



Hazards forum



The Hazards Forum Newsletter

Issue No. 71
Summer 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*

June 2011

Hazards Forum AGM 2011

Brian Neale and James Kearns

The Hazards Forum Annual General Meeting was held this year on Tuesday 22nd March at the Institution of Civil Engineers, One Great George Street, Westminster, London, SW1P 3AA, commencing at 16.30 hrs. The meeting was chaired by Hazards Forum chairman, Rear Admiral (retd) Paul Thomas, who welcomed all the attending members.

R/Adm Thomas expressed great sadness at the passing of two former Hazards Forum chairmen, Sir Frederick Warner (in 2010) and early this year, Sir Bernard Crossland.

The Annual Report of the Trustees for the Forum for 2010 was available, as were the notes from the previous year's AGM. R/Adm Thomas explained that, following a review of the Hazards Forum's objectives it had been agreed that they required no change from the previous year, except for one conclusion, which was that the Hazards Forum should remain a Forum, not an expert body. Its purpose should be to provide a platform for debate and to inform members and others.

He continued with a review of changes during the year. In particular, he mentioned Former Hazards Forum chairman Sir David Davies, who had been installed as a Distinguished Member on 22nd September 2010 following retirement from the position of chair at the previous AGM. There had other been changes to the Executive Committee. R/Adm Paul Thomas had been appointed as chairman and John Barber re-appointed as a trustee for a second three-year term, with Dr Jean Venables and himself becoming trustees. Also, Mr Patrick McDonald became the first HSE Observer which complemented the roles of Observers for the Royal Society and Observer for the Royal Academy of Engineering. Also, Dr Chris Elliott retired from his Trustee position on

the committee and during the year Prof. Sue Cox had been appointed as new co-opted member. R/Adm Thomas mentioned that she had recently been appointed an OBE.

The Chairman then discussed the Newsletter, noting the continued positive support it received. It was confirmed that electronic copies of the Newsletter were now being distributed to members as well as continuing with the benefit of a hardcopy format for member organisations. R/Adm Thomas expressed his gratitude to all that had contributed articles. The editor of the Newsletter, James Kearns, was also thanked, having been in the role for just over a year. There had been four evening events held throughout the year, all of which had been successful and well received. Work on developing the Hazards Forum website was also continuing.

R/Adm Thomas then discussed the Hazards Forum financial accounts for the year. There had been some loss in membership this year, which was attributed to the economic downturn. However, there were ongoing efforts to increase membership, which were looking promising for 2011 and that some new members had already joined. Subscription fees had been increased modestly, in line with inflation levels. The accounts could be viewed in the 2010 Annual Report. The independent annual reviewer of the accounts, Alexander Bierrum, had stated that from his review he was satisfied with the accounts. He was duly thanked in his absence. The Chair added to this by thanked all those who had contributed to the work on the Forum in some way during the year, including Brian Neale as Secretary and Tim Fuller and Janet Homer in the Secretariat.

A brief discussion then ensued, in which possibilities of contact with government departments were raised, to which the response was that contact with such departments had increased during the year, resulting in collaboration for future evening events.

The Chairman then mentioned changes to the Executive Committee for 2011. Outgoing trustees were Dick Taylor and Mike Considine, who had completed their terms, and outgoing co-opted members were Brian Wimpenny and Richard Jones. They were duly thanked for their respective contributions. There were two nominations for new trustees for the two vacancies, which meant there was no need for a vote. The two nominees were

Brian Wimpenny and Dave Fargie. R/Adm Thomas then mentioned the two newly vacant co-opted positions and stated that Dick Taylor and Luise Vassie had been nominated. The Chairman then invited the AGM to ratify the nominees and, as there were no objections, congratulated them on their new positions.

In conclusion, Chairman Paul Thomas mentioned that the proposed date for the next Annual General Meeting was Wednesday 20th March 2012. The meeting closed at 17.30 and was followed by refreshments which were in turn followed by the evening event on *Existing Infrastructure – Strategies for Managing Flood Risk*.

Existing Infrastructure – Strategies for Managing Flood Risk

James Kearns

On **Tuesday 22nd March 2011** the Hazards Forum hosted an **evening event**. The event was co-sponsored by the Royal Academy of Engineering, and the Institution of Civil Engineers. The event was held at the latter's premises in Westminster, London.

The event considered the issue of cost effective strategies for managing flood risks that could adversely affect the built environment and in particular the infrastructure that exists at the moment. The event also looked forward to risks that need to be managed for future infrastructure projects as well as those which may be upgraded or refurbished.

The main focus of the event was a recent exercise to test national preparedness to flood risks. The exercise, which was organised by the Environment Agency and had been conducted between 4th to 11th March, was called "Exercise Watermark". The attendees of the evening event were

consequently amongst the first to hear the initial outcomes of this exercise.

