

Welcome!

For all your news, views and events

In HFN#98, we present notes from our December event, which considered natural hazards and high-hazard process industries.

There's also our usual news round-up, news from the Executive Committee and a calendar of forthcoming events.

We hope you find HFN#98 interesting and useful. If you have an idea for a short article – or any other comment to make – please get in touch with [Greg Morse](#) at RSSB.

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In the news

Mont Blanc anniversary remembered

6 December saw the 100th anniversary of the [SS Mont Blanc explosion](#) in Halifax Harbour. It was the largest pre-atomic era blast, killing at least 2,000 people and injuring 9,000 more.

Mexichem will not rebuild Mexico facility

It has been [reported](#) that Mexichem will not be rebuilding its vinyl monochloride (VCM) production facility in Mexico. The plant was largely destroyed in an explosion on 20 April 2016 that 32 killed workers.

Toxic cloud in Kansas – report released

The [CSB](#) has recently issued a report following an investigation into a chlorine-based toxic cloud at MGPI Industries, Kansas. The cloud arose from the inadvertent mixing of two chemicals, and resulted in multiple cases of hospitalization and public evacuation.

Three killed in Washington derailment

On 18 December 2017, an Amtrak passenger train derailed near DuPont, Washington, on the inaugural southbound run on a new route built south of Tacoma. Three people on the train were killed. A number of cars on the road were also crushed. Seventy-seven people were taken to hospital for

treatment. An [investigation](#) has been launched. RSSB has also [considered the accident in light of GB rail developments](#).

Gas well explosion in Oklahoma kills 5

On 24 January 2018, a gas well explosion near Quniton, Oklahoma, killed 5 workers. [An initial report](#) released by the Oklahoma Corporation Commission claims that there was an uncontrolled release of gas that caught fire. It also states that an employee had tried in vain to shut down the well. The US Occupational Safety and Health Administration the US Chemical Safety Board are investigating.

US experiences record-breaking year for climate-related disasters

[The US National Oceanic and Atmospheric Administration has reported](#) that the country experienced a record-breaking year of losses caused by weather and climate disasters in 2017, with a cumulative cost in excess of USD 300 billion, and a human toll of 362.

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AGM notice

Next meeting to be held at ICE

The next Hazards Forum Annual General Meeting is planned to be held at the Institution of Civil Engineers on Wednesday 21 March 2018. A formal notice and agenda will follow.

Key business at the meeting will include regular items, like the approval of the annual report and accounts for the year ended 2017. More importantly, we hope to consider (and approve) a new [Hf constitution](#)...

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From the Executive Committee

Events

From 2018 onwards, we're planning to enhance our programme of quarterly events in London, offering high access to high-quality speakers on topical themes and networking with senior professionals, with the addition of some new event formats and event partners. With this in mind, we're looking at a 'Question time' event with the [London Branch of SaRS](#) and an event in Manchester in partnership with the [Institute of Risk and Regulatory Research, University of Manchester](#).

Our events will focus on our three strategic themes, fundamental to the work of the forum:

- Engineered hazards
- Natural hazards
- Responding to hazards

Members and stakeholder feedback

In response to member and stakeholder comments, we'll be focusing on...

- Enhancing the newsletter and providing better access to archived material
- Increasing our social media presence
- Developing a member resource area on the Hazards Forum website
- Diversifying event locations outside of London and widening access to our events

Constitution review

We've carried out a review of how our constitution stacks up against current good practice from the Charity Commission. Working with Withers LLP, a new constitution has been drafted that reflects modern charity governance for an unincorporated charity. As well as bringing us into line with current good practice, the proposed establishment of a Trustee Board and Technical Advisory Committee, provides the opportunity to harness the contribution and expertise of a diverse range of individuals. The trustees will be putting a resolution to the [AGM](#) on this constitution.

Submissions

The Forum is pleased to report that it has made short submissions to the following:

- [Mitigating the risk of infrastructure failures](#) – a review of professional practice in the light of the Grenfell Tower Tragedy: request for submission from ICE members
- [Independent review on building Regulations and fire safety: call for evidence](#)

Logo refresh

We felt the logo needed a refresh, but didn't want to 'throw the baby out with the bath water'. We were pleased to work with Forbes Low of Forbes Design, who came up with several designs, which evolved from the original one and kept to a similar red-blue colour scheme.

