



Hazards forum



The Hazards Forum Newsletter

Issue No. 73
Winter 2011

Web version

Hazards Forum Newsletter

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Edited by James Kearns

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

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Hazards Forum Secretary: *Brian Neale*

December 2011

Professor Ernest Shannon

The friends and family of Professor Ernest Shannon CBE FREng were greatly saddened by the news of his death on September 2nd, aged 73. Professor Shannon was a renowned engineer who was until recently a member of the Hazards Forum Executive Committee. A full obituary will be published in Newsletter No. 74.

Keeping the Country Running: Implementing Government's Initiatives for Infrastructure Resilience

James Kearns

On **Tuesday 20th September 2011** the Hazards Forum hosted an **evening event**. The event was sponsored by the Institution of Mechanical Engineers and was held at their premises in Westminster, London.

This event continued the theme of the previous event by looking at the resilience of national critical infrastructure to hazards and threats, with a particular focus this time on the risks posed by natural hazards¹ and in particular how initiatives such as partnerships between regulatory agencies are being implemented. A critical infrastructure owner and manager also discussed their considerations for dealing with such hazards. The event began with a few brief words from **Hazards Forum Chairman** Rear Admiral (retd) **Paul Thomas CB**, who welcomed the audience and thanked the Institution of Mechanical Engineers for sponsoring the event. He also explained that the event was taking a slightly different approach to previous events as there would be five speakers as opposed to the usual two or three. He then welcomed the **chair for the evening John Tesh, Deputy Director** of the **Civil Contingencies Secretariat** in the **Cabinet Office**. Mr. Tesh thanked the Hazards Forum for holding this event, and introduced each of the evening's speakers.

The first speaker was **Dr. Mat Barber**, also of the **Civil Contingencies Secretariat** at the **Cabinet Office**, who gave a talk titled "*Keeping the Country Running: National Hazards and Infrastructure*". This talk was a follow-up to the one he gave at the Hazard Forum's previous evening event, which presented the latest policy thinking on approaches to building resilience in the UK's national infrastructure, particularly in respect of natural hazards. He also discussed the continuing initiatives being developed, mainly in terms of partnership working.

The second speaker was **Paul Davies, Chair** of the new **Natural Hazards Partnership**, who gave a talk titled "*What the Natural Hazards Partnership Can Do for You – and what it is!*" in which the setting up of this group and the role it plays in helping organisations across different sectors with their responsibilities in building and maintaining resilient infrastructure was described.

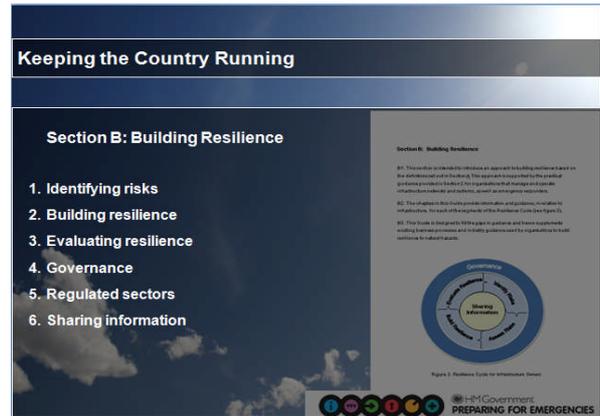
Following this was a presentation titled "*The Science Behind the Solutions*", given by **Dr. Christopher McFee, Head of Civil Contingencies and Natural Hazards** at the **Government Office for Science**, during which he discussed how science and engineering advice is used in responding to

emergencies which may have an impact on key infrastructure.