The event began with a few brief words from **Hazards Forum Chairman Paul Thomas**, who welcomed the audience and thanked the Royal Academy of Engineering and the Institution of Civil Engineers for co-sponsoring the event. Paul Thomas then welcomed **Hazards Forum Executive Committee member and chair for the evening Dr. Jean Venables**.

In her introduction, **Jean Venables** mentioned the importance of Exercise Watermark in light of recent flooding events in Australia and Japan, and mentioned that it is also essential that the immediate lessons to be learnt from the exercise are picked up in tonight's talks and discussion.

There were two speakers at this event. The first speaker was **Peter Midgley**,

Exercise Watermark Project Executive at the **Environment Agency**, who gave a talk titled “*Exercise Watermark Post Exercise Briefing*”. In this talk, Peter Midgley discussed Exercise Watermark. In particular he discussed the planning process, the exercise itself and the many aspects of the outcomes and conclusions, albeit with only the initial findings. He also discussed his role in the exercise as the principal planner and coordinator at the Environment Agency.

Following this was a presentation by **Sue Whitton, Emergency Planning Officer** at **Lincolnshire County Council**, which had the same title as this event: “*Existing Infrastructure - Strategies for Managing Flood Risk*”. This talk considered Exercise Watermark from the point of view of a participant and also from an organisation that needs to be aware of the flood risk to infrastructure assets of communities.

The talk also described the background to assessing the flood risk to critical infrastructure utilising geographical information systems, and how this work has been incorporated into emergency response plans.

Peter Midgley began his presentation by explaining that Exercise Watermark was a Department for Environment, Fishing and Rural Affairs (DEFRA) led Tier 1 emergency exercise delivered by the Environment Agency. It was the biggest flood preparedness exercise in England and Wales that there has ever been. Exercise Watermark was initiated following the Pitt Review after the summer 2007 floods, which concluded that “A national flooding exercise should take place at the earliest opportunity in order to test the new arrangements which central government departments are putting into place to deal with flooding and infrastructure emergencies”.

The exercise included over 300 organisations and thousands of individual participants, ranging from government departments to local community groups.



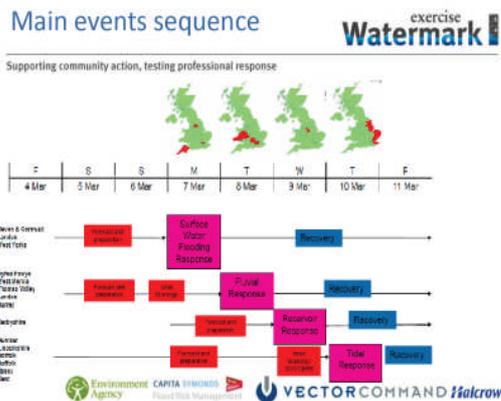
The aim of the exercise was to conduct a wide ranging and publicly engaging exercise that would test the arrangements across England and Wales to respond to all aspects of severe, wide-area flooding. It sought to accomplish this aim by completing a series of objectives that were set at national level and tested down to local level. The objectives were set by the Cabinet Office and DEFRA, and were determined from the Government’s response to the Pitt Review and would be evaluated by centrally trained Primary Umpires. Peter Midgley explained that, to date, all national objectives had now been achieved.



The principles and ethos of Exercise Watermark was that it would be run as a “command post” exercise, rather than as a “tabletop” exercise. This meant that limited information would be given to some players, and other players would have to proactively communicate with the others

to obtain and offer further information, rather than the information being given to each player.

Peter Midgley then discussed the weather scenario which was assumed for the exercise. The hazards were drawn from the National Risk Register, and the impacts were assumed to occur in November 2011 in order to allow for a credible flood-causing weather system to build up. It was assumed that there was a very disappointing wet summer and an early autumn across the country with rainfall well above average. The ground was virtually saturated, and river catchments were filled to near capacity. Players were given access to the assumed weather developments and associated flooding sequences. The exercise practiced a response to a flooding of over 200,000 properties, an evacuation of over half a million people, 135,000 of which needed assisted evacuation. 18,000 people needed sheltering and there were 3,000 casualties and 391 fatalities.



Peter Midgley then described the delivery of the exercise. Play took place from Monday 7th to Thursday 10th March, with build up of scenario material during the days preceding the 7th. The exercise ended on Friday 11th March. Players were encouraged to react to incoming information as they would do during a real incident, and to actively seek additional information to build situational awareness. The Umpires were trained to communicate key exercise management messages from

Exercise Control and to facilitate debriefings at the end of each day's live play. The role of Exercise Control was to manage the delivery of all inject material and all simulated players, and to ensure that real world resource limitations are/were reflected in exercise play.

