

2018/2019



magazine

The voice of the HVACR industry

The air we breathe

Tackling the issue of indoor air quality

Fan-tastic career

A detailed look at one man's influence on fan standards

Hot topic

Examining the role heat pumps will play in a greener future

BCIA's got talent

How engineers can play a pivotal role in increasing energy efficiency in commercial buildings



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Letter from the Chairman

Dear FETA members

It's probably safe to say there is never a quiet time to take up the role of FETA Chairman – just as one issue is resolved it's highly likely that another two or three will rear their heads at the same time. Add to that the ongoing Brexit saga and there is a wide range of topics for FETA to tackle at the moment. However, I am not one to duck away from a challenge, so it is with a great sense of responsibility that I took over the reins from my predecessor John Smith, and during my tenure I aim to follow on from the sterling job John carried out.

I must of course touch on the vital industry action following the Grenfell tragedy and commend the contributions that ADCAS and the SCA have made to the relevant Working Groups. FETA supports the findings of Dame Judith Hackitt's report and we remain ready to fully engage with the subsequent building regulatory reforms.

Brexit continues to affect a number of our industries and whatever happens there will still be plenty of complications and negotiations to work our way through during the transitional period until the UK finally exits the EU at the end of 2020. We hope that our work as part of EURIS and with its other members will continue to provide the necessary ongoing support and guidance to deliver a suitable outcome. Refrigeration is one of the many sectors that will require careful handling particularly with regard to standards and regulations. In April 2018 the Environmental Audit Committee (EAC) published its report on "UK Progress on Reducing F-gas emissions", which FETA contributed evidence to, and while we welcomed the government's response, we feel it could have gone much further. Alongside DEFRA and the EA we will continue to push the government to encourage the use of low-GWP refrigerants. FETA's A2L working group has continued its excellent work, including industry workshops, to shine more light on this important topic. Mis-use of A2L refrigerants is still clearly an issue and is clear evidence that more training and guidance is urgently required if we are to achieve immediate and ongoing success.

Away from Brexit there was encouraging progress with the Minimum Energy Efficiency Standard coming into effect in April 2018. This was followed by Prime Minister Theresa May's speech in which she committed the UK to reducing its energy usage by half. 'Bring it on!' is what I would say in response. It is a challenge for us to embrace and one that will enable us to strive to produce the very best technology required to achieve this target. We are perfectly positioned to lead, and guide, the country to a greener future, setting an example for other nations to follow.

MHCLG are due to consult on Approved Document L in the spring of 2019 which will include a move from Carbon to Primary energy factors which potentially may affect SAP calculations when SAP 10.2 is finally implemented.

Along with the publication of Standard Assessment Procedure (SAP) 10, more good news has come in the form of the new SAP 11 and Standard Building Energy Model (SBEM) industry forums set up by BRE in conjunction with Robust Details Ltd. FETA has been actively engaging with BRE in order to ensure improved collaboration between industry and other stakeholders. We are delighted to support the introduction of these forums, and former FETA Chairman Graham Wright has kindly volunteered to spearhead our involvement in the SBEM forum.

In October 2018 it was announced in the UK Budget that the Enhanced Capital Allowance Scheme will be closing, however, manufacturers will still be able to continue listing products on the Energy Technology List. Despite the frustrations we have shared about the cost and bureaucracy involved in the ETL criteria, we are happy to remain positively engaged with ICF and the Carbon Trust on behalf of our members to help complete the criteria revision process.

Finally, I would like to wish all our members a happy new year and a prosperous 2019. As ever, there is an abundance of events throughout the year dedicated to bringing our respective industries together, some of which we have highlighted on page 16, and I look forward to seeing many of you at the FETA Annual Lunch in April.

Nick Howlett
Chairman of FETA



Russell Beattie, FETA Chief Executive, reflects on some of the biggest stories and issues affecting the industry in 2018.

Assessing the impact of Carillion's collapse

The year of course got off to a terrible start in the construction industry with the collapse of Carillion. Carillion, ranked as the second biggest construction company in the UK, and considered one of the government's most important contractors, ran into severe financial difficulties after losing money on large contracts, leading it into a debt of around £1.5bn.

The National Audit Office has estimated that it will cost UK taxpayers £148 million, with wider costs to the economy highly likely. The fallout continues to rumble on and will no doubt do so for a while longer. We will continue to monitor the developments with a keen interest as some of our members have played a key role in pushing through industry reform in construction industry practices that will protect smaller businesses in similar situations in the future.

Supporting the Aldous bill

In April I represented FETA, along with other leading industrial trade bodies such as the ECA, BESA and SEC Group, as we delivered the petition on fair payment and retentions to Prime Minister Theresa May at 10 Downing Street.

The 'Aldous Bill' was introduced by Conservative MP for Waveney Peter Aldous, and after several postponements it is due a second reading on 25th January 2019. The Bill seeks to end payments being withheld for unreasonable lengths of time and end the risk of losing retentions via contractor bankruptcy. Support for the Aldous Bill has increased since it was first introduced to Parliament by Peter Aldous on 9th January under the Ten Minute Rule.

At FETA we will of course continue to support this initiative as retention payments remain a contentious matter for many of our members. The Carillion collapse really brought the matter to the attention of a much wider public audience and we will continue to strive towards a satisfactory conclusion for all parties.

Recognising the importance of indoor air quality

Most of us spend a staggering 80-90% of our lives indoors and in more recent times the impact of a building's internal environment on our health has grown in prominence. The causes and effects of sick building syndrome have been incorporated into studies pertaining to overall 'wellbeing' within the workplace and although this has given rise to a whole new industry addressing our physical and mental health at work, more needs to be done to determine the impact of HVAC systems on indoor air quality (IAQ). The subject of IAQ will pop up later in this magazine, underlining its impact on many of our associations.

The European Ventilation Industry Association (EVIA), in conjunction with seven other European Associations, has been working hard to develop an assessment method for determining the impact ventilation systems have on IAQ – an initiative that has FETA's full support. We hope this will lead to a more recognised metric that stipulates methods of calculation and identifies device characteristics, calibration intervals, tolerances and analyst competences.

