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# SHHP

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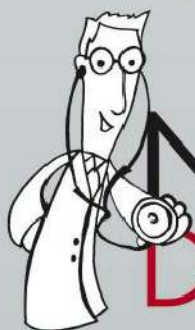
FOOTBALL SAFETY CERTAINLY HAS GREATLY IMPROVED IN THE LAST 25 YEARS BUT THERE'S STILL A LOT MORE TO BE DONE IN TERMS OF CLARIFYING MATCH-DAY HEALTH AND SAFETY RESPONSIBILITIES



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## CONTRIBUTORS

**Philip Bladon**  
*Kick risk to the kerb*



Philip Bladon is senior risk manager – European Operations at insurer QBE. He has more than 16 years’ practical and managerial experience in the mining and metals industries, together with 17 years in the insurance sector, where he specialises in liability risk management, practising primarily in high-hazard industries. He now focuses on QBE’s major client portfolio, supporting clients’ efforts in reducing incidents and the costs associated with resulting claims. Phil is a European engineer, chartered mining engineer, and a chartered member of IOSH.

**Michael Emery**  
*Convert to type*



Michael is the owner of Lancashire-based Securus Health & Safety Limited. He has extensive experience of managing health and safety in a number of leading manufacturing organisations in the UK and abroad, including household names like Portakabin, Rolls-Royce & Bentley Motor Cars, Weetabix, and Almarai in Saudi Arabia.

**Martin Freeman**  
*The bore legacy*



Martin Freeman is MD of Bath-based proptertECO. He has been at the forefront of the radon industry since the early 1990s, when he was the initiator of the industry technical and self-regulatory body, The Radon Council, of which he is currently technical affairs spokesman. Martin has strong personal interest in radon, and has fought for many years for the hazard to receive more attention within government, and among professionals and the general public.

**Neil Budworth**  
*Compare and contrast*



Neil Budworth is the European EHS director for Houghton International, a visiting professor in occupational safety and health at Loughborough University, and a past president of IOSH.

**Richard Byrne**  
*Covert operation*



Richard Byrne has a first-class combined-honours degree in ergonomics and health and safety management, with more than 11 years’ broad health, safety and environmental experience. He is a chartered member of IOSH, a member of IIRSM and an associate member of IEMA. Richard is the route safety improvement manager for Network Rail (LNW).

**Ken Mosley**  
*Safer united*



Ken Mosley is a chartered member of IOSH with a master’s degree in management. He retired after 40 years working in the construction industry in 2009, and now works part-time advising a Championship football club on health, safety and environmental issues.

### REGULAR CONTRIBUTORS

**Michael Appleby**  
*Single-minded pursuit*



Michael is a partner in the London office of law firm Housemans, specialising in health and safety.

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# The bore legacy

Economic and environmental issues are at the heart of the current debate on the merits of ‘fracking’ to extract shale gas for energy. However, there are also potential health and safety repercussions – **Martin Freeman** explores the impact this increased drilling activity could have on radon levels in buildings.

WHILE MOVES TO ENCOURAGE A BOOM IN hydraulic fracturing (fracking) for the exploration of shale gas might make a lot of sense in terms of economic growth and energy provision, there are understandable concerns about the environmental impact and possible unintended health and safety side-effects associated with this intrusive drilling method.

Fracking is a method used to extract oil and gas from shale rock deep beneath the ground. The process involves drilling down through the earth before a high-pressure water mixture is directed at the rock to release the gas inside. The rock is injected with water, sand and various chemicals, which allow the gas to flow out of the well and be collected.

## Growth and security

Shale gas is seen as a valuable prospective fuel source that has the capacity to diminish energy costs for homeowners and industry and reduce dependence on foreign energy supplies, thus benefiting both the economy and national security.

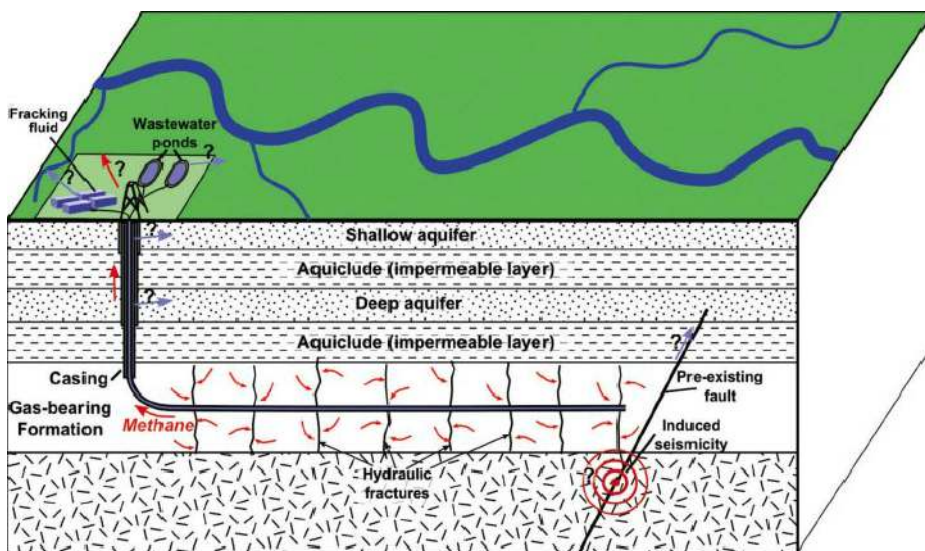
Commenting last year on the potential value of this growing industry, Energy Secretary Ed Davey expressed confidence about its potential: “Shale gas could contribute significantly to our energy security and reduce imports of gas as we move to a low-carbon economy.”<sup>1</sup>