Success Criteria

exercise
Watermark

Supporting community action, testing professional response

- » Success of the exercise did not have to correlate to the success of the simulated response
- » Scenario purposefully set on the very edge of what the UK might be capable of coping with
- » All players found their organisations to be seriously challenged
- » The exercise succeeded in generating an honest assessment of the UK's flood response arrangements and will enable the wider response community to further improve UK's flood resilience

Environment Agency CAPITA SYMONDS VECTOR COMMAND Halcrow

The evaluation of the exercise was carried out through debriefings, individual valuation forms, a series of reports and a post exercise conference, which would take place later in the year. After this conference there would be a final report and recommendations. The success criteria were in the exercise's ability to generate an honest assessment of the UK's flood response arrangements, rather than in the actual response to the scenario. Peter Midgley said that he felt that an honest assessment had been generated, and that all players had found their organisations to be seriously challenged by the scenario, which had purposefully been set on the very edge of what the UK might be capable of coping with. Although there were some improvements that could be made to the response, it was concluded that Exercise Watermark was an overall success.

Sue Whitton then discussed strategies for managing flood risks to critical infrastructure from a more local perspective. She also discussed how these strategies would be re-examined in light of the Exercise Watermark experience.

Following the Pitt Review of the 2007 summer floods, the Environment Agency

and DEFRA devised guidance on how Local Resilience Forums should develop Multi-Agency Flood Plans, which would help organisations who are involved in responding to a flood to work together better. Sue Whitton presented the response of Lincolnshire County Council to the associated issues. Lincolnshire Resilience Forum decided to include a Multi-Agency Flood Group within its structure in order to complete the Multi-Agency Flood Plan. They had also decided to replace the existing Flood Plan with this guidance. The Forum had decided to employ the services of a consultant through the Environment Agency to chair the group and produce the final plan.

Localism:

- Lincolnshire Resilience Forum (LRF) decided to include in its structure a Multi Agency Flood Group to complete the Multi Agency Flood Plan (MAFP)
- Decided to replace the existing Flood Plan with this guidance.
- Employed the services of a consultant through the local Environment Agency to chair this group and produce the final plan.



Lincolnshire
RESILIENCE FORUM

Some of the key issues requiring consideration and care were how critical infrastructure, vulnerable people and telecommunications would be affected by flooding risks. Also requiring consideration were mass evacuation and shelter plans. To account for these issues a project approach was taken, which involved working with the East Coast Inundation Group, a pan-regional group with the remit to influence national, regional and local policy to mitigate coastal inundation risk, and to co-ordinate planning and share good practice and research.

Work was also done with the Critical Infrastructure Group, which is a Multi-Agency Group consisting of

representatives from government agencies and industrial groups such as utility and telecommunications companies. This group work on the Critical Infrastructure and Essential Services Project (CIES), which aims to identify and understand the resilience of local infrastructure and interdependencies in relation to any individual failure. The objectives of this project are identifying natural hazards that present risks to local infrastructure, defining exactly what constitutes local critical infrastructure, identifying interdependencies between both local and national infrastructure, and to ascertain the degree of impact from failure of the critical infrastructure.

Critical Infrastructure & Essential Services Project (CIES)

Aim:

To fully identify and understand the resilience of the local infrastructure and the interdependencies in relation to any individual asset failure.

Objectives:

- To identify the natural hazards that have the potential to impact on the local infrastructure.
- Define what is local critical infrastructure.
- Identify interdependencies between both local and national infrastructure.
- Ascertain the degree of impact from failure of the critical infrastructure.
- Identify the national critical infrastructure that could impact on the communities of Lincolnshire.

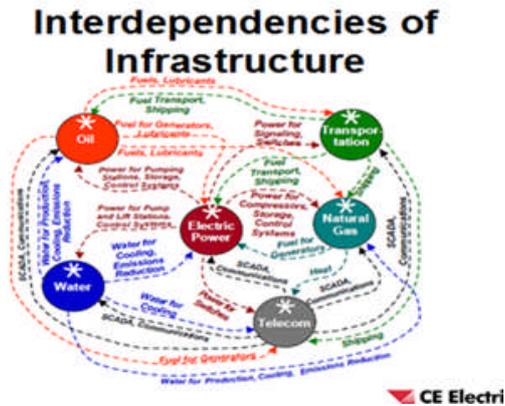


Lincolnshire
RESILIENCE FORUM

A risk assessment was carried out between the Environment Agency, Lincolnshire Police and the Emergency Planning Unit in order to ascertain the likely severity of damage to communities in the event of flooding. This assessment involved the use of Geographical Information Systems, which were also used to identify assets which were potentially vulnerable to flooding.

The issues of interdependencies and criticality were then addressed. One obvious source of interdependency is electricity, which is required by most critical infrastructures. If electricity generation or transmission systems become damaged by flooding, then other systems, such as gas and telecommunications may also be

compromised. Other identified sources of interdependency include copper thefts - which are becoming increasingly problematic fuel and water supplies and transport routes.