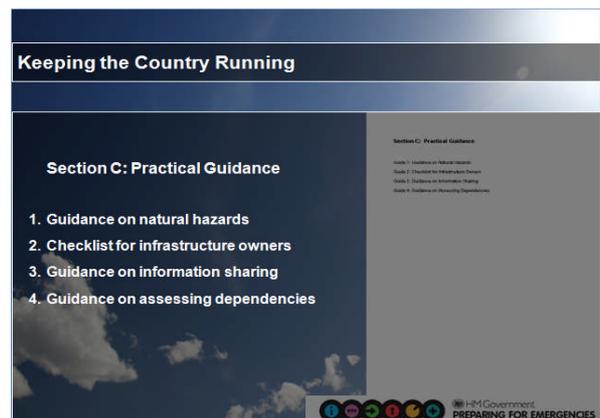
The fourth presentation was given by **Paul Mustow, Head of the Flood Forecasting Centre**, which is a joint **Environment Agency – Met Office** partnership. In this talk, which was titled “*Flood Forecasting for Emergency Responders and Bespoke Warning Services for Resilient Infrastructure*”, Mr. Mustow shared his experiences of delivering services to government bodies and category one and two responders. He also discussed recent developments from the Environment Agency, who are providing bespoke flood warning services for resilient infrastructure.

The final talk of the evening, which had the title “*A Major Infrastructure Owner Working to Keep the System Running – How is it Done?*”, was given by **Professor Andy Doherty, Director of Railway System Engineering at Network Rail**, who shared his experiences of how a major infrastructure owner is working to keep the system running by making full use of available technology. He also outlined where Network Rail look for inspiration for developing their approach and outlined some possible future developments.

Dr. Mat Barber opened the evening’s presentations with a scene-setting talk regarding work which the Civil Contingencies Secretariat is carrying out on improving infrastructure resilience. This talk was a continuation of Dr. Barber’s presentation at the previous Hazards Forum evening event. It was explained that most of this work began as a result of Sir Michael Pitt’s review of the 2007 floods² in which some critical infrastructure was adversely affected. This work has been recently published by The Cabinet Office in a consultation document³ titled “*Keeping the Country Running: Natural Hazards and Infrastructure - a Guide to Improving the Resilience of Critical Infrastructure and Essential Services*”.



This document describes how resilience can be improved by identification and evaluation of risks, effective governance and regulation and through sharing of information. It also offers practical guidance on natural hazards, information sharing and assessing dependencies, as well as a checklist for infrastructure owners.



Dr. Barber’s talk raised a few technical questions from the audience regarding definitions of what constituted a “reasonable worst case” scenario. John Tesh explained that the scenarios were not precisely defined and that judgement coupled with the available scientific evidence was used.

Mr. Paul Davies gave the second talk of the evening, in which he described the setting up and the role of the Natural Hazards Partnership (NHP). This is an informal cross-discipline body of experts from around twelve different groups and agencies who, together, provide recommendations on the risks posed by natural hazards. A multi-hazard approach is taken whereby primary, secondary and further hazards from a single source are identified and appraised. For

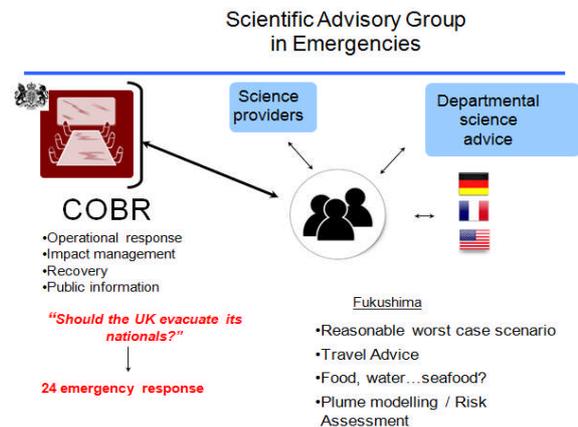
example, stormy weather could lead to the both the public and infrastructure facing primary hazards of heavy winds and flooding, a secondary hazard of landslides and a tertiary hazard of infectious diseases. Without the NHP, each of these hazards would require monitoring and management by different regulatory bodies and centres. In the event of an emergency it would be difficult to attain the necessary coordination in action required between these groups.