The new logo was the preferred choice of the Executive Committee. It's sharper, cleaner and is more in keeping with those of our sponsoring institutions.

2018 Subscriptions due now!

Your 2018 subscriptions notices should be with you. We've maintained the 2018 subscriptions at the 2017 rate. Prompt payment would be appreciated.

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An evening with...

John Munnings-Tomes describes Natural Hazards and the High-Hazard Process Industries, which took place at the IChemE on 7 December 2017

The human impact and tragedy from natural hazards has a near daily presence in the media, and we're largely powerless to where Mother Nature will strike next and with what intensity. But what about our high-hazard process industries and their resilience to natural hazards, where an event has the potential to not only cause facility shutdown, but can also escalate into a major incident where the natural hazard exploits weaknesses to trigger inherent hazard events?



On 7 December, current Hf chair Luise Vassie, presented the Distinguished Membership of the Hazards Forum award to former chair, Rear Admiral (Retd) Paul Thomas CB FREng FCGI CEng FIMechE HonFNucl HonFSaRS.

Honorary Individual Membership was also given to Brian Neale CEng FICE FStructE HonFIDE, the former Executive Secretary of the Forum



The Tōhoku earthquake in 2011 led to a major tsunami with devastating human impact, which in turn triggered a major event at the Fukushima Nuclear Power Plant after emergency systems failed to operate, resulting in multiple release events of radioactive material to the atmosphere. The wild fires in Alberta, Canada in May 2016 not only caused widespread need for human evacuation, but also shut down significant parts of the regions oil sands production activity. More recently (August 2017), Hurricane Harvey caused heavy flooding at a chemical facility which again compromised emergency systems and set off a chain of events that came close to a major accident that could have had far reaching off-site impact.

This Hazards Forum event looked at Natural Hazards in the context of high-hazard process industries from three different but complimentary angles, through the eyes of recognised experts in their field. The evening was chaired by Jon Prichard, Chief Executive of the Institution of Chemical Engineers.

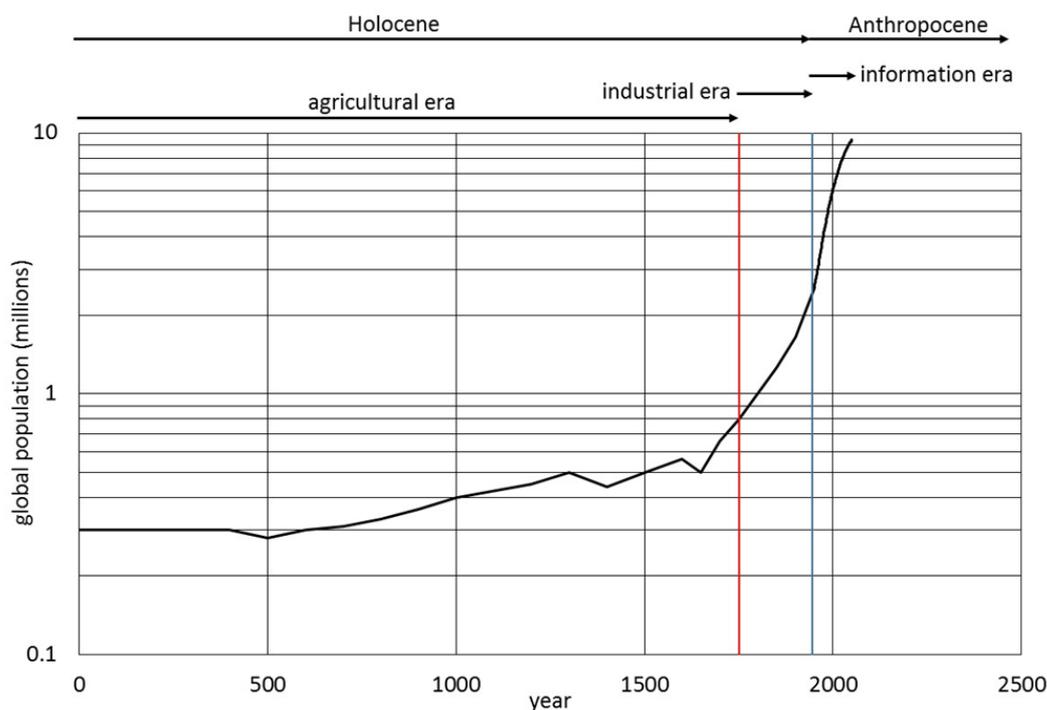
The first speaker was Professor Barry Clarke of [Leeds University](#), and a former President of the ICE. Barry posed the question ‘Are Codes of Practice Keeping Pace with Reality?’ This was asked both in regard to codes of practice and standards in general, and more specifically in regard to natural hazards, and impact on future resilient design.