Long term approach to safer building design

May saw the publication of Dame Judith Hackitt's final report, 'Building a safer future – Independent Review of Building Regulations and Fire Safety'. Our Smoke Control Association welcomed the recommendations in the report, in particular the recommendation for government to carry out a radical design and content review of the current suite of Approved Documents. We are now more than a year on from the Grenfell tragedy and putting aside the unhelpful political finger pointing, what we can all agree on is that a more thorough and long term approach to safe building design is essential in the future and that aiming for minimum compliance is simply not good enough. It is our aim to continue to assist and advise all relevant parties to deliver building safety and to develop continuous improvements on competency levels.



FETA NEWS



BCIA welcomes Jon Belfield as new President

In May Jon Belfield was appointed the new President of the Building Controls Industry Association (BCIA), taking over the role from Malcolm Anson.

Jon is Managing Director of InTandem Systems Ltd, a controls installation specialist which works on a variety of building controls projects in both private and public sectors. InTandem was the proud winner of the Independent Systems Installer of the Year at the prestigious BCIA Awards in 2016 and also won the CIBSE Employer of the Year at the 2017 Young Engineers Awards. With extensive experience in the building controls sector, Jon is a fellow of CIBSE (FCIBSE) and a Chartered Engineer.



FETA announces leadership changes

The Federation of Environmental Trade Associations (FETA) has announced changes to some of its senior positions, with John Smith standing down as FETA Chairman, and Nick Howlett taking over the role.

Nick, who is also HEVAC President, is Non-Executive Director at Titon and was instrumental in creating the company's mechanical ventilation division in 2005.

With John Smith also stepping down as President of the British Refrigeration Association (BRA), former BRA Vice-President Mark Woods has taken over the role. Mark is Joint Managing Director of Space Engineering Services, having started with the company as a Troubleshooting and Commissioning Engineer in 1997. He is also the Chairman of the BRA Contractor Section and is able to draw on a wealth of practical knowledge and customer relationship experience.



SMOKE CONTROL
ASSOCIATION

SCA welcomes Hackitt Review recommendations

In May 2018 the Smoke Control Association (SCA) welcomed the recommendations in Dame Judith Hackitt's final report, 'Building a safer future – Independent Review of Building Regulations and Fire Safety'.

The SCA supports the recommendation for government to carry out a radical design and content review of the current suite of Approved Documents, that there should be one over-arching Approved Document and that government should engage with industry as a matter of urgency.

The SCA submitted proposals and met with the review team to discuss ways of improving smoke control guidelines within Approved Document B of the Building Regulations. These included:

- More prescription of performance requirements for smoke control installations. The guidance should offer minimum objective based requirements on a sliding scale, depending on the type of building and the risk presented.
- The guidance should have clearly prescribed references to product standards such as the EN12101 suite, so that equipment installed is tested and certified as fit for the purpose intended.

The SCA also welcomed the recommendation for the construction sector and fire safety sector to work more effectively to deliver building safety and to develop continuous improvements on competency levels.



Laughs with Lucy at the 2018 BCIA Awards

Multi award-winning comedian Lucy Porter hosted the 2018 Building Controls Industry Association (BCIA) awards at the Hilton Birmingham Metropole on 10th May.

The awards celebrated the crème de la crème of the building controls sector and recognised outstanding people, products, training and innovation. The award for Outstanding Contribution of the Year was presented to Alan Braybrook of Sontay. Jon Belfield, President of the BCIA, said: "I am delighted to present this award to Alan; he has dedicated his entire working life to the HVAC sector, rising through the ranks to being instrumental in transforming the focus of Sontay onto the international stage." Jon added: "It was a wonderful occasion to celebrate the achievements of the industry's finest. I would like to offer my congratulations to all of the winners and thank all of the sponsors and media partners for their continued support."

All of the winners from the 2018 BCIA awards are listed below:

- Independent Building Controls & BEMS Installer of the Year: Chartwell Controls
- Young Engineer of the Year: Greg Smith of E.ON Control Solutions
- Best Service & Maintenance Provider: E.ON Control Solutions
- Energy Management Award: Portal Building Controls
- Technical Innovation of the Year – Products Award: Global Associates
- Technical Innovation of the Year – Projects Award: Demand Logic
- Contribution to Training Award: One Sightsolutions Ltd

Congratulations to all the winners and we look forward to more exciting products and projects at the 2019 BCIA Awards, which take place on Thursday 9th May 2019 at the Hilton Birmingham Metropole.

HPA welcomes 2018 emission conversion factor figures



In June the Heat Pump Association (HPA) welcomed the latest emission conversion factor figures released by the Department for Business, Energy and Industrial Strategy (BEIS).

The latest data set shows another considerable increase in the use of renewable and low carbon sources for grid electricity – resulting in a 19 per cent reduction in carbon dioxide equivalent (CO₂e) levels since the last set of figures were released.

Emission conversion factors allow CRC Energy Efficiency Scheme participants (large commercial/industrial) to convert the energy they use into tonnes of carbon dioxide. Taxes are then calculated based on yearly emission figures.

The reduction in CO₂e levels is part of an overall trend towards reducing dependency on the grid by utilising low emission technologies such as heat pumps, as well as decreasing coal usage. Heat pumps are leading the way in reducing carbon emissions from space heating and domestic hot water production in buildings and, as this latest set of figures suggests, increased awareness and take-up is now helping to significantly reduce the country's reliance on gas and oil.

"If the government is to hit its targets and reduce emissions by 80 per cent by 2050 then we must continue to push for widespread adoption of renewable technologies and low carbon solutions," said Mike Nankivell, Past President of the HPA. "As an example to highlight the impact a heat pump can make, a ground source heat pump operating at a seasonal performance factor (SPF) of 3.8 will deliver a 63 per cent carbon emissions reduction against a mains gas fired boiler operating at 92 per cent efficiency. When up against an oil based system running at 89 per cent efficiency, the reduction in carbon emissions jumps to 75 per cent."

ADCAS backs long awaited Construction Sector Deal

The Association of Ductwork Contractors and Allied Services (ADCAS) has broadly welcomed the introduction of the government's long overdue Construction Sector Deal – an ambitious £420 million partnership between government and industry that hopes to transform the construction sector through the use of innovative technologies.

The so called 'bytes and mortar' revolution outlined by the government will look to leverage digital design and offsite manufacturing in order to increase productivity and improve quality and safety within the built environment.

It is hoped that this shift will reduce new build delivery times by 50 per cent, allowing for more affordable buildings that fall in line with the Industrial Strategy mission to halve the energy use of new builds by 2030.