The NHP has been created against a backdrop of serious natural hazard events such as the eruption of the Icelandic volcano in 2010. It starts to address recent calls for better integration and coordination of natural hazard advice and response across Government. Currently there are thirteen partners, including the British Geological Survey, Cabinet Office, Centre for Ecology and Hydrology, Defra, Environment Agency, Government Office for Science, Health Protection Agency, Met Office, National Centre for Atmospheric Science, National Oceanography Centre, Ordnance Survey, and UK Space Agency along with joint Environment Agency/Met Office Flood Forecasting Centre (FFC).

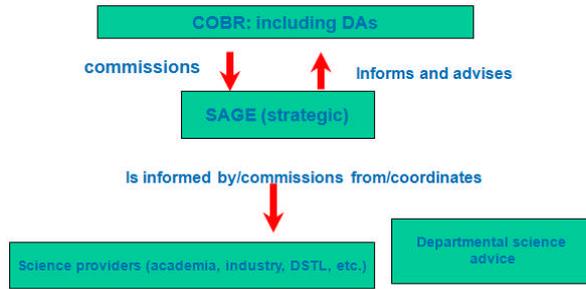
Sharing information effectively between different partners should enable organisations to provide an early warning of a potential incident, offer a specific technical response to a major incident and provide consistent, coherent information to the wider community. The NHP aims to provide responders with a focal point for hazard information and advice, particularly when more than one hazard occurs simultaneously, or one individual hazard actually prompts others.

The third talk of the evening was then given by **Dr. Chris McFee**, who explained how expert science and engineering advice is communicated and used by the Government during an emergency. Dr. McFee started his talk by giving an example of when his department – the Civil Contingencies and Natural Hazards team at the Government Office for Science – helped the British Government's efforts in ensuring the safety of its citizens during the Japanese nuclear incident at Fukushima resulting from the earthquake and subsequent tsunami. In particular, the measures which were considered were the distribution of iodine tablets and the evacuation of individuals to Tokyo.



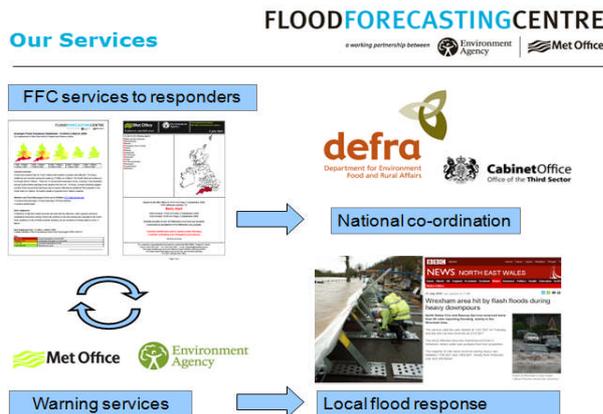
The general framework for how scientific advice is communicated to Government was then explained. Advice comes from a number of science providers (e.g. from academia and industry) and relevant Government departments or regulators. During an emergency, the Government will convene a COBR committee to decide on appropriate courses for action. COBR commissions a strategic group called SAGE who is informed and coordinated by the science providers, Government departments and regulators, to advise them on the scientific matters.

The use of scientific advice in an emergency



Some of SAGE's principle functions include commissioning new research, helping to generate policy options, producing response scenarios and advising on measurement/research capability, such as understanding scientific uncertainty and limitations.

Mr. Paul Mustow then gave the next presentation, in which the role of the Flood Forecasting Centre (FFC) was described. The FFC is joint partnership between the Met Office and the Environment Agency – an early example of such a partnership in this sector - and resulted from a recommendation in the Pitt Review. The FFC, set up in 2009, take a risk based approach to flood hazard assessment, ranking each hazard according to its impact and likelihood.