The presentation then moved on to discuss the lessons learnt from Exercise Watermark. This exercise had helped clarify a number of matters, such as prioritisation for reconnections in the recovery phase, the resilience of staff, and whether there should be formed a sub-national Critical Infrastructure and Essential Services Group.

Future Flood Risk Management Strategies

Better Communications between Utility Co's
(possible Sub National CIES group – incorporating local knowledge) + direct contact numbers.

Specialist Cell within the Command and Control structure to consider infrastructure implications.

Improve pre-planning – add in scale issues and priority of CNI & local infrastructure

Sharing of relevant information between all responders – theft info shared centrally.

Some conclusions for future flood risk management strategies included better communications between utility companies and direct contact numbers, the formation of a specialist cell within the command and control structure to consider infrastructure implications, and also the ability to share relevant

information between all responders, for example with a central database of theft incidents.

Jean Venables then thanked the speakers for their presentations and remarked that lots of work had clearly been done in understanding and managing flood risks. She then opened the floor for questions.

In the discussion that followed, questions were raised about the results of Exercise Watermark, which appeared to show that many trains would be unable to work, which would make post-flood recovery difficult. To this Peter Midgley replied that he would like to extend the exercise into a full scale recovery operation. The Chair then remarked that many people don't realise that it can be around one year before people are able to move back into their homes following inundation. Other questions were raised about the recovery prospects of critical infrastructure, how such risk management affects decisions for building new infrastructure, and whether resources of the Highway Agency could be used to assist police in evacuation.

Jean Venables then thanked the sponsors of the event, the speakers for their talks and those who had contributed to the discussion. She then invited all attendees to network and continue their discussions over the light refreshments which followed.

[Ed. note: The 2007 summer floods and associated infrastructure resilience issues were the subject of a previous Hazards Forum evening event, details of which can be found in Newsletter No. 61, Winter 2008, available at the Hazards Forum website,

<http://www.hazardsforum.org.uk/publications/index.asp>]

Risk and the Engineering Profession

Judith Hackitt CBE FEng
Chair, Health and Safety Executive



In the 21st Century there can be little doubt that the challenges we face globally require the very best of science, technology and engineering

innovation to address them. And the urgency with which we need to deal with them will mean taking some risks and perhaps making some sacrifices.

The need to find solutions to the present and future challenges should be clear. If the projections are correct and the global population does grow to 9 billion as predicted by 2050 the demands that human kind will be placing on the earth's resources – even the simplest ones: access to clean water; affordable housing, clothing, transport, healthcare and sustainable energy supplies - will be immense. If an ever increasing number of us expect to retain or acquire the freedom to choose and to consume, as many of us in fully developed economies already do, those challenges increase further still.

In spite of, or perhaps because of, this I think there has never been a more exciting and challenging time for any young person to consider becoming a scientist or an engineer. They will be required to innovate and find solutions to new and different challenges from those of the past – but it is also critical that they learn important lessons from the wonderful triumphs and dreadful disasters that have happened before. It is also fundamental that engineers and scientists of the future learn lessons about the need to communicate effectively – not just with

one another – but with the whole of society about some of the risks and unknowns that accompany new technologies and innovations. But perhaps the most important skill of all will be learning to think increasingly in multiple dimensions – to find solutions to problems which do not then in turn create problems in other areas. All of this is part and parcel of the 21st century role of the Engineers and Scientists in relation to risk.

For these reasons, it was a great pleasure to have recently had the opportunity to attend and speak at the launch of the Engineering Council's new publication: *Guidance on Risk for the Engineering Profession*. From design through construction operation and ultimate demolition, when superseded by new technologies, the changing risk profile of whatever is being constructed needs to be identified and the most important risks addressed as far as they can be, even though they may not be eliminated. The guidance provides a timely boost to this principle and should act both as a useful reminder for experienced engineers and a learning tool for new engineers of their professional obligations in this area.

These ideas also translate very easily into the world of health and safety, because they are firmly based on the same sensible principles. As a reminder, the 1974 Health and Safety at Work Act provided a framework of regulation that, rather than being prescriptive, sought to achieve outcomes, not just compliance through rigid rules and procedures. It places the responsibility for managing risk firmly with those that create the risk. In HSE we have come to calling these people duty holders and most of the time this means the owners and directors of

business enterprises. But quite clearly in the case of new technologies and innovation we can apply this principle to those who develop and implement those new solutions. The law does not require risk to be eliminated – but it does require risks to be identified and managed as far as is reasonably practicable.

The non-prescriptive nature of the regulation means that it can be applied to longstanding industrial processes and also to new and emerging technologies. Far from being incompatible with the need for innovation, the principles actually enable innovation to take place as long as the risks are considered and managed along the way and as far as they can be practically and reasonably.

One recent example of this approach being applied to new technology has been the approach HSE has taken to the introduction of new and emerging energy technologies such as renewables, onshore natural gas storage, distributed generation and Carbon Capture and Storage.