Crucially, part of this vision includes a promise of £34 million for training and an increase in the number of apprenticeship starts to 25,000 by 2020. An ageing workforce (one third of the industry's three million workers are over the age of 50) and a national skills shortfall continue to pose problems and without significant investment in training any such move to modernise and develop the industry would almost certainly come up short.

Malcolm Moss, President of ADCAS, commented: "The construction sector is currently facing a number of significant dilemmas, not least how to develop a more sustainable business model, deliver on quality and performance both during the construction and operation of the building, achieve fairer payment practices and upskill the workforce.

"We have yet to see how Brexit will impact upon the industry, but we must have a clear plan in place to ensure that UK construction is moving forwards and is fully focused on meeting current and future challenges. We welcome the introduction of this scheme and the acknowledgement that the current business model is unsustainable and requires major reform."



CBCA highlights role chilled beams can play in indoor air quality



The Chilled Beams and Ceilings Association (CBCA) has urged architects and facilities managers to consider the importance of indoor air quality (IAQ) and future energy cost savings when choosing a heating and air conditioning system for a new building.

The push to make buildings more energy efficient and compliant with the Minimum Energy Efficiency Standard (MEES) is resulting in more airtight buildings and more pollutants being trapped inside. Single or repeated exposure to indoor air pollutants can have both short and long term effects on a building's occupants and this can have negative repercussions on a company's staff. A study in 2015 by Upstate Medical University and Syracuse University, supported by United Technologies, demonstrated that improved indoor environmental quality doubled cognitive function test scores. Allergic reactions, fatigue, headaches and eye irritations are just some of the problems caused by poor IAQ, and businesses could potentially be put off renting an office space if it is likely to have an adverse effect on their staff's production.

Andrew Gaskell, Chairman of the CBCA, said: "A common problem with HVAC systems that take air from ceiling voids is that ceiling voids collect dust and debris, which lowers air quality. This problem can be avoided through the use of active chilled beams as they only induce air from the room and not from the ceiling void. Radiant chilled ceilings and radiant chilled beams can be used with displacement ventilation to achieve better air quality."



Are you following the BCIA on LinkedIn?

The Building Controls Industry Association (BCIA) now has its own Company Page on LinkedIn. This will allow those in the building controls and BEMS sector to be able to share thoughts, news, blogs and event information via the page. The BCIA page also provides an opportunity for like-minded people to network. Make sure you are following the BCIA company page here and share with fellow colleagues who may also benefit from staying informed about the dynamic world of building controls: www.linkedin.com/company/bcia-building-controls-industry

FETA continues to push for more support to reduce F gas emissions

In July 2018 the government published its response to the Environmental Audit Committee (EAC) report on the UK's progress on reducing F gas emissions and also dismissed calls to reform the renewable heat incentive to encourage the use of low GWP refrigerants in heat pumps.

FETA was supportive of the EAC's inquiry, which took a close look at how the challenge of F gas emission reduction in the post-Brexit context should best be dealt with. FETA provided both written and oral evidence

and noted the outcome with great interest. In its report, the EAC asked the government how it would ensure with HMRC that there are no weaknesses in the F gas regime now and after the UK leaves the EU. Russell Beattie, Chief Executive of FETA, commented: "FETA supports the government line that broad adherence with the EU-derived F gas Regulation is the most sensible way forward in the context of Brexit. The application of the F gas quota, applying as it does to companies and not nations, is already a challenging enough prospect and adding extra complexity

by the UK embarking on a different set of rules would be unwise."

UK industry has been proactive in dealing with the issues stemming from the changes brought about by the F gas Regulation and has worked closely with DEFRA and the EA and stands ready to offer further support. FETA would like to see both departments given greater prioritisation for resources by central government. In the interim, FETA will continue to highlight blatant infringements of regulations, particularly by online retailers.



Industry members gather in their hundreds for FETA Annual Lunch

On Thursday 19th April more than 600 manufacturers, suppliers, installers and contractors assembled for the FETA Annual Lunch. With the temperature soaring well over 20°C, professionals from the heating, ventilation, building control, refrigeration and air conditioning industries enjoyed a sumptuous three course meal in The Brewery's Porter Tun Room, before John Smith delivered his Chairman's speech, and special guest Steph McGovern provided some entertainment with stories from her career in broadcasting.

Mr Smith's speech addressed some of the challenges facing the industry, including Brexit, the F gas regulations, smoke control, indoor air quality, and training. Referring to trade related factors post-Brexit, Mr Smith declared FETA's support for the BSI's ambition to stay within the broader European standards system, and its intention to further strengthen its links with the BSI as the UK's transition out of the EU continues.

Following Mr Smith's speech, Steph McGovern took to the stage to

share some anecdotes from some of her most interesting experiences in her career to date. From interviewing Donald Trump to her frequent TV appearances wearing a hi-vis, and discovering a Twitter account dedicated to her eyebrows, Ms McGovern's stories made her a very popular guest, exemplified by the numerous photo requests afterwards, for which she was happy to oblige. As a former winner of the 'Young Engineer for Britain' award, Ms McGovern also highlighted the importance of attracting young people into industry, drawing applause when she said: "We don't value vocational training enough. Someone with an apprenticeship should be valued in the same way as someone with a degree."

The 2019 lunch will take place on 11th April.

Bookings for the 2019 lunch can be made by contacting the event organiser Touchwave Media; 07792 750597, hannah@touchwavemedia.co.uk.



PURR report second edition now available

The updated edition of the PURR report was announced in January 2018 at the HVACR Show, which took place at ExCeL London. The first PURR (Putting into Use Replacement Refrigerants) report was produced in 2015 by members of the British Refrigeration Association (BRA) to help the industry meet some of the key implications and requirements of the EU F gas regulation that came into force on 1st January 2015; in particular the urgent need to move away from high GWP refrigerants, such as R404A.

The second edition of the PURR report has been updated to reflect current market conditions, and contains several new features, including:

- Data on new A2L (low flammability) alternatives for R404A
- Data on R410A alternatives
- General information on the use of A2L refrigerants

This second edition of the PURR report provides greater clarity on alternative refrigerants, which should hopefully assist in ensuring a smooth transition for designers, manufacturers, installers, commissioners and end users to comply with the new enforcements.

The report is available, free of charge, from the BRA section of the FETA website: www.feta.co.uk/associations/bra/publications

Invest in building controls to reduce operational costs



The Building Controls Industry Association (BCIA) has urged the industry to invest in building controls at the design stage of a building in order to lower the overall operating costs in today's commercial buildings.