It has already provided valuable guidance to emergency responders in flooding situations, most notably in the days leading up to the 2009 Cumbria floods, where for the first time, it had been possible to evacuate individuals before the flooding event.

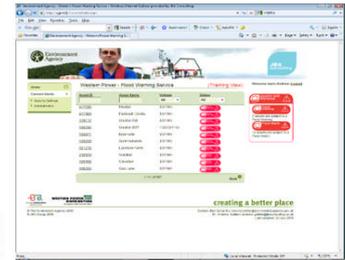
The FFC's expertise is in hydrometeorology. This involves taking a holistic approach to flood forecasting, developing a framework for improving skills in the industry, fostering greater trust by raising industry standards and improving efficiencies and value for money.

FLOODFORECASTINGCENTRE
a working partnership between Environment Agency and Met Office

Resilience

Bespoke services:

Targeted Flood Warning Service



In conjunction with the FFC's services the Environment Agency now offers bespoke services in the form of their Targeted Flood Warning Service. Users of this service are able to input their facilities and infrastructure which they feel is at risk of flooding and will in turn receive location-specific updates on flood warnings. Users of this service have been able to target their responses to such warnings more effectively, enabling more immediate action to be taken, where required.

The evening's final talk was given by **Professor Andy Doherty**, who described the infrastructure risks faced by Network Rail (NR) and how these are being managed to ensure the safety and reliability of the UK rail system. NR has a large infrastructure portfolio, including 31,000 kilometres of track, 38,000 bridges, 2,500 stations and 700 tunnels. NR consequently has considerable exposure to natural hazards which must be managed to ensure that the infrastructure retains its integrity. Furthermore, it was explained, railways have evolved to cut through landscape, rather than go around them. This makes them particularly vulnerable to floods, high groundwater levels and extreme rainfall.

Prof. Doherty gave an example of the costs of natural hazards faced by NR. In 2007 the

costs of water-related hazards was around £116M, and in any typical year this can vary from £50M to £150M.

Safety and performance are the main drivers for NR. In order to deliver these, a good working knowledge of assets is essential. Pre-emptive measures such as inspections, maintenance and investment are also necessary.

NetworkRail

Keeping the system running



- Safety and Performance are NR drivers
- Good asset knowledge is essential
- From 'Find and Fix' to 'Measure and Predict'
- Pre-emptive procedures:
 - Inspections, Maintenance, Investment
 - Operational preparedness

Use of simple, basic Inspections to state-of-the-art Technology

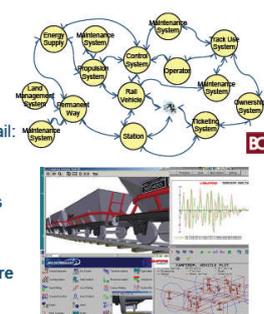
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NR also keeps the system running by implementing relevant investment policies. There is a commitment to have a sustained annual spend on earthworks and an increased annual spend on drainage. Tools have also been developed to measure and monitor asset degradation, so that remediation measures can be taken before it is too late.

NetworkRail

System Resilience

- Rail is one player in UK Transport system
- Rail dependent on Energy, ICT, Road network etc
- Sub-systems' dependencies within Rail:
 - Track v Earthworks
 - Drainage v Signalling track circuits
 - Wheel v Rail etc...
- Aim to understand interactions more



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Prof. Doherty also explained some of NR's plans for the future. One important aspect is that a better understanding of the rail network's interactions with other systems is achieved. These other systems include, for example, energy, road networks and communication systems. NR is also working to

adapt to climate change with an ambitious research program.

John Tesh thanked the speakers for their presentations and gave some concluding remarks. He explained that the Government's approach to risk management is to try to enable better responses when disasters do happen. Britain is regarded as having the best framework in the world for achieving these goals. It is hoped that there will be more engagement with partnerships to help with longer term risk assessment. Mr. Tesh then opened the floor for comment and questions.