CCS presents some particularly interesting challenges and opportunities. Carbon dioxide has been used in a variety of industrial and commercial processes for years. But never before have these processes been brought together on the scale which is now envisaged, in a continual process to capture thousands of tonnes of carbon dioxide from a fossil fuel burning power station and then transported for storage under the sea in deep geological formations. The proposed methodology will produce several interfaces: capture, compression, transport, injection, and intermediate storage. All of these steps need to be properly understood. Having considered the implications of the stages of the process however, we have concluded that there is no need for new or specific legislation for such processes, because we believe the existing framework is flexible enough to cover the whole CCS process. Risks will still need to be properly identified and appropriate control and mitigation measures to be implemented as

the technology comes on-stream. No one would argue that a major release of pure CO₂ into the atmosphere is to be avoided at all costs because in high densities it can act as an asphyxiant.

But there are other factors to consider. One simple but stark illustration of the risk management considerations of dealing with CO₂ relates to the injection into deep sea cavities which will occur from offshore platforms. Traditionally for the oil and gas sectors, emergency escape routes from platforms have always involved going down, into boats onto the surface of the sea as the oil and gas, being lighter than air will go up. But CO₂ is heavier than air. On a calm day a leak from an offshore platform would accumulate on the sea's surface rendering a marine based emergency response impossible.

The future projections for large scale offshore wind farms also present some fascinating challenges. Wind turbines will need to be maintained. Access to the turbines will be by no means simple – helicopter approaches are not possible for obvious reasons and the North Sea's frequently foul weather and high seas brings difficulties for shipping that are well understood.

Far from being arguments against new technologies and innovations, I present these mundane examples to illustrate that we need more innovation not less. But we need that innovation to be able to identify and take into consideration in its design all of the challenges that lie ahead. This must include the unexpected and undesirable consequences.

We need to recognise the hazards and risks that may lie ahead and use those all important innovative skills to find solutions. It is for this reason that we must all consider risk management and innovation as symbiotic.

What the new guidance from the Engineering Council also emphasises – and I wholeheartedly support – is how vital it is for engineers to be committed to communicating about risk and especially their responsibility to contribute to the

public's awareness of what it is and what it might mean. If scientists and engineers believe they can provide the solutions, it is also essential for them to communicate the practicalities of this with others.

Despite all of the technological advances of many decades, scientists and engineers are still not trusted by large tranches of society. This is at least in part the result of a collective failure to communicate effectively. I'm not talking about simply telling people what has been invented or designed. Real communicators listen as well as talk, they understand what is concerning their stakeholders and respond to those concerns. Concerns which may seem irrational are still valid and must be addressed not dismissed. If finding the solutions has never been more important, establishing public trust and confidence in innovation and science is not only important but imperative. For a whole variety of reasons many of us are more risk averse than previous generations. But risk and responsibility go together. If we don't explain that risk is part of all of our lives, all of the time and that there is a risk in doing nothing as well as a risk in taking action; we will not gain support for moving forward.

I believe we need to be clear that risk management and innovation are entirely compatible. We are all familiar with the precautionary principle. In its most generic sense we all utilise it all of the time in our daily lives – weighing up the risks of what we do or are about to do versus the benefits. But in its formal definition and subsequent application there seems to be little doubt that the precautionary principle can often become a barrier to innovation. But the basic facts are these:

- There will nearly always be a threat or risk of harm of some magnitude; and
- there will almost never be full unequivocal scientific knowledge about the situation.

Building public confidence will not come from telling people that “we know best”. What will help to deliver it is:

- acknowledging justifiable fear or apprehension of the new and unknown;
- explaining innovations in terms of benefits and risks;
- being honest about what can be done to reduce but not eliminate risk;
- constantly reminding people that no action is by no means risk free;
- being honest enough to admit when we do not have answers to all of the questions; and
- less talking to ourselves and more real communication and engagement with others in terms that are easily understood, not incomprehensible numbers

Expectations of risk elimination and overuse of the precautionary principle are the enemies of innovation and of sensible risk management. Sustainable solutions which incorporate innovation and risk management are what are needed but time is running short. The work of the Engineering Council is to be commended and I would urge all engineers, whatever stage they are at in their careers, to read it, take it on board and consider whether there is more they can do to apply its principles and new ways in which we can open up our routes to communication with others. Ultimately, the level of understanding and awareness of risk amongst the general population could have a substantial bearing on humankind's ability to meet the challenges to its own ongoing existence and future success. Getting the message across is part of every professional engineer's role.

[Ed. note: More information about the Engineering Council guidance, including the launch, can be seen in the article in this Newsletter on pages 12 and 13.]

Engineering Council Launches Guidance on Risk

Deborah Seddon
Deputy Director of Formation, Engineering Council

At its evening meeting last September, Hazards Forum members heard a presentation by Professor David Bogle, FREng CEng about forthcoming guidance on risk to be published by the Engineering Council. Nearly twenty years ago, the Engineering Council had published a notable document about risk: the Code of Professional Practice on Engineers and Risk Issues. This was a respected and valued document, but it had become outdated.