The 10 80 10 concept represents the total lifetime costs of a building, whereby 10% of the costs of a building is invested at the construction stage; 80% is spent on operating the building and the remaining 10% is accounted for in dismantling and demolition. The majority of

the operational budget is accounted for by the running of building services which includes air conditioning, heating, lighting and ventilation.

A study from the Royal Academy of Engineering showed that for every £1 it costs to build, it will cost £5 to maintain and a further £200 to operate a building during its lifetime. However, too often the £1 spent in the construction phase is squeezed by value engineering and the potential maintenance and operational efficiency benefits are not realised. This is particularly evident with the BEMS where connected points are paired back, metering is removed or commissioning time is cut short.

The latest figures from the BCIA's Market Information Services (MIS) revealed that a new record was set early in 2018 of £654.8 million for the total controls and BEMS market in the UK. This highlights a 0.3% increase in comparison to one year previously and outlines the impact that controls systems have in today's buildings.

Therefore, building managers who utilise effective building controls at the design stage will considerably reduce the running and maintenance costs of a building while increasing energy efficiency and performance.



Dr Bill Cory:
A 'standard bearer' in the fan industry.

A guiding hand

Mike Duggan, Technical Manager at FETA, highlights the role Dr Bill Cory played in the evolution of fan standards over the decades.



The Fan Manufacturers' Association (FMA) has been extremely active over the past few decades in creating and maintaining industry standards. Reliability, value and service, efficiency and safety are some of the most crucial aspects in our industry, and the FMA works hard to encourage consultants, specifiers, installers and manufacturers to harmonise and cooperate to meet global or national standards.

A doctor's advice

One individual who has been instrumental in developing standards in the UK's fan manufacturing industry is Dr William (Bill) Cory. Bill has been what you might call a 'standard bearer' in the fan industry, working for many years as Technical Director of Woods of Colchester (now part of Fläkt Woods). We were honoured to have him as our guest at the FETA Annual Lunch in April as a 'thank you' for his years of dedication to improving industry standards, particularly his involvement in ISO/TC 117, the Fans Technical Committee.

One of Bill Cory's biggest contributions was his calming influence that presided over the development of EN ISO 5801 – widely considered to be the "flagship" standard of ISO/TC 117.

International impact

The development of EN ISO 5801, which covers fan performance tests on standardised test rigs, began way back in 1963 when it was clear that a standard that would be applicable worldwide was needed. The standard would eventually bring together years of research from the world's leading specialists from industry and research organisations. With so many fan performance tests being carried out in different countries, with varying results, this was far from an easy task. In 1997, after some basic agreements were reached on certain core issues, the first International Standard ISO 5801 was completed.

It is important to consider here that the test equipment for large fans in particular can be very expensive, meaning a variety of set-up types from the different national bodies of rules and standards had to be integrated in the standard in order to authorise their acceptance and future application. A German study carried out by the Forschungsvereinigung für Luft-und Trocknungstechnik e.V. (Research association for air and drying technology), Frankfurt am Main, determined and evaluated the comparability of the results of different test rig configurations. The results of this study led to the second issue, ISO 5801:2007, which reduced the number of different methods by deleting those methods that were the least frequently used, and improved the use and application of the standard.

For the third issue, ISO 5801:2017, the contents of the standard were restructured in order to be able to establish all possible set-ups of the used components and define them as standardised test rigs. This helped to build a clearer structure allowing for an easier and safer application of the standard.

Throughout the 1990s Bill was the leader of the UK delegation from the British Standards Institution (BSI) technical committee for fans, MCE/017, and as well as playing a leading role in developing the main fan standard (5801) he contributed to several others on noise (ISO 13347 pts 1 to 4), vibration (ISO 14694) and jet fans (ISO 13350).

Best of British

In 2000, when France gave up the secretariat of ISO/TC 117, Bill made his mark once again by putting forward the case for the Fan Manufacturers Association in FETA taking on the role. Recognising the importance of fan standards to the FMA/FETA members, we have continued with the secretariat to the present and our strong links with the British Standards Institution have gone a long way in setting and maintaining the fan standards we see in place today.

When Bill took over as Chairman of ISO/TC 117 in 2007 he had already recognised the growing importance of energy efficiency and proposed a new fan standard on energy efficiency to support the emerging EU eco-design fan regulations. This has of course gained added importance with the introduction of the Minimum Energy Efficiency Standard.

A simpler marketplace

Industry today demands maximum reliability, value and service. Harmonising and meeting global or national standards, training, links with leading trade associations and industry helping to develop export activity are all areas where the FMA's experience and knowledge are invaluable, and FETA has worked closely with a range of ISO and BSI committees, offering sound and technically unbiased advice to guide committees and set standards.

FETA's work with the BSI aims to bring wider adoption of ISO standards around the world and will go a long way in helping our industry meet the demands of the building practices of the 21st century. Today, FETA has 96 delegates involved with 46 BSI technical committees. Increased membership of BSI, CEN, CENELEC, ISO and IEC committees will bring more manufacturers in alignment together resulting in a much simpler marketplace for the consumer.



Going from strength to strength

Jon Belfield, President of the BCIA, highlights the current strength of the building controls industry and outlines how talented engineers can play a pivotal role in meeting legislation and increasing energy efficiency in commercial buildings.

The building controls industry is both complex and fascinating. Thanks to evolving technology, buildings are becoming smarter and more sophisticated. Currently, there is an increased spotlight on engineering, and this year the Building Controls Industry Association (BCIA) has been in partnership with a government campaign – Year of Engineering 2018. We have been delighted to support this initiative as we want to raise the profile and understanding of what engineering is truly about.

Innovation and emerging technologies will continue to bring challenges, as well as opportunities, and this requires the influx of budding and inquisitive engineers into our industry. Intelligent and effective building controls are a must in the current climate as they improve the comfort and wellbeing of occupants in today's commercial buildings.

What's more, buildings must be energy efficient and sustainable over the long term to ensure government targets are met, especially since the introduction of the Minimum Energy Efficiency Standard (MEES). Therefore, we need to make sure our engineers are highly skilled, confident and able to adapt to legislation.

There are many global challenges in the world today creating a necessity for change and the next generation of engineers have the potential to bring about dramatic change for the future. New and creative engineers will be at the forefront of meeting these challenges, so it really is an exciting time to be entering the world of engineering.