Barry first identified three key eras that have defined how we use standards:

- Agricultural Era – standards in this era focussed on weights and measures, largely to facilitate local, regional and global trade, and were based on human dimensions. Construction standards were based on precedent, with much trial and error, albeit recognising the need for safety in a fit for purpose design.
- Industrial Era – the onset of urbanisation, and the more widespread use of non-sustainable fossil fuels, driven by constructions standards that were deterministic based on historical data, with scientific method developed from the 17th century, and structural analysis introduced to design in the 19th century. Early in the 20th century, the Engineering Standards Committee was formed in the UK (later to become BSI), with an aim to reduce cost and waste in iron and steel manufacture, recognising the need for both durable and economic design.

Standards ensure products and services are safe, reliable and of good quality, and – for businesses – reduce costs by minimizing waste and errors and increasing productivity. Multiple global standards agencies were formed in this latter part of this period, and the volume of standards has ballooned to what we work with now. Towards the end of the era, bodies such as ASCE and Infrastructure UK began to offer challenge to the sustainability of what to many presents as an overly prescriptive system. The start of this era was defined around 1760, as the “day the world took off”, with 1945 later defined as the “day the world accelerated”.

- Information Era – where we currently find ourselves, with an increased emphasis on renewable sources of energy, and where design criteria needs to be adaptive, resilient and inclusive, and design approach fluid.



In the Information Era, we find ourselves using standards from the Industrial Era, which are largely based on output not performance, and based on historical data, and do not take account of the impact of globalisation on society, changes in technology, and (more specifically in the context of natural hazards) climate change.

In this Information Era, Barry suggested that we will need to look at number of design approach alternatives, including:

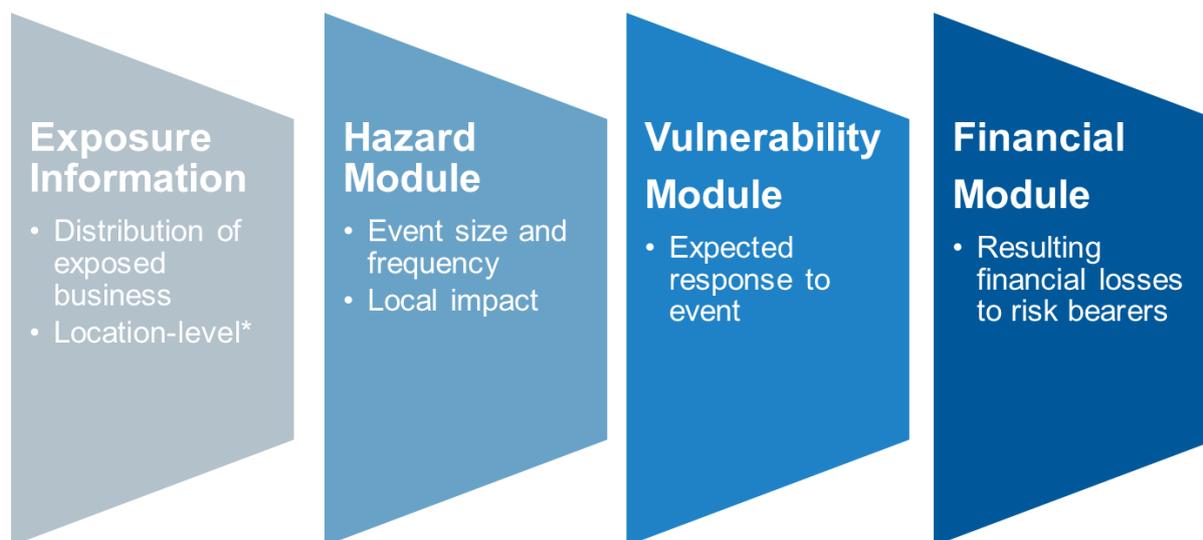
- Business as usual – there will still be a role for existing standards, which will be updated as necessary on a reactive basis
- Design standards revised to set thresholds and upper limits, thus retaining the deterministic approach to design
- Design standards continue and adaption strategy introduced
- Design standards move to a probabilistic approach
- Artificial intelligence introduced to design
- Design standards replaced with engineering judgement, based on underlying scientific principles