The Engineering Council's new guidance on risk that Professor Bogle had outlined was published in March, and launched at an event held at University College, London.

Speaking at the launch attended by eighty representatives from across the engineering profession, Judith Hackitt CBE FREng, Chair of HSE, said: "Understanding and managing risk is an essential and integral part of every engineer's role. From design through construction operation and ultimate demolition, when superseded by new technologies, the changing risk profile needs to be identified and the most important risks addressed as far as they can be even though they may not be eliminated".

Judith encouraged engineers to work to build public confidence, noting that this will not come from simply telling people that engineers know best. The approach has to be one of listening, understanding stakeholders' concerns, acknowledging justifiable fear or apprehension of the new and unknown, being honest about what can be done to reduce but not eliminate

risk, and explaining innovations in terms of benefits and risks.

Professor Kel Fidler FREng, CEng, Chairman of the Engineering Council, added that "Risk is inherent in the activities undertaken by professional engineers. Members of the profession therefore have a significant role to play in managing and limiting risk."

The new guidance comprises a set of six principles, each with supporting statements and exemplars, and is published as a downloadable leaflet and a handy wallet card summarising the principles. It aims to guide and motivate professional engineers and technicians in identifying, assessing, managing and communicating about risk. The material is generic and profession-wide, and was developed by bringing together expert thinking from across the profession, as a working group chaired by Professor Bogle. Other individuals and organisations, including members of the Hazards Forum, also provided very useful input during the development of the guidance

Six principles

1. Apply professional and responsible judgement and take a leadership role
2. Adopt a systematic and holistic approach to risk identification, assessment and management
3. Comply with legislation and codes, but be prepared to seek further improvements
4. Ensure good communication with the others involved
5. Ensure that lasting systems for oversight and scrutiny are in place

6. Contribute to public awareness of risk

Each of these six simple but aspirational and interdependent principles is of equal importance.

The guidance is not just for the profession. It also provides a clear statement for the wider community that engineers have a key role to play when dealing with risk and uncertainty, and sets out the engineer's professional responsibility to society, thus contributing to public awareness of risk.

The guidance acknowledges the differing perceptions of risk, the need for a holistic and systems approach, and the importance of effective communication channels, including right through the supply chain. The exercise of professional and responsible judgement and taking a leadership role are of central importance.

The guidance has been welcomed as a milestone in the development of the profession. Since the launch, the Engineering Council has received a steady stream of requests for the materials, and several organisations have decided to circulate the wallet cards widely amongst their membership. You are encouraged to download the guidance document at :

<http://www.engc.org.uk/about-us/guidance-on-risk> and the wallet cards can be obtained from info@engc.org.uk

The Engineering Council is grateful to all who contributed to this important material, including members of the Hazards Forum. The material will be reviewed periodically and comments are welcome, to Deborah Seddon - dseddon@engc.org.uk .

Risk, Engineers and Management

Reg Sell

Past President of The Ergonomics Society
now The Institute of Ergonomics and Human Factors

This paper is intended to be a personal contribution, in a personal capacity, and complementary to the Engineering Council guidance on risk published at the end of March.

Engineers have an important role to play in the management and control of risk. They are crucial in the design stage of a product and a system and also have an important role to play in the operation of systems. There are always going to be risks and they have to be understood and managed. There has to be a balance between health and safety, cost and political factors.

The major responsibility of the engineer is to ensure safe, healthy and efficient

operation and it is this that I am concerned with in this article. There is a great emphasis today on management, incentives and the achievement of targets. It is important that any targets recognise the importance of health and safety.

At the design stage the important factors are ensuring that the physical aspects are covered by ensuring the right materials and reliable products are used and that the risk of future human error is reduced by the application of ergonomic principles.

I was always taught that in times gone by and following the Tay Bridge disaster engineers always over designed their structures etc to avoid the risk of failure. Things are more complicated today and

aspects like cost benefit analysis are important. The problem is that costs are always up front and benefits less tangible and a long way behind. It is also difficult to predict the likelihood of things like human error. In my early career I was contacted by a design engineer who wanted to know whether the extra cost of taking my advice was cost effective. I could only say that the financial cost of one human error would outlay any initial cost.

One of the problems with ensuring good initial design is that those responsible for ordering and commissioning equipment and systems are not those that will have the responsibility of operating it. They all too often see themselves as judged by getting it at the lowest possible cost and on time. Long term safe and efficient operation is not part of their concern. There has to be some form of life time costing and very good communication between the designers and operators/users.