The building controls industry is going from strength to strength and this was clear to see by the fact that we received a record number of entries for the 2018 BCIA Awards. Not only that, but the entries were also of exceptional quality. This underlines that our industry is in safe hands.

Furthermore, it's important that we celebrate the achievements of those who have gone above and beyond in making our industry as successful as we are today. Surely, there is no better promotion than recognising our existing talent pool?

“We need to make sure our engineers are highly skilled, confident and able to adapt to legislation.”

I believe that sharing practices within our sector is also crucial to bringing new ideas to the fore and ensuring that we not only achieve but exceed the energy efficiency targets in commercial buildings.

Like technology, the workplace does not remain static, it moves with the times. The same can be said of people's working habits and behaviours. Our shared training challenge is therefore two-fold; firstly, increasing training opportunities for more engineers to enter our sector to meet demand, and secondly, ensuring that ongoing training is available to keep engineers up to speed with advancements in technology. This will play a significant role in future-proofing commercial buildings which will help to meet legislation and increase energy efficiency.

A career as a building controls engineer is dynamic and creative – with endless opportunities to work on exciting projects which ultimately make a huge difference to people's lives. The pressure is firmly on commercial buildings to be highly energy efficient and meet global targets and our talented problem-solving engineers are able to help make this happen.

My suggestion for the industry would be to continue to work together, share practices and maximise our existing talent. Let's embrace and motivate new talent to join our sector and showcase the range of development opportunities on offer. Ultimately, this type of strategy will continue to ensure that the building controls industry will go from strength to strength for many years to come.



The future of heating



Graham Hazell of the HPA assesses the future of the heating industry and examines the role heat pumps will play in it.

What will our heating systems look like in the future? Hydrogen gas, bio-electric, bio heating oil, fuel cell, carbon capture and storage, or something completely different?

Who truly knows? What we do know is that it is likely to be a mix of technologies, partly due to availability and partly due to the different demands of different buildings such as those currently on the natural gas grid and those not.

The other 'known' is that we are going to have to change, to do things differently, not least because of the warnings that time is running out to get emissions under control and to have any hope of limiting the global temperature rise to 1.5°C¹.

Much will depend on the aspirations of politicians and political parties which in turn will be influenced heavily by public opinion as well as standing within global nations. The public are unlikely to accept huge costs to reduce emissions to near zero even though it is technically feasible. Therefore it would take a huge impetus to significantly reduce the more than 1.2 million gas boilers replaced every year, some very strong will or even stronger legislation than we saw when condensing boilers were mandated.

But there is lower hanging fruit to be had. Firstly, new build developments not close to the gas grid and existing properties off the gas grid. Of course, decisions could be made to extend the grid to new build developments and the hope for existing off grid properties is to develop some kind of bio-heating fuel.

Extending the gas grid

It makes little sense investing in an infrastructure to support a technology which has a medium carbon emission footprint and little ability to significantly reduce emissions in the future when it becomes proportionately a bigger footprint.

Alternatively, these developments could be placed on networks dedicated to hydrogen. However, it is still not determined how the quantities of hydrogen required will be produced. The choice is between steam fusion using mostly fossil fuels or electrolysis using renewable electricity. As attractive as this last option appears there will be much demand for electricity from renewable sources to run our shops, offices and industry. Even if we could satisfy all these needs and had a surplus would it make sense to generate heat on a near 1:1 basis when we could use that electricity to produce heat on a 1:2 or 1:3 ratio using heat pumps?

Whilst heat pumps represent a relatively easy and established technology to reduce carbon emissions, a major sharp shift to solely heat pumps would be impractical - especially in terms of replacing gas central heating. The industry as it presently stands could not cope properly and it could lead to a dramatic increase in poor installations. Also, it is probably naïve to think there will be a mass migration away from natural gas boilers at least in the short to medium term, particularly in the domestic market, especially in view of the 1.2 million replaced each year and an 'in-use' stock circa 25 million! However, that does not mean we should not start the process to replace fuel combustion boiler systems now. Clearly the future of heating in the UK will involve a number of technologies, some established (gas boilers; heat pumps) and some that need development (hydrogen; anaerobic digestion; bio-oil). However, if we are to move to low carbon heating some of the existing technologies will need to expand significantly.

References: 1. BBC News 8th October 2018: Final call to save the world from 'climate catastrophe'

Steel price crisis

“There are no real winners in a volatile steel market but contractors are perhaps more vulnerable than most.”

Malcolm Moss, President of ADCAS, explains why the UK is teetering on the brink of another full-blown steel crisis and outlines what it means for the construction industry.

Just two years on from the near devastating events of 2015/16, the UK steel industry looks to be sailing headlong into another perfect storm – one that could prove fatal for thousands of UK businesses that require a steady flow of high quality and fairly priced steel in order to keep production lines running.

Britain's steel industry, already a shadow of its former self, had shown signs of recovery following the mass closures and mothballing of plants back in 2015 but the dumping of cheap Chinese steel on the EU market and the introduction of US trade tariffs seems certain to bring about another prolonged period of instability.

Although anti-dumping duties are now firmly in place, the flow of Chinese steel into Europe is likely to accelerate as product that was initially earmarked for the US market is instead pushed towards the continent. As the world's largest steel producer, responsible for over half of the global 1.6 billion tonnes produced every year, China will be hit hardest by US tariffs and there is genuine concern that the knock-on effect will be felt across Europe.

The remaining UK based plants are neither willing nor able to provide the steel quantities or variants required by UK industry, leaving many organisations with little choice but to source the vital commodity from overseas territories. The issue is further compounded by the fact that other steel producing nations such as India, South Korea and Vietnam are unable to guarantee a consistent supply line, forcing purchasers to bring in smaller amounts from a raft of independent sources.

Worldwide demand for steel remains high and between May 2017 and December 2017 global

prices increased by almost 100 per cent. An influx of cheap Chinese steel may force inflated prices down, but quality and availability of specialist forms of steel will remain a major issue for a lot of UK firms – for example, 275g coated steel is almost exclusively desired by the UK construction industry but is not viewed as a commercially viable line by UK producers.

