30	IChemE: Layer of Protection Analysis (LOPA)	Manchester	Madeleine at MCharles@icheme.org
OCTOBER			
6	IET: President's Address	IET, Savoy Place, London	http://www.theiet.org/events/2011/presidents.cfm
13 - 14	IMechE event, HF supported: Nuclear Ventilation seminar	Haydock	http://events.imeche.org/EventView.aspx?code=s1547
14	Safety and Reliability Society Event: 30 Years of Risk Assessment	Royal Institution of Naval Architects, Upper Belgrave Street, London	www.sars.org.uk
18 – 20	IChemE: HAZOP study, leadership and management	Leeds	Madeleine at MCharles@icheme.org
27	IMechE Event, HF Supported: What is Reliability?	IMechE, 1 Birdcage Walk, London, SW1H 9JJ	http://events.imeche.org/EventView.aspx?EventID=840
NOVEMBER			
8 – 12	IChemE Event: Fundamentals of process safety (nuclear)	Hinckley	Madeleine at MCharles@icheme.org
16 – 19	IChemE: Hazop study for team leaders and team members	Manchester	Madeleine at MCharles@icheme.org
18 - 19	IET: Railway Law for Engineers	IET, Savoy Place, London	http://www.theiet.org/events/2010/railway-law.cfm
25 - 26	I of Erg & HF*: Human & Organisational Factors in the Oil, Gas & Chemical Industries	Manchester Conference Centre	http://www.ogc2010.org/
26	IMechE event, HF supported: Living with DSEAR	Institute of Mining & Mechanical Engineering, Newcastle	Jacqui at J_Parker@imche.org
30	>> HAZARDS FORUM EVENT: Ageing infrastructure	Institution of Civil Engineers, One Great George Street, Westminster, London, SW1P 3AA	Tim at hazards.forum@ice.org.uk
JANUARY 2011			
11	IET: Thrills not Spills - Evening lecture	Shrewsbury	http://www.theiet.org/local/uk/westmids/salop/events/thrills-not-spills.cfm

* Institute of Ergonomics and Human Factors

The Hazards Forum's Mission is to contribute to government, industry, science, universities, NGOs and Individuals to find practical ways of approaching and resolving hazard and risk issues, in the interests of mutual understanding, public confidence and safety.

The forum was established in 1989 by four of the principal engineering institutions because of concern about the major disasters which had occurred about that time.

The Hazards Forum holds regular meetings on a wide range of subjects relating to hazards and safety, produces publications on such topics, and provides opportunities for interdisciplinary contacts and discussions.

The Hazards Forum
One Great George Street
Westminster
London SW1P 3AA

E-mail: admin@hazardsforum.org.uk
Telephone: 020 7665 2230
Fax: 020 7799 1325

Website: www.hazardsforum.org.uk

Registered charity number 1047047