In practice, it is likely that a combination of strategies will need to be employed, although an adaptive approach is increasingly needed regarding natural hazards to accommodate impact of climate change over the relatively short life of a dam, offshore platform, piece of industrial equipment, bridge, road, flood defence etc. Barry concluded that the Industrial Era has created an uncertain future that current codes cannot deal with; as such, engineers will need to be willing to be open to alternative future design strategies that tap into the inquisitive engineering mind that has been the cornerstone of engineering evolution.

The second talk provided an insight into Insurance and the Assessment of Catastrophe Risk, ably given by Alistair Nappin, Catastrophe Risk Manager for the [Munich Re Syndicate](#). Alistair started with a short

history of how catastrophe modelling was embraced and developed by the Insurance sector, promoted by large losses sustained by the insurance sector as a result of natural hazard events in the late 1980s in Europe, and Hurricane Andrew in 1992. The aim of such adoption was to allow the Insurer a clearer idea as to the worst case claim impact from a range of natural hazard events across a global book of business, and secondly to determine insurance and reinsurance strategy to adopt.

A typical catastrophe model framework is illustrated below.



Within the Hazard Module, stochastic modelling is used based on historical events, yet allowing modelling of extreme events that may have not been recorded. The Vulnerability Module combines the output of the Hazard Module, with design characteristics of buildings, in turn applying damage ratio criteria to these design characteristics.

Uncertainty, and an understanding of the extent of uncertainty is key to the Catastrophe Modeller to be able to run and interpret a model with confidence, to provide meaningful input to the decision-making process of an Insurance company.

The final talk, given by Pietro Bernardara of the EDF Energy R&D UK Centre, provided a first taste to the end use engineer of an ongoing project with the [Energy Technologies Institute \(ETI\)](#), to develop a set of Natural Hazard best practice design guidelines to be used when developing UK Energy infrastructure. The project whilst targeted at the power generation infrastructure readily lends itself to be used across the high hazard processing industries, including the oil, gas and chemicals sectors.

The ETI has recognised the impact of natural hazard events on large infrastructure projects, and the impact that this has on design decisions where there is an absence of engineering guidelines. In this regard, the project aims to create ETI Guidelines for a future generation of engineers to support optimal design of infrastructure against a range of Natural Hazards.

The project has at its heart a consortium approach, and the final documentation will be made available through IChemE and IMechE platforms. The Natural Hazard Guidelines, with a standard 'architecture' will be written across 10 volumes, as shown overleaf.

Volume	Title	UK Hazards to be captured
1	Extreme weather	Extreme rainfall, wind, tornadoes, snow, humidity, sandstorms
2	Lightning**	Lightning only
3	Hail**	Hail only
4	Extreme air temperature	High and low air temperature, temperatures of rivers, seas, lakes, frazil ice, forest fires
5	Coastal flooding	High tide, extreme sea level, storm surges, wind-generated waves, tsunamis, landslides, meteorite impact, low water levels, sediment transport phenomena
6	River flooding	Flooding due to dam failure, drought, extreme ground water level, sediment transport
7	Space weather**	Geomagnetically induced currents, solar energetic particles
8	Seismic and volcanic hazards	Earthquakes, volcanic ash dispersion, geological instability
9	Biological clogging**	Jellyfish, seaweed, fish
10	Hazard combinations	Hazards occurring close in time/location

Five case studies, representing five representative locations around the UK, have also been generated to illustrate the range of Natural Hazards faced in the UK, and how the engineer might respond to these in a given design.

At the time of the Hazards Forum event, the end of Q3 2018 was offered as the date for final publication of the guidelines, case studies and a conference to create awareness. More information can be found on the [ETI website](#).