There are no real winners in a volatile steel market but contractors are perhaps more vulnerable than most. Original project costings are calculated with a certain price in mind, possibly with a percentage buffer to guard against unexpected rises, but when the manufacturer is forced to pay 15 to 25 per cent more in raw materials costs then they have no choice but to pass some of the cost on to the buyer, eroding contractor profit margins and damaging livelihoods.

Feeling the pinch

In a construction industry already feeling the pinch following the collapse of Carillion, seemingly minor changes to the landscape can have a major impact. UK industry relies on high specification steel and the sad reality is that our own plants are now unable to cater to UK market demands, leaving our manufacturers and contractors at the mercy of a wildly unpredictable and politically charged global market.

Without wholesale changes the UK steel industry will continue to fester, unable to satisfy an increasingly exposed domestic market or compete on the world stage. There is no quick fix but over the long term a more focused approach could potentially revive the local market, with efficient, smaller scale production lines providing some much needed stability and shoring up key supply lines for UK construction.

Unless there is a radical change in approach then high volume purchasers from the UK, such as ductwork manufacturers, will struggle to bring in the quality steel they need to satisfy the market, potentially putting current and future projects at risk.

ADCAS
THE VOICE OF THE DUCTWORK INDUSTRY





Fit for purpose

Martyn Cooper, Commercial Manager at FETA, highlights the dangers of charging a system with a refrigerant that it was not originally designed to use.

The building industry as a whole is in a prime position to be one of the standard bearers in promoting greener technology, benefiting the environment for generations to come. Across all of the building sectors new regulations and standards are coming in to play and, just like the motor, lighting or any other industries that have posed a threat to the environment in generations past, the refrigeration and air conditioning industries have had to look at themselves to assess how they can help safeguard the future health of our planet.

The current F gas regulation will ban the use of refrigerants with GWP>2,500 in both new equipment and for servicing from 2020 and this has had a major impact on the commercial refrigeration industry. Organisations such as ourselves have put much effort into getting over the issues surrounding the regulation, such as the publication of the PURR report in September 2015, subsequently updated in January 2018 to reflect market developments over the last two years. An A2L refrigerants working group was set up and a guidance note entitled 'An introduction to A2L refrigerants and their use in Refrigeration, Air Conditioning and Heat Pump applications' was also released.

Compliance with new regulations should never come at the expense of safety. It was therefore of great concern for us to learn of some instances of R410A (classified as A1; non-flammable) being completely removed from an air conditioning system, and the system simply being recharged with R32. Whether this has come about from a lack of awareness or is just a case of companies trying to cut corners for financial reasons, it is a practice that we must work to eliminate immediately.

A2L gases in retrofits

R410A has been used in many types of air conditioning systems in Japan, Europe and the United States since the 1990s, but with its high Global Warming Potential (GWP) of c.2000, some manufacturers are leading the way in moving towards more environmentally friendly products that make use of R32 as a replacement for R410A. Like R410A, R32 is an HFC but with a much lower GWP of 675, and is classified as A2L (low flammability).

It is vital to underline here the fact that refrigerant manufacturers have clearly stated that A2L refrigerants must only be used in systems designed specifically to take into account their flammability characteristics. They are not suitable for retrofit without a full risk assessment and necessary modifications. A system that was originally designed for R410A will not have taken into account the safety factors required when using an A2L refrigerant and could create a significant safety hazard. Systems designed for use with R32 for example will have different pressure switch regimes, altered inverter profiles, and specially designed heat exchangers.

Due to their flammability (albeit low), A2L refrigerants are intended for use in equipment specifically designed for these products and should always be used in accordance with the relevant national and international standards. If in doubt, the manufacturer of the existing system should always be consulted regarding which refrigerants can be used in an air conditioning retrofit.

EN378

The European refrigerant safety standard EN378 specifies the charge size allowable for different applications of flammable gases which ensures they cannot form a flammable atmosphere and hence are safe in use.

Charging an existing system with R32 would leave the system non-compliant with the refrigerant safety standard EN378, leading to the possibility of forming a potentially dangerous environment in a leakage situation. A relatively large charge of an A2L being released by accident into an area that has not been risk assessed for use with this class of refrigerants carries risk from explosion and combustion.

Potential damage and risk of liability

If you replace a refrigerant in a system with a refrigerant that is not specified as suitable in the manufacturer's instructions you are increasing the likelihood of damaging your system. R32 has a higher compressor discharge temperature than R410A, and will increase wear on the compressor, reducing its life significantly. An installer is therefore leaving themselves open to potentially huge personal cost by retrofitting A2L gases into systems that weren't designed for their use because the liability will rest with them if the replacement refrigerant caused any problems or damage to the existing system.

Most air conditioning manufacturers will offer a warranty on their products to cover repairs and replacements when required. Using a refrigerant not specified for the system will render any relevant warranty invalid. It would also mean that the system would no longer be compliant with its original CE marking or the Pressure Equipment Directive specifications, and could have insurance implications.

Positive action

New products and technologies are being developed as quickly as possible to make air conditioning systems more environmentally friendly and we as an industry must take positive action in ensuring the necessary communication, training and skills are in place to implement these systems correctly.

All technicians carrying out work on stationary RACHP systems must hold an F gas handling certificate. This requirement applies both to in house staff and to personnel employed by external contractors.

FETA and ACRIB have been closely involved in the development of Trailblazer apprenticeship schemes for the industry, and much work has gone into incorporating the changes anticipated by the advent of the regulation.

As stated earlier, the F gas regulation is going to have a significant impact on the commercial refrigeration industry, and it's crucial that manufacturers, installers and end users work together and help each other get a grip on their respective responsibilities. Failure to do so will inevitably lead to serious consequences.



The great indoors

Russell Beattie, Chief Executive at FETA, looks at the impact ventilation systems have on indoor air quality and explains why it is time to introduce a clearly defined assessment method.

It is often said that a good football referee is one that is barely noticed during the game. We could apply a similar logic to indoor air quality (IAQ), which refers to the air quality within and around buildings and structures and how it affects the health and wellbeing of building occupants. Whether we are in an office, factory, hospital, supermarket or restaurant, we expect the air we're breathing to be fresh and clean, keeping us healthy and alert. If the indoor air is maintained at an appropriate temperature, filtered and suitably humidified, we are comfortable. If it is not, however, the signs are soon noticeable.