The United States has seen a transformation of its energy costs since going ‘hell for leather’ on shale gas extraction, with unit prices for natural gas in the US down from \$8 in 2008 to \$3. With more than 125,000 “fracks” having been carried out, Americans have seen themselves become more competitive in industries such as chemicals and fertilisers, and have simultaneously cut their CO<sub>2</sub> emissions.<sup>2</sup> Indeed, the US shale-gas revolution was recently described as “the most significant global economic event of the last few years” at the World Economic Forum in Davos.<sup>3</sup>

Closer to home, it looks likely that fracking will become a regular activity in parts of the UK. Planning permission has been obtained for sites in Lancashire, with some works







already having been carried out in Cheshire, Staffordshire, Kent, South Wales, Sussex and Dumfries and Galloway. Further planning applications are being assessed in other parts of the country, including Bath and Somerset.

### Champions and detractors

Fracking involves the hydraulic fracturing of the geology by creating pressure deep underground, and it has been linked to two earth tremors near Blackpool, in 2011. Proponents of fracking point out that these tremors were minor – just 2.3 in magnitude – picked up by instrumental means, and less powerful than tremors that have occurred from the collapse of historic mine workings. They suggest that a new ‘traffic-light’ system of seismic monitoring in micro-wells will avoid risks from tremors and are of the opinion that, as the hydraulic fracturing usually occurs between three and four kilometres underground, there is isolation from impact on the surface.

However, opponents of fracking are raising concerns over potential environmental impacts, such as groundwater contamination. Among a number of unknowns, there is particular concern within health and safety circles that fracking could cause increased levels of radon in buildings, or increase the number of buildings in which dangerous levels of radon are present. These are important considerations because radon is the second-highest cause of lung cancer after smoking, and currently kills around 2000 people in the UK each year.<sup>4</sup>

Detractors generally focus on the method and purpose of the operation: to fracture the geology to release shale gas, which is then substantially captured at a single point, at the annulus of the well deep in the ground. Their concern is that a deliberately created substantial geological disturbance may create pathways for the release of other gases, including radon. Such releases would not

necessarily be collected with the shale gas but will find new pathways to reach the surface. It is suggested that the very depth of the wells and the fracturing may have the effect of producing a ‘cone effect’ of emissions, causing a wider area to be at risk at the surface, the deeper you fracture in certain types of geology.

### What approach should be taken?

The effects of radon are already widely documented and the link between radon exposure and lung cancer deaths is proven.<sup>5</sup> Clearly, the incidence of radon in buildings must be reduced and this is a goal that government departments, regulators and industry are working towards.

The radioactive gas comes from the soil and when it enters buildings it causes a serious health risk if it accumulates to excessive levels. The amount of radon in a building is influenced by a combination of the local geology beneath it and the pathways for the gas. A reasonable person might suppose that deliberate disturbance of geology could result in changes to the local geology beneath buildings in the area of fracking, which could, in turn, cause them to become affected by increased radon emissions. Put simply, if unscientifically: if you shake a fruit tree, you can expect some fruit to fall from it.

The only way to know if a building is affected by radon is to test it (radon cannot be seen, or smelt), so those who are concerned about local fracking causing radon intrusion into their home or workplace should do so before fracking commences.

Regardless of whether or not radon is identified prior to drilling (and whether any remedial work to the property is carried out), repeat testing should be conducted at the property after the fracking has been carried out and the wells have been sunk in the area. If this becomes standard practice, local resident groups could pool their findings to assess the probability of whether the drilling

### THE REGULATORY APPROACH

The HSE recently responded to the *New Statesman*, following its publication of an article called ‘The new gold rush’, which claimed the watchdog lacked onshore expertise and resource to regulate the fracking industry, and not enough inspections were being carried out.

### Steve Walker, of the HSE’s new Energy Division, replied:

“It’s wrong to claim that the HSE does not have the expertise to carry out fracking inspections. The expertise required for the assessment of onshore well integrity is exactly the same as for offshore wells, which our specialists have been doing for years.

It is also nonsense to suggest that HSE has no funds to carry out onshore visits. We have, and we do when it is useful to do so. Wells are deep underground and complex in their construction, most of which is not accessible to visual inspection. The key to well-integrity inspection is to ensure the operator is managing risks effectively from design to decommissioning, which we do for every well by reviewing plans and monitoring well-drilling and construction.

The Government concluded, after considering the Royal Society/Royal Academy of Engineering review of shale gas extraction in the UK, that the established and proven regulatory regime is sufficiently robust.

Very little fracking has taken place in the UK to date. As the industry develops, HSE will, of course, keep its approach under review and continue to work closely with the Environment Agency and DECC to ensure an effective and proportionate system of regulation remains in place.”

activity has created a new problem, or exacerbated an existing one.

### Conclusion

Because radon testing is inexpensive and simple, adopting such a precautionary approach seems to be the best course of action, at least for the present, until sufficient data have been accumulated to define exactly what side-effects, if any, occur. ■

### References

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### Further resources

More information on radon gas can be found on the Health Protection Agency’s website, [www.hpa.org.uk](http://www.hpa.org.uk) or in the World Health Organisation’s Radon Handbook, which is free to download at [http://whqlibdoc.who.int/publications/2009/9789241547673\\_eng.pdf](http://whqlibdoc.who.int/publications/2009/9789241547673_eng.pdf)

**Martin Freeman is managing director at PropertECO – see page 4 for more details**