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CPD matters

Bristol University risk management course coming soon

The University of Bristol is running a Continuing Professional Development four-day course on Risk Management, which will incorporate some new techniques specific to the institution, but which are applicable to all high-hazard industries.

Underpinning the course is research undertaken by Professor Philip Thomas and his team, which was published in November 2017, and which presented the results of its study into how best to cope with a major nuclear accident. For more information, click [here](#).

The course itself will run from Monday 9 to Thursday 12 April 2018. It's aimed at professionals who need to analyse and manage risk in nuclear and industry environments. Speakers will include academics and senior industry leaders.

For more information and to register an interest, click [here](#).

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Process Safety Management Summit 3

Making good practice common practice

The agenda for [Process Safety Management Summit III](#) – which is being held in Manchester on 18 April – is now live! Expect presentations from industry specialists, expect workshops, expect networking opportunities and more! Topics will include:

- How a positive approach towards excellent safety performance contributes to business performance (Brian Cowell, Generation Managing Director, EDF Energy)
- Seizing the opportunity for change in the management of catastrophic risks (Peter Davidson, Executive Director, Tank Storage Association)
- Understanding why cross-sector learning needs to have a greater presence within industry (Peter Baker, Chief Inspector of Construction, Health and Safety Executive)
- The value of process safety management in delivering infrastructure (Darren James, Managing Director Infrastructure Division, Costain)
- Sustaining strong leadership through a corporate commitment to managing risk (Dr Paul Logan, Head of Chemicals, Explosives and Microbiological Hazards Division, Health and Safety Executive)
- Determining the benefits of process safety investment for good business results and performance (Martyn Lyons, Chief Executive, Inter Terminals)

Hazards 28

ICHEME's annual safety conference is nigh

ICHEME's annual process safety conference, Hazards 28, takes place in Edinburgh, on 15–17 May and is set to provide a comprehensive review into how to reduce the risk of hazardous events. Covering every major aspect of process safety, this leading industry event will share good practice, expert knowledge, latest developments and lessons learned, bringing together process safety practitioners from around the globe. Featuring an extensive technical programme, a trade exhibition, optional workshops, and social and networking opportunities, this is the ideal event for anyone involved in process safety and risk management.



- There will be a packed programme of presentations, sharing the knowledge and experience of around 100 leading experts from around the globe, with contributions from industry, academia and regulatory bodies. Presentations will cover a wide range of process safety themes, including engineering and design, fire and explosions, pipelines, environmental protection, risk management, human factors, fire and gas detection, and ATEX/DSEAR. As well as the oral presentations, there'll be an extensive range of posters to view throughout the conference.

Senior leaders from Nestlé, Wood, AkzoNobel and L'Oréal will deliver keynote presentations on how process safety is being managed within their organisation, and their thoughts on the future. The conference will also welcome guest speaker Vanessa Allen Sutherland, Chairperson of the US Chemical Safety and Hazard Investigation Board (CSB).

- An exhibition will run alongside the conference, showcasing a wide range of products and services to help reduce the risk of hazardous events. The full list of exhibitors is available on the conference website.
- For full conference details and to register to attend, see www.icheme.org/hazards28

Coming up

The [Events](#) section of our website has more information and details of any updates, which may include additional events or amendments to those shown below. Please note that attendance is by invitation.

Date	Event	Venue	Contact/further information
March 2018			
21	Hazards and Procurement	ICE, One Great George Street, London	https://tockify.com/the.hazards.forum/detail/344/1521653400000
21-28	Steam Turbine and Generator User Group 2018	Manchester United Football Ground, Old Trafford, Manchester	http://events.imeche.org/ViewEvent?code=CON6564
April 2018			
18	Power Plant Operations, Maintenance and Flexibility	Hyatt Regency Birmingham, Birmingham	http://events.imeche.org/ViewEvent?code=SEM6624
18	Process Safety Management 3	Renaissance Manchester, Blackfriars St, Manchester	See above.
May 2018			
15-17	Hazards 28	Edinburgh International Conference Centre, Edinburgh	See above.
June 2018			
19	Grenfell a year on: what have we learned?	ICE, One Great George Street, London	https://tockify.com/the.hazards.forum/detail/345/1529425800000

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