As far as operation is concerned there is a need for engineers to be involved in setting the safety culture for the organisation. The levels of safety culture are obviously dependent on the technology involved and level of risk to life and limb. The retail industry has low

levels and aviation high. In high risk activities who has the power to stop the plant on health and safety grounds? This should obviously be the role of anyone but all too often, the shop floor operator is brain washed into keeping the plant going at all costs. Again, in my early career I was placed in a dangerous position in a steelworks. When I asked the operator why he had not pushed the emergency stop button he said "that the consequent electrical surge would bring the whole of Cardiff to a stop".

Engineers are always likely to be in conflict with people from other disciplines, especially those in finance. Where the power is not with the engineer but he/she feels that the health and safety aspects are paramount the engineer should feel that they have the backing of their professional association behind them and be able to take a stand on the basis of his/her convictions.

Engineers have another role in helping the general public understand better the relative risks when money is available to be spent. For instance, railways are relatively very safe compared with roads yet the public expects more to be done on them to reduce the risk even further.

Dick Taylor Appointment to the HSE Board

Executive Committee member Professor Dick Taylor has been appointed to the Board of the Health and Safety Executive as non-executive director.

Professor Taylor, who is a health and safety risk management specialist, with a particular interest in safety culture, has been appointed for a three year term starting on 1 April 2011, and will represent the interests of professional bodies.

Welcoming his appointment, Professor Taylor said:

"I am delighted to be appointed to the HSE Board. This is a challenging time for health and safety and I want to play my full part in helping the Board to meet those challenges. Throughout my career as a safety professional I have always been impressed by how much people can achieve simply by listening to and learning from one another, and by working together to meet common objectives. I look forward to working with the professional bodies in that same spirit, to help deliver the health and safety improvements we all wish to see."

For more information, see:

<http://www.hse.gov.uk/aboutus/hseboard/biographies/board/taylor.htm>

and:

<http://www.dwp.gov.uk/newsroom/press-releases/2011/mar-2011/dwp035-11.shtml>

From the Secretary ...

As is now customary in the Newsletter following an Annual General Meeting, the lead article is a report of that meeting, including an update about any changes to the Executive Committee. Readers who are not able to attend and who look forward to knowing more about the people involved - and in particular those new to the Committee - will wish to know that this feature is being carried over to the next Newsletter because of the wealth, and currency, of articles published in this edition.

The Hazards Forum is thus pleased to present another extended edition of the Newsletter. This includes a significant article about *Risk and the Engineering Profession* where many ideas are discussed and which is considered essential reading for professional engineers - as well as others in the risk community. This article is complemented by a piece on the launch of the Engineering Council's new guidelines on risk at the end of March, when the views in the aforementioned article were contributed.

Members are reminded of the resource available in the *Calendar of Events* – both on the website and in the Newsletter - to help colleagues in the community become aware of forthcoming events, such as conferences and symposia, that may be of interest.

Brian Neale

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.SciencelnParliament.org.uk

TIME FOR ACTION ON E-WASTE
THE MUSICAL BRAIN
SHALE GAS
100 YEARS OF NUCLEAR PHYSICS
CAN THE ECONOMY SURVIVE WITHOUT
A NATIONAL MEASUREMENT SYSTEM?

Dr Keith Baker
Dr Ellie Dommett
Professor Mike Stephenson
John Roberts

Addresses to the P&SC by Dr Brian S Bowsher,
Dr Roger Digby and Dr Julian H Braybrook

AN EVEN BIGGER BANG IN 2011
BOOK REVIEW: Power "Politics: Political Encounters
in Industry and Engineering" by Francis Tombs
SET FOR BRITAIN 2011
PROJECT SUNSHINE
THE MERSEY GATEWAY BRIDGE
MEDICAL PHYSICS

Reviewed by Robert Freer

Professor Tony Ryan and Professor Peter Horton
Steve Nicholson
Addresses to the P&SC by Dr Stephen Keevil,
Professor Nick Stone, Dr Carl Rowbottom and Dr
Andy Simmons
Tony Hartwell and Louis Brimacombe