The discussion period was opened with some comments from **David Penhallurick** from **Infrastructure UK, HM Treasury**. Mr. Penhallurick thanked the panel for their presentations and commented that some of the main areas being looked at within his organisation involved dependencies, such as the effect of natural hazards on the economy and the ability to respond well to them when they occur. Good responses demonstrate to the rest of the world that the UK is a good place to do business. He also mentioned that when assessing resilience costs, the cost of avoiding the consequences of a natural hazard must be balanced against the cost of recovery. He then asked the panel about what more, in their view, could be done to improve the response to a natural hazard event. The responses from the panellists included better pan-organisation communication, making information clearer and more realistic expectations, i.e. recognising that it is not possible to be impervious to all kinds of weather.

Other questions from the audience included what the methods for obtaining quantitative data on likelihood and consequences of natural hazards were and whether work had been carried out with private companies who specialise in this area. John Tesh explained that most work was currently done solely within government, but that the Blackett review was looking into this possibility.

Paul Thomas then thanked the sponsors for the event, the speakers for their talks, those who had contributed to the discussion and John Tesh for chairing the event. He

remarked that over this and the previous evening event, the audience had been treated to some very good and stimulating presentations with timely topics of current interest. He then invited all attendees to network and continue their discussions over the light refreshments which followed.

Further Contact Details Provided by Contributors:

- John Tesh can be contacted at: [John.Tesh at cabinet-office.x.gsi.gov.uk](mailto:John.Tesh@cabinet-office.x.gsi.gov.uk)
- The Flood Forecasting Centre's contact details are:

Flood Forecasting Centre,
Met Office,
Fitzroy Road,
Exeter
EX1 3PB

Tel: 0300 1234501
Email: [ffcenquiries at environment-agency.gov.uk](mailto:ffcenquiries@environment-agency.gov.uk)
Web: www.ffc-environment-agency.metoffice.gov.uk

- Infrastructure UK's website address, which also lists contact email addresses, is:
http://www.hm-treasury.gov.uk/ppp_infrastructureuk.htm

[Ed. note: ¹ The previous event was reported in Newsletter No. 72, which will shortly be available on the Hazard Forum's website:
<http://www.hazardsforum.org.uk/publications/index.asp>

² The Pitt Review – titled “Learning Lessons from the 2007 Floods” is available for download at:
http://webarchive.nationalarchives.gov.uk/20100807034701/http://archive.cabinetoffice.gov.uk/pittreview/thepittreview/final_report.html

³ For further information regarding the Cabinet Office's work on natural hazards and infrastructure, please see:
<http://www.cabinetoffice.gov.uk/infrastructure-resilience>

Helping the UK Prepare for Hazards

Paul Davies
Head of Hazard Response, Met Office

The UK isn't renowned for its severe weather, but even over the past year we've seen that our climate can pose hazards to public safety. The last 12 months has seen heavy snowfalls, extensive ice and sub-zero temperatures, gusts of wind in excess of 100mph, localised flooding, temperatures high enough to trigger a heat health alert and thick fog – all right here on our doorstep.

Weather like this has the potential to endanger life and cause disruption – the snow last December cost the UK economy up to £130 million a day. Therefore it's essential that people across the country –

from Government to the public – can prepare for what's ahead. As the UK's national weather provider, the Met Office provides a comprehensive range of services to help minimise the impacts of the weather.

We work with contingency planners and emergency responders to make sure they have the very best information available. And our work doesn't stop with the weather forecast. From volcanic eruptions, to outbreaks of foot and mouth, to disruptive waves of solar energy, the Met Office works in more ways than you might

think to provide advice and warnings that help keep the UK safe.

Of course, our [one-to-five day forecasts](#) and [weather warnings](#) are the frontline of what we do. They are delivered to millions of people on television, radio, online, in print, by [iPhone app](#), and on [social media](#). These forecasts are recognised around the world for their [accuracy](#) and that's reflected in times of severe weather – during the [cold weather in December last year](#) the Met Office website received more than 44 million hits during the month.