Take the smoking ban for example. We used to think nothing of walking into a pub or restaurant and experiencing the thick aroma of fresh cigarette smoke mixing with the old, stale fumes of the past, with the smell still lingering on our clothes when we got home later. It's worth remembering that smoking indoors was once commonplace in the UK, not just in pubs – many seasoned journalists will hark back to the days of working in busy Fleet Street newsrooms clouded in smoke. We can confidently conclude therefore that IAQ was not particularly high on the agenda when it came to workplace design, compared to its growing significance today. Smoke, however, is not the only factor that can affect IAQ.

Most of us spend a staggering 80-90% of our lives indoors and the common desire to reduce CO2 emissions and build low carbon buildings means that many homes and commercial properties are becoming increasingly airtight. Poor IAQ can be attributed to a diverse range of sources, but the situation is often made worse by pollutants used in building materials, internal furnishings and cleaning products or by actions such as cooking or painting. Unwanted biological invaders such as dust mites, mould and suspended allergens can also impact upon air quality and even pollutants from external sources can ingress through windows, doors or other openings.

Most equipment used in a working environment can have an influence on IAQ, to some extent or another, such as office equipment like computers and printers, factory machines, and even furniture and carpets. In particular, incorrectly specified and installed HVAC equipment can fail to provide sufficient temperature, humidity and fresh air control resulting in poor air quality. In addition, wrongly sited equipment can result in local regions of poor air quality i.e. hot spots, cold spots, unventilated and draughty areas.

Badly maintained HVAC equipment can mean blocked filters or incorrect filters, which can restrict airflow leading to a build up of contaminants due to inadequate flushing. Uncleaned HVAC plant and ducting can harbour bacteria and fungi which can cause a number of illnesses, some potentially fatal. Poorly maintained equipment can also use more power which indirectly produces higher levels of CO2.

FETA has made direct contact with the Ministry for Housing, Communities & Local Government (MHCLG) in an attempt to determine where responsibility for IAQ ultimately rests. The MHCLG's response confirmed that there is no single departmental lead and a number of different government departments and organisations hold a stake and work together to collaborate on the issue – including MHCLG, Public Health England, the Department for Business, Energy & Industrial Strategy (BEIS), the Department for Environment, Food & Rural Affairs (DEFRA), Department for Transport (DfT) and the Health and Safety Executive. The Department for Education also plays a role in relation to ventilation in schools, adding yet further complexity to the picture.

In the UK, Approved Document F contains recommended performance levels for IAQ and further guidance can be found in The Health and Safety at Work Act 1974 and the Health and Safety at Work Regulations 1992, which outline general duties in providing a

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working environment that is both safe and without risk to health.

The 1974 Act does state that workplaces must be adequately ventilated and should draw fresh clean air from an external source in order to achieve this. It is also noted that the ventilation system should remove and dilute warm, humid air and provide air movement, to create a sense of freshness without causing a draught. Unfortunately, this is not enough in terms of accurately assessing performance in ventilation systems.

Addressing this issue, The European Ventilation Industry Association (EVIA), in conjunction with seven other European Associations, has been working hard to develop an assessment method for determining the impact ventilation systems have on IAQ – an initiative that has FETA's full support. It is hoped that this will eventually lead to the introduction of a recognised metric that stipulates methods of calculation and identifies device characteristics, calibration intervals, tolerances and analyst competences. This valuable tool would help to evaluate the true impact of ventilation systems and go a long way in helping to formally recognise and address issues surrounding IAQ.

Raising standards

Dennis Milligan, President of BFCMA, discusses the importance of maintaining standards in the design, installation and testing of chimneys and flues.



The CE mark is now widely recognised as the mandatory approval mark on flue and chimney products but it is only the tip of the proverbial iceberg. It is based on the achievement of exacting product standards that have been developed to give the user confidence that the product is fit for purpose. Specifiers and installers should always look for the standard the product has been measured against when they are considering using it.

The British Flue and Chimney Manufacturers Association (BFCMA) has been at the forefront of developing standards since it was formed.

Matching the flue

The function of a chimney or flue is to discharge the products of combustion into the atmosphere. This, however, is not as straightforward as it may sound. Most chimneys operate under negative pressure, relying on the laws of thermal dynamics to transport the flue's gases up the length of the chimney or flue to the atmosphere. This requires an unimpeded flow path to the top of the flue that maintains the temperature of the gases above the dew point. Chimney and flue standards are there to specify the components that should be used and how they should be used.

Chimneys and flues are required to discharge a variety of combustion gases. Different types of flue will be required to safely handle the different gases. A key feature of the chimney and flue standards is a user-readable classification system that designates the features of the flue components. The features covered include temperature and pressure rating, fire, condensate and corrosion resistance and distance to combustibles. The classification system is known as the CE Designation. With stainless steel components a label showing the classification must go with each flue component, so that its specification can be easily verified.

Product testing

Product testing is the backbone of setting standards. Chimney and flue components are rigorously tested to prove that they can meet the required performance. In addition to this most chimney/flue companies use simulation software to confirm that a system chimney/flue will function as specified.



System flues

Product standards and CE marking apply to both flue components and to system chimneys. It is worth pointing out that a CE mark for a system chimney applies to the complete flue system, including added components like rain caps. The use of components that have not been tested with the flue invalidates the CE mark and turns the flue into a custom flue.

Design and installation guides

In addition to establishing standards the BFCMA has also produced a number of design and installation guides covering wood burning and multi-fuel stoves, biomass appliances and commercial flues. Guides for gas appliances and for concentric chimneys are planned for 2019 to coincide with the publication of new standards.

The design and installation of chimneys and flues in the residential sector is covered by Approved Document J. There is no equivalent document in the commercial sector. To provide much needed guidance the BFCMA published its Commercial Flue Guide. The guide covers chimney principles, regulations, chimney and flue design, chimney/flue height and the Clean Air Act and maintenance. The aim of this guide is to provide a clearer understanding of how chimneys and flues should be selected and installed in commercial applications.

Brexit

The CEN organisation which is responsible for setting European product standards is independent of the European Commission. British Standards Institution (BSI) has confirmed its commitment to continue with European standards and the government has indicated that it plans to continue with the current standards system after Brexit. In light of these commitments the industry can look forward to a stable standards regime. The BFCMA will continue to work on European product standards to ensure that the requirements of the UK chimney and flue industry are met.

Clear on smoke



David Mowatt, Chairman of the SCA, looks at some of the key points to consider when designing and installing a smoke control system within common escape routes in apartment buildings.