STRATEGICALLY IMPORTANT METALS

SHORTAGE OF RARE EARTHS	Professor David Walker
WHY IS HOMEOPATHY SO CONTROVERSIAL?	Dr Peter Fisher
HAS GOVERNMENT FORGOTTEN THE	
“E” AND “T” OF STEM EDUCATION?	Dr Tony Whitehead
WELDING IS FUN, EXCITING AND REWARDING!	Eur Ing Chris Eady
THE INTELLIGENT COLLEGE – STIMULATING THE	
STEM SKILLS SYSTEM	Professor Sa’ad Medhat
DEVELOPMENTS IN THE STANDARDISATION OF	
OCEAN SALINITY	Paul Ridout
SCIENCE AND CITIZENSHIP	The Rt Hon the Lord Jenkin of Roding
HOW THE EU CHEMICAL DIRECTIVE	
CREATED A DARK AGE IN EUROPE	Opinion by Anthony Lipmann
EVOLUTION OF ANIMAL LIFE	
HERPES VIRUS’ TACTICAL MANOEUVRE	
EFFECTIVE PUBLIC DIALOGUE	Suzannah Lansdell
SYNTHETIC BIOLOGY PUBLIC DIALOGUE	Addresses to the P&SC by Dr Brian Johnson, Professor Douglas Kell and Professor David Delpy
	Addresses to the P&SC by Professor Roger Falconer and Michael Norton
IS GLOBAL WATER SECURITY ACHIEVABLE?	Dr Andy Clements
	Catherine Joynson
COLD WINTER IMPACT ON WILDLIFE	Dr Ellie Dommett
DEMAND FOR HUMAN BODILY MATERIAL	Dr Ralph Rayner
AUTISM: A DIFFERENCE OR A DISORDER?	
MARINE RENEWABLE ENERGY	Dr Michael W Elves
SOLAR ENERGY AND FUEL CELLS	Dr Steve Thompson
BUILDING BRIDGES	Karen Smith
TESTING TIMES – NEW IDEAS	Addresses to the P&SC by Professor Molly Stevens, Professor Lionel Tarassenko and Professor John Fisher
THE CODE FOR SUSTAINABLE HOMES	
HOW ENGINEERING PROVIDES BETTER HEALTHCARE	
	Guest of Honour Rt Hon David Willetts MP
ANNUAL LUNCHEON OF THE	Doris-Ann Williams
PARLIAMENTARY AND SCIENTIFIC COMMITTEE	Philip Whiteman
IN VITRO DIAGNOSTICS IN THE NHS	
SEMTA SUPPORTS SCIENCE SKILLS	John Amoore
UN INTERNATIONAL YEAR OF CHEMISTRY 2011	
UNIVERSITY PARTNERSHIPS FOR A BETTER RAILWAY	Michael Norton, Dr Richard Harpin and Alexander Lane
A WATER INFRASTRUCTURE SOLUTION TO	Opinion by Professor Richard Owen
CLIMATE CHANGE	Opinion by Professor Richard Brook
CHALLENGE OF RESPONSIBLE INNOVATION	
TECHNOLOGY AND INNOVATION CENTRES	

HSE eNews – Some Examples

++ Chief Nuclear Inspector Publishes Interim “Lessons Learnt” Report ++

An interim assessment of the implications of the nuclear crisis in Japan concludes there is no need to curtail the operations of nuclear plants in the UK but lessons should be learnt.

The UK’s Chief Inspector of Nuclear Installations, Mike Weightman, recently published a report, requested by the UK Government, in which he calls for action to be taken to learn from events at Fukushima Dai-ichi nuclear power station.

His report identifies 25 recommended areas for review - by either industry, the Government or regulators - to determine if sensible and appropriate measures can further improve safety in the UK nuclear industry. These include reviews of the layout of UK power plants, emergency response arrangements, dealing with prolonged loss of power supplies and the risks associated with flooding.

The 26th recommendation calls for plans to be published by the middle of June detailing how each of these 25 matters will be addressed.

The full, more comprehensive report will be published in September.

<http://www.hse.gov.uk/nuclear/fukushima/interim-report.htm>

++ Deep Water Drilling – Reports Published ++

The Energy and Climate Change Select Committee published the report of its inquiry into deep water drilling and the implications from the Gulf of Mexico incident in April 2010.

The Committee initiated an inquiry to find out about the safety and environmental regulation of oil and gas operations on the UK continental shelf (UKCS) – especially in the deep water areas to the West of the Shetlands. OSD Head, Steve Walker gave evidence to the Committee on 26 October 2010. The full report was published on 6th January 2011.

<http://www.hse.gov.uk/offshore/deepwater-drilling.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 is by invitation.

Date	Event	Venue	Contact/further information
JUNE			
7	IMechE event, HF supported: Safety and Reliability Group Summer Lecture	Institution of Mechanical Engineers, One Birdcage Walk, London	J_parker@imeche.org
14	Hazards Forum Evening Event: Keeping the Country Running: Government's Approach to Infrastructure Resilience	Institution of Civil Engineers, One Great George Street, London, SW1P 3AA	Tim at admin@hazardsforum.org.uk
14	IMechE event, HF supported: ALARP in Practice	Institution of Mechanical Engineers, One Birdcage Walk, London	J_parker@imeche.org
SEPTEMBER			
20	Hazards Forum Evening Event: Critical Infrastructure Resilience (2 of 2)	Institution of Mechanical Engineers, One Birdcage Walk, London	Tim at admin@hazardsforum.org.uk
OCTOBER			
25	IMechE event, HF supported: Process Safety: Avoiding Major Disasters	Institution of Mechanical Engineers, One Birdcage Walk, London	t_khatun@imeche.org
NOVEMBER			
29	Hazards Forum Evening Event: Engineering a Low Carbon Future – Rewards and Risks (provisional)	Institution of Engineering and Technology, Savoy Place, London	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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