These forecasts, combined with our 30-day outlook, provide a comprehensive guide to the weather ahead. Because of the unique demands of our customers and some contingency planners, we provide a host of other specially tailored products based on our world-leading weather and climate expertise.

Many are delivered by the Met Office alone, but some are delivered in partnership. For example, the [Flood Forecasting Centre](#), which combines the expertise of the Environment Agency and the Met Office, provides the very best available advice on river and coastal flooding, as well as surface flooding from extreme rainfall. This provides expert guidance for emergency responders and contingency planners.

For those who manage transport networks, we offer [OpenRoad](#) and [Open Runway](#). They give highly detailed guidance on the latest weather developments and how they may affect our road network or airports – playing a vital part in keeping the country moving.

As a world leader in atmospheric modelling, the Met Office also provides services relating to how anything from a chemical spill to a volcanic eruption could be affected by the weather. Fires, for example, can be greatly affected by the weather. [Firemet](#) is a dedicated tool designed to help fire and rescue services identify a safe approach to dealing with a major incident by providing the latest weather information.

Some fires, like the one at the [Buncefield Oil Depot](#) in 2005, can involve hazardous chemicals. In these cases and in other incidents where dangerous chemicals are released into the atmosphere, detailed plume and dispersal modelling can help emergency services focus their efforts. The Met Office's Environment Monitoring and Response Centre (EMARC) operates [CHEMET](#) (chemical meteorology), a service which can quickly provide detailed information.

The same modelling expertise is used in our role as the regional [Volcanic Ash Advisory Centre](#) (VAAC). For example, when the [Grímsvötn volcano in Iceland erupted in May](#) this year, the world turned to the Met Office to advise on where the ash cloud would spread. These advanced dispersal techniques are also used to advise the [Institute for Animal Health](#) in times of disease outbreak, such as [blue tongue or foot and mouth](#).

Radiation incidents are also affected by the weather and the Met Office is on hand to provide information. [PACRAM](#) (Procedures And Communications in the event of a release of Radioactive Material) is a comprehensive service that provides predictions of the trajectory of possible contamination and underpins the emergency response to any potential incident at a UK nuclear power plant. The service allows the nuclear industry and overseeing government bodies to access the atmospheric dispersion predictions which come from our [Met Office Dispersion Model](#).

The national radiation monitoring network and emergency response system ([RIMNET](#)) is managed by the Met Office. It lies at the heart of the National Response Plan developed by the UK Government to ensure that any nuclear emergency could be effectively managed. The plan is a multi departmental and agency response plan, with the [Department for Energy and Climate Change](#) (DECC) as nominated Lead Government Department for overseas nuclear response.

The Met Office now even provides warnings for hazards which originate from beyond the Earth's atmosphere. We work with other organisations to [advise on hazards caused by 'space weather'](#) – namely the radiation impacts from solar flares and 'coronal mass ejections' (a massive burst of solar wind). This involves monitoring the Sun's activity to warn when pulses of energy could impact communications, electrical equipment, or power transmission. An example of this occurred this year in August when the largest geomagnetic storm to affect the UK for many years took place. By warning of potential disruption, UK agencies can prepare contingency plans.

A number of these services can now be accessed from [Hazard Manager](#), a one-stop information source for the emergency response community. It is an interactive web portal using maps which can be overlaid with weather and incident-related information. It allows users to access their services in one location, using a single username and password. "Events" are posted when there is an active incident, essential for keeping cat 1&2 emergency responders up-to-date with the very latest information and developments as they happen.

The Met Office also plays a key role in the Natural Hazard Partnership (NHP). This has been created against a backdrop of serious natural hazard events such as the eruption of the Icelandic volcano in 2010. It aims to integrate and coordinate natural hazard advice and response across Government and currently involves twelve other partners. Sharing information effectively between different partners should enable organisations to provide an early warning of a potential incident, offer a specific technical response to a major incident and provide consistent, coherent information to the wider community.