The primary objective of any smoke ventilation system is to prevent the spread of smoke through the building and, critically, to keep the staircase clear while occupants evacuate and firefighters enter the building.

When considering a smoke control system in an apartment building it is important to recognise that no matter the system type, it should be part of an overall fire engineering strategy and should not be designed in isolation. The designer should ensure that the proposed system complements the fire safety strategy and provides the necessary levels of protection, in the same way that the architect and fire engineer should ensure that the building layout provided to the designer is entirely accurate and up to date.

Before putting forward any design proposals, designers should also consider requirements contained within the Building Regulations, the Construction (Design and Management) Regulations, the Workplace (Health, Safety and Welfare) Regulations, the Regulatory Reform (Fire Safety) Order and any other relevant legislation. Consultation with the regulatory authorities may assist in achieving an appropriate design. Where smoke control systems interact with other systems any interaction in a fire situation should not compromise the operation and effectiveness of the smoke control system.

Overall performance criteria and system design will vary depending on the layout of the common corridor or lobby with the apartment building. Where travel distances are no more than 7.5m in distance from the door to the staircase along to the more remote apartment entrance door, the principle objective will be to ensure that the stairway(s) remain predominantly free of smoke. However, where corridors are extended, both the staircase and the common corridor will require protection. A smoke control system should be installed and commissioned in accordance with a detailed engineering plan which should have considered as a minimum:

Methods of smoke control

There are three common methods used to limit the spread of smoke in the common areas of apartment buildings: Natural smoke control systems; Mechanical smoke ventilation systems; and Pressure differential systems.

Small single stair buildings require their own system type since the functional requirements for the systems, whether natural, pressurisation or powered are slightly different to other residential building types.

Natural ventilation

Natural ventilation has many benefits including simplicity, reliability, low noise and low energy use. However, its performance can be sensitive to wind effects and, for natural shaft systems, there is a relatively large loss of floor space.

Natural ventilation works by harnessing the natural forces of wind and thermal buoyancy to drive flow through the ventilator. For this application, the intended driving force is the buoyancy of hot smoke from the fire. Since buoyancy forces can be small compared to wind forces the performance in use can be significantly affected by wind.

For natural ventilation to operate effectively there needs to be both a source of inlet air and an exhaust opening. For a wall mounted vent, the vent generally provides both inlet at the bottom of the vent and exhaust at the top. Otherwise inlet air can be provided through the stair door when it is opened. To assist this, and to vent any smoke which enters the stair, a vent is needed at the head of the stair.

Mechanical smoke ventilation

Mechanical smoke ventilation may be used as an alternative to natural ventilation systems. Benefits of mechanical systems include specified extraction rates, low wind sensitivity, known capability to overcome system resistances and reduced shaft cross sections. Requirements of mechanical systems include a maintained power supply, fire resisting wiring, temperature classified equipment and a standby fan.

Suitable air inlet and exhaust is needed to prevent damage to the system and to ensure that excessive pressurisation or depressurisation of the ventilated area does not occur.

This ensures that excess smoke is not drawn from the apartment of fire origin and that escape doors are neither rendered inoperable nor pulled open.

Design should be based on a single floor level being affected by the fire and therefore only the smoke vents on the floor of fire origin and any other design critical vents (such as the head of the smoke shafts and staircase) are required to open. System designers should avoid opening ventilators on multiple floor levels, especially where connected by a smoke shaft, to avoid smoke spread to otherwise unaffected parts of the building, and/or reduction of extract rate from the floor of fire origin.

Pressure differential systems

It is generally recognised that pressure differential systems can provide a high level of protection to stairs and lobbies.

The aim of a pressure differential system is to establish a pressure gradient (and thus an airflow pattern) with the protected escape stair at the highest pressure and the pressure progressively decreasing through lobbies and corridors.

With the correct level of pressure differential, it is possible to be certain that smoke from a typical apartment fire will not enter the stair under normal conditions.

Air will naturally try to move from an area of higher pressure to an area of lower pressure. By increasing the pressure in the protected areas (i.e. the escape routes) above that in the areas where the fire is likely to occur (in this case the apartments), it is possible to prevent smoke spreading into these escape routes. This is usually achieved by pressurising the parts of the escape route to be protected.

Escape routes

In the event of an apartment fire, the build up of toxic smoke can reduce visibility, cause disorientation and eventually overcome occupants long before the fire itself becomes life threatening. Unless smoke is controlled and properly ventilated, escape routes can become inaccessible – both for occupants trying to escape and for firefighters entering the building. A robust smoke control system which has been properly designed, installed and maintained can ultimately save lives when incorporated into a wider fire engineering strategy.

You can now follow the SCA on Twitter @SmokeContAssoc and LinkedIn www.linkedin.com/company/smoke-control-association/



The FETA network

FETA is a federation of trade associations representing ADCAS, BCIA, BFCMA, BRA, HEVAC and HPA but it also has close ties with many other associated groups and industry bodies.

ACRIB	UK Air Conditioning and Refrigeration Industry Board
AMCA	Air Movement and Control Association International
AREA	Air Conditioning and Refrigeration European Association
AHRI	Air Conditioning, Heating and Refrigeration Institute (US)
BEIS	(Department for) Business, Energy & Industrial Strategy
BESA	Building Engineering Services Association
BSRIA	Building Services Research and Information Association
Build UK	A construction industry alliance
CBI	Confederation of British Industry
CT	Carbon Trust
EPHA	European Heat Pump Association
EPEE	European Partnership for Energy and the Environment
EST	Energy Savings Trust
EVIA	European Ventilation Industry Association
IoR	Institute of Refrigeration
MHCLG	Ministry for Housing, Communities and Local Government
SOJACES	FETA/BSRIA/CIBSE/ECA/BESA
TA Forum	Trade Association Forum

Meet the board

The FETA board comprises senior officers of all six Associations.

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Diary dates

- 12-16 January **ASHRAE, Atlanta, USA**
- 6-7 February **Energy Now Expo, Telford, UK**
- 12 February **CIBSE Building Performance Awards 2019, Grosvenor House Hotel, London**
- 21 February **IoR Annual Dinner, The Grange, St. Paul's Hotel, London**
- 5-7 March **Futurebuild, ExCel, London**
- 11 April **FETA Annual Lunch, The Brewery, London**
- 25 April **H&V News Awards, London**
- 8-10 October **UK Construction Week, NEC Birmingham**