Anyone wanting to find out more about the Met Office and its hazards work can contact us on the details below:

In writing:

Met Office,
Fitzroy Road,
Exeter,
Devon,
EX1 3PB

Tel: 0870 900 0100

Email: enquiries@metoffice.gov.uk

Web: www.metoffice.gov.uk

All Change for the Safety and Reliability Society

Dr Jacqui Christodoulou



The Safety and Reliability Society recently celebrated thirty years as the professional institution for safety, reliability and engineering risk management practitioners in all industries. The Society also relocated offices during 2010 to new premises, and announced a change of logo.

In a process that included a competition for members to design a logo, the Society's National Council met to make a final decision in January 2011. The Council selected a crisp, clear image to support the clear vision of Value-Engagement-Growth and progressive strategies being adopted by the organisation.

Chief Executive Dr Jacqueline Christodoulou said, 'On the backdrop of a steady yet developing industrial and educational landscape, the Society has chosen to retain the corporate colours, but streamline the image. This reflects our recent move to One Central Park where the organisation can better grow and thrive, yet retain our founding ethos going forward.' The Society has moved premises to take advantage of not only modern offices, but also integral conferencing facilities close to Manchester City Centre. Dr Christodoulou commented: 'Our membership, and the safety and reliability community in general, will benefit from this move, as we will begin to provide more seminars and training opportunities as well as membership services.'

To celebrate the move and to introduce the new premises, the Society held an Open Evening on the 15th September 2011. This also marked the revitalisation of the North West Branch of the Society.

Graham Dalzell, an Honorary Member of the Society, gave a presentation to an audience of over fifty people, including founder members of the Society. The subsequent discussion session set the tone for the coming year of conferences and seminars which will focus on a theme of competence, lessons learned and technical skills in safety and reliability. A programme of regional branch events is available on the Society website, and a full programme of workshops, seminars and an annual conference for 2012 will be announced in January.

In the coming year, the Society aims to partner with other organisations and institutes, including the Hazards Forum, to further develop educational and industry forums on matters pertinent to those interested in safety and reliability and related fields.

For more information about the Society, please see our website at www.sars.org.uk

New Centre for High Integrity Systems Engineering

The new Centre for High Integrity Systems Engineering at the **University of York** has informed the Forum that they have developed a number of short courses to meet the needs of those working in system safety in all industry domains. These short courses offer a comprehensive grounding in the principles of system safety engineering, such as hazard identification, hazard analysis, risk assessment, through life risk management, and system safety justification and certification.

Taught by specialists who have helped to shape some of what is done in system safety today, the courses run regularly throughout the year in manageable one week sessions. Those attending can then use these courses to gain a certified postgraduate award. The courses can also be tailored to individual needs and delivered at a location of choice. To find out more about what is on offer readers are asked to contact Alex King at www.cs.york.ac.uk/chise, telephone 01904 325402 or email postgraduate@cs.york.ac.uk.

From the Secretary.....

The attendance of members at the 2012 AGM planned for the 22nd March will be welcomed. Further information can be seen on Page 12. The next two Evening Events are being planned for Tuesdays 20nd March and 12th June respectively. Brian Neale

Book Review

“Safety Culture - Assessing and Changing the Behaviour of Organisations”
Dr John Taylor, Gower Publishing: Surrey, England

Review by Dick Taylor (no relation!)

Everybody in the safety community is familiar with the term 'safety culture', some can even recall its origins as a term coined by the International Nuclear Safety Advisory Group of the International Atomic Energy Agency following the Chernobyl disaster in an attempt to explore the underlying causes in a deeper way than merely talking about the mistakes made. However, despite the wide use of the term and some previously published approaches to use the concept in a practical way, this book makes a further very valuable contribution in 'pinning down' the concept in an accessible way. It looks at safety culture both in relation to real events and also considers how it can be assessed and changed. This book develops step-by-step, a 'road map' to help clarify thinking and to provide some tools to assess and strengthen safety culture. It is thus a valuable addition to the literature on the subject.

It starts with a discussion of organisational safety-culture theory based strongly on the work of Edgar Schein - working through the meaning and use of his layered approach - linking beliefs, espoused values, attitudes, artefacts and behaviours in understanding business cultures. The book provides examples of these in the context of safety culture, critically discussing them and demonstrates with clear examples, the 'bridge' between largely hidden beliefs and observed behaviours.

In Chapter 2, John Taylor takes the concepts and relates them to six disasters ranging from the loss of the Titanic in 1912, through Bhopal in 1984, to four more recent events in different industries and contexts. He takes the generic model

in the first chapter and shows that it has predictive capability when applied to these 'real' events. The discussion of the events draws out the link between safety-beliefs and observable behaviours in each case. Whilst this may not be a new observation, Taylor's analysis presents the analysis in a clear and compelling way. The events chosen may not all be up-to-date or widely familiar, but they should nonetheless be valuable to those in industry and teaching who wish to relate the 'slippery' concept of safety culture to real events that people will be able to relate to- and understand. The choice of events shows the wide applicability of the concepts.

The last two chapters of the book look at assessing organisational safety culture and the vital issue of improving it. A set of safety-culture characteristics initially developed by the IAEA are used as a basis for a suggested 'sampling process' to assess safety culture. This looks at both safety behaviours and documented expectations and goes on to suggest how the data obtained can be represented pictorially to give context to the findings. Based on the model used by Shell and made more widely available by the Energy Institute, the book offers suggestions for steps that might be taken to achieve and embed improvements in safety culture.

John Taylor draws on his wide experience in the nuclear industry and more widely, to make this a readable and thought-provoking book that should be valuable both to those who have a good knowledge of the subject and are looking for new and critical insights, and those who are trying to make sense of some of the concepts for the first time. It does not provide a comprehensive overview of the subject of

safety culture or the growing literature which has developed and that is not its intention - although there is a good selection of further reading - but concentrates on one approach, developing it in a logical and consistent

way. It is a book which should prove valuable to all who are trying to analyse in a systematic way the deeper-lying safety issues in their organisations, as well as those who are trying to find a compelling way to explain and gain acceptance of the importance of improving safety culture.

HSE eNews

++ ROSPA Occupational Health and Safety Awards 2012 ++

HSE is delighted to support RoSPA's annual Occupational Health and Safety Awards. We share RoSPA's view that competent health and safety advice, along with visible committed safety leadership enables organisations to reduce accidents and ill health in a cost effective way. Deadline for entry submission February 1, 2012.

<http://www.hse.gov.uk/events/rospaaward.htm>

++ Fukushima Report Technical Advisory Panel (TAP) Meeting ++

The summary and agenda of the Fukushima Report Technical Advisory Panel meeting held on 2 September 2011 is now available online.

<http://www.hse.gov.uk/nuclear/fukushima/tap.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 Forum events is by invitation.

Date	Event	Venue	Contact/further information
DECEMBER			
7	IMechE Event, HF Supported: Make Asset Life Extension Work for You	Broadway House, Tothill Street, London, SW1H 9NQ	e_fox@imeche.org ;
2012			
JANUARY			
11	ICE Event: Innovation in Construction	Institution of Civil Engineers, One George Street, Westminster, London, SW1P 3AA	events@ice.org.uk
MARCH			
20	HF Event: A Resilient Transport Infrastructure for a World Event (Working title)	Institution of Civil Engineers, One George Street, Westminster, London, SW1P 3AA	Tim at: admin@hazardsforum.org.uk
20	HF Annual General Meeting 2012	Institution of Civil Engineers, One George Street, Westminster, London, SW1P 3AA	Tim at: admin@hazardsforum.org.uk